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Report No: PAD5346

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT PAPER

ON A

PROPOSED ADDITIONAL LOAN

IN THE AMOUNT OF EUR 37 MILLION (US\$40.53 MILLION EQUIVALENT)

TO

BOSNIA AND HERZEGOVINA

FOR THE

First Phase of Sava and Drina Rivers Corridors Integrated Development Program
using the Multiphase Programmatic Approach

June 30, 2023

Water Global Practice
Europe And Central Asia Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective April 30, 2023)

Currency Unit = EUR

EUR .9105 = US\$1

US\$1.10 = EUR 1

FISCAL YEAR

January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

| | |
|-------|---|
| ADM | Accountability and Decision Making |
| AF | Additional Financing |
| APA | Alternate Procurement Arrangements |
| BAM | BiH Convertible Mark |
| B/C | Benefit to Cost |
| BD | Brcko District |
| BHMAC | Bosnia and Herzegovina Mine Action Center |
| BIH | Bosnia and Herzegovina |
| CERC | Contingent Emergency Response Component |
| CHF | Swiss Franc |
| CPF | Country Partnership Framework |
| DB | District Brcko |
| CY | Calendar Year |
| EC | European Commission |
| ECCWB | Europe Western Balkans Country Unit |
| EEG2 | Equitable Growth, Finance and Institutions (EFI)-ECA-Governance (GOV)-2 |
| ERR | Economic Rate of Return |
| EECRU | Equity, Finance and Institution - Europe and Central Asia Procurement |
| ESF | Environmental and Social Framework |
| ESS | Environmental and Social Standards |
| ESMF | Environmental and Social Management Framework |
| ESMP | Environmental and Social Management Plan |
| E&S | Environment and Social |
| ESRS | Environmental and Social Review Summary |
| EUR | Euro |
| FBIH | Federation of Bosnia and Herzegovina |
| FM | Financial Management |
| FY | Fiscal Year |
| GCRF | Global Crisis Response Framework |
| GEF | Global Environmental Facility |
| IBRD | International Bank for Reconstruction and Development |
| IDA | International Development Association |
| IPF | Investment Project Financing |
| ISR | Implementation Status and Results |
| ISRBC | International Sava River Basin Commission |
| LMP | Labor Management Plan |
| MPA | Multiphase Programmatic Approach |
| NDC | Nationally Determined Contribution |
| NPV | Net Present Value |
| O&M | Operation and maintenance |
| OP | Operational Policy |
| PAD | Project Appraisal Document |
| PDO | Program Development Objective |
| PIU | Project Implementation Unit |

| | |
|------|--|
| PMU | Project Management Unit |
| POM | Project Operational Manual |
| PPSD | Project Procurement Strategy for Development |
| PRDO | Program Development Objective |
| RDF | refuse-derived fuel |
| RPF | Resettlement Policy Framework |
| RS | Republika Srpska |
| SDIP | Sava and Drina Rivers Corridors Integrated Development Program |
| SEP | Stakeholder Engagement Plan |
| SOE | Statement of Expenditures |
| SOPs | Standard Operating Procedures |
| SMEs | Small and Medium Enterprises |
| STEP | Systematic Tracking of Exchanges in Procurement |
| TOR | Terms of Reference |
| WBIF | Western Balkans Investment Framework |

Western Balkans

Sava and Drina Rivers Corridors Integrated Development Program Additional Financing

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**BASIC INFORMATION – PARENT (Sava and Drina Rivers Corridors Integrated Development Program - P168862)**

| | | | | |
|-----------------|------------------------------|----------------|--------------|----------------------|
| Country | Product Line | Team Leader(s) | | |
| Western Balkans | IBRD/IDA | IGOR PALANDZIC | | |
| Project ID | Financing Instrument | Resp CC | Req CC | Practice Area (Lead) |
| P168862 | Investment Project Financing | SCAWA (9392) | ECCWB (7001) | Water |

Implementing Agency: FBiH Ministry of Agriculture, Water Management and Forestry, Montenegro Ministry of Agriculture and Rural Development, Republic of Serbia Ministry of Construction, Transport and Infrastructure, International Sava River Basin Commission, Republika Srpska Ministry of Agriculture, Forestry and Water, Brčko District, Republic of Serbia Ministry of Agriculture, Forestry and Water Management

| | |
|--------------------------------------|---|
| Is this a regionally tagged project? | Country (ies) |
| Yes | Bosnia and Herzegovina, Croatia, Montenegro, Slovenia, Serbia |

| |
|------------------------|
| Bank/IFC Collaboration |
| No |

| | | | |
|---------------|--------------|------------------------------------|--|
| Approval Date | Closing Date | Expected Guarantee Expiration Date | Environmental and Social Risk Classification |
| 06-Aug-2020 | 30-Jul-2026 | | High |

Financing & Implementation Modalities

| | |
|--|---|
| <input checked="" type="checkbox"/> Multiphase Programmatic Approach [MPA] | <input type="checkbox"/> Contingent Emergency Response Component (CERC) |
| <input type="checkbox"/> Series of Projects (SOP) | <input type="checkbox"/> Fragile State(s) |
| <input type="checkbox"/> Performance-Based Conditions (PBCs) | <input type="checkbox"/> Small State(s) |
| <input type="checkbox"/> Financial Intermediaries (FI) | <input type="checkbox"/> Fragile within a Non-fragile Country |
| <input type="checkbox"/> Project-Based Guarantee | <input type="checkbox"/> Conflict |
| <input type="checkbox"/> Deferred Drawdown | <input type="checkbox"/> Responding to Natural or Man-made disaster |



[] Alternate Procurement Arrangements (APA)

[] Hands-on Expanded Implementation Support (HEIS)

Development Objective(s)

MPA Program Development Objective (PrDO)

The objective of the Program is to strengthen transboundary water cooperation and improve navigability and flood protection in the Sava and Drina Rivers Corridors.

Project Development Objectives (Phase 001)

The Objective of the Project (Phase I of the Program) is to improve flood protection and enhance transboundary water cooperation in the Sava and Drina Rivers Corridors.

Ratings (from Parent ISR)

| | Implementation | | | | | Latest ISR |
|--------------------------------------|----------------|-------------|-------------|-------------|-------------|-------------|
| | 19-Sep-2020 | 26-Apr-2021 | 15-Nov-2021 | 19-May-2022 | 15-Nov-2022 | 14-Feb-2023 |
| Progress towards achievement of PDO | S | S | S | S | S | S |
| Overall Implementation Progress (IP) | S | S | MS | MS | MS | MS |
| Overall ESS Performance | S | S | S | S | S | S |
| Overall Risk | H | H | H | H | H | H |
| Financial Management | S | S | S | S | S | S |
| Project Management | S | S | MS | MS | MS | MS |
| Procurement | S | S | MS | MS | MS | MS |
| Monitoring and Evaluation | S | S | S | S | S | S |

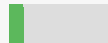
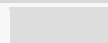
**BASIC INFORMATION – ADDITIONAL FINANCING (Sava and Drina Rivers Corridors Integrated Development Program Additional Financing - P180507)**

| | | | |
|--|---|--|---|
| Project ID P180507 | Project Name Sava and Drina Rivers Corridors Integrated Development Program Additional Financing | Additional Financing Type Scale Up | Urgent Need or Capacity Constraints No |
| Financing instrument Investment Project Financing | Product line IBRD/IDA | Approval Date 25-Jul-2023 | |
| Projected Date of Full Disbursement 30-Mar-2028 | Bank/IFC Collaboration No | | |
| Is this a regionally tagged project? Yes | | Country (ies) Bosnia and Herzegovina, Croatia, Montenegro, Slovenia, Serbia | |

Financing & Implementation Modalities

| | |
|--|---|
| <input checked="" type="checkbox"/> Multiphase Programmatic Approach (MPA) | <input type="checkbox"/> Series of Projects (SOP) |
| <input type="checkbox"/> Fragile State(s) | <input type="checkbox"/> Performance-Based Conditions (PBCs) |
| <input type="checkbox"/> Small State(s) | <input type="checkbox"/> Financial Intermediaries (FI) |
| <input type="checkbox"/> Fragile within a Non-fragile Country | <input type="checkbox"/> Project-Based Guarantee |
| <input type="checkbox"/> Conflict | <input type="checkbox"/> Responding to Natural or Man-made disaster |
| <input type="checkbox"/> Alternate Procurement Arrangements (APA) | <input type="checkbox"/> Hands-on, Enhanced Implementation Support (HEIS) |
| <input type="checkbox"/> Contingent Emergency Response Component (CERC) | |

Disbursement Summary (from Parent ISR)

| Source of Funds | Net Commitments | Total Disbursed | Remaining Balance | Disbursed |
|-----------------|-----------------|-----------------|-------------------|--|
| IBRD | 133.90 | 18.46 | 116.46 |  14 % |
| IDA | | | |  % |



| | | | | | |
|--------|------|------|------|--|-----|
| Grants | 8.00 | 0.48 | 7.52 | | 6 % |
|--------|------|------|------|--|-----|

MPA Financing Data (US\$, Millions)

| | |
|--------------------------------|--------|
| MPA Program Financing Envelope | 332.40 |
|--------------------------------|--------|

MPA FINANCING DETAILS (US\$, Millions)

| | |
|---|--------|
| Board Approved MPA Financing Envelope: | 332.40 |
| MPA Program Financing Envelope: | 332.40 |
| of which Bank Financing (IBRD): | 302.79 |
| of which Bank Financing (IDA): | 0.00 |
| of which other financing sources: | 29.61 |

PROJECT FINANCING DATA – ADDITIONAL FINANCING (Sava and Drina Rivers Corridors Integrated Development Program Additional Financing - P180507)

FINANCING DATA (US\$, Millions)

SUMMARY (Total Financing)

| | Current Financing | Proposed Additional Financing | Total Proposed Financing |
|---------------------------|-------------------|-------------------------------|--------------------------|
| Total Project Cost | 151.50 | 40.53 | 192.03 |
| Total Financing | 141.90 | 40.53 | 182.43 |
| of which IBRD/IDA | 133.90 | 40.53 | 174.43 |
| Financing Gap | 9.60 | 0.00 | 9.60 |

DETAILS - Additional Financing

World Bank Group Financing

| | |
|--|-------|
| International Bank for Reconstruction and Development (IBRD) | 40.53 |
|--|-------|



COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

Yes No

Does the project require any other Policy waiver(s)?

Yes No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

| E & S Standards | Relevance |
|---|------------------------|
| Assessment and Management of Environmental and Social Risks and Impacts | Relevant |
| Stakeholder Engagement and Information Disclosure | Relevant |
| Labor and Working Conditions | Relevant |
| Resource Efficiency and Pollution Prevention and Management | Relevant |
| Community Health and Safety | Relevant |
| Land Acquisition, Restrictions on Land Use and Involuntary Resettlement | Relevant |
| Biodiversity Conservation and Sustainable Management of Living Natural Resources | Relevant |
| Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities | Not Currently Relevant |
| Cultural Heritage | Relevant |
| Financial Intermediaries | Not Currently Relevant |

NOTE: For further information regarding the World Bank’s due diligence assessment of the Project’s potential environmental and social risks and impacts, please refer to the Project’s Appraisal Environmental and Social Review Summary (ESRS).

INSTITUTIONAL DATA

Practice Area (Lead)

Water

**Contributing Practice Areas****Climate Change and Disaster Screening**

This operation has been screened for short and long-term climate change and disaster risks

PROJECT TEAM**Bank Staff**

| Name | Role | Specialization | Unit |
|--------------------------|---|---------------------------------|-------|
| Mahwash Wasiq | Team Leader (ADM Responsible) | | SWAGL |
| Darko Milutin | Team Leader | Co-TTL | SCAUR |
| IGOR PALANDZIC | Team Leader | Co-TTL | SCAWA |
| Luis C. Blancas Mendivil | Team Leader | Co-TTL | IECT1 |
| Orjana Ibrahim | Procurement Specialist (ADM Responsible) | | EECRU |
| Antonia G. Viyachka | Procurement Specialist | | EECRU |
| Lamija Marijanovic | Financial Management Specialist (ADM Responsible) | Financial Management Specialist | EECG2 |
| Alexandra C. Bezeredi | Social Specialist (ADM Responsible) | | SCASO |
| Esmā Kreso Beslagic | Environmental Specialist (ADM Responsible) | | SCAEN |
| Cecilia Belita | Team Member | | SCAWA |
| Estella Malayika | Team Member | | SCAWA |
| Marie Roger Augustin | Team Member | Legal | LEGLE |
| Rahmoune Essalhi | Procurement Team | | EECRU |
| Ruxandra Costache | Team Member | Legal | LEGLE |
| Selma Ljubijankic | Social Specialist | | SCASO |
| Tamara Travar | Procurement Team | | EECRU |
| Tanvir Hossain | Procurement Team | | EECRU |



Extended Team

| Name | Title | Organization | Location |
|------|-------|--------------|----------|
|------|-------|--------------|----------|



I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING

A. Introduction

1. This Project Paper seeks approval of the Executive Directors to provide an Additional Financing (AF) in the amount of EUR 37 million (US\$40.53 million equivalent) to Bosnia and Herzegovina (BiH) under the First Phase of the Sava Drina Rivers Corridor Integrated Development Program (SDIP, P168862). The AF will provide support to Brcko District (EUR 25 million) and Federation of Bosnia and Herzegovina (EUR 12 million) to improve flood protection and environmental management. SDIP is a regional project using the multi-phase programmatic approach (MPA), which includes International Bank for Reconstruction and Development (IBRD) loans to BiH (US\$32.6 million equivalent), Serbia (US\$85 million equivalent), and Montenegro (US\$16.3 million equivalent). In addition to the World Bank loan, financing for the original project includes a Global Environment Fund (GEF) grant of US\$8 million equivalent to support the regional coordinating body, the International Sava Drina River Basin Commission (ISRBC), and a grant in the amount of EUR 8 million (US\$8.29 million equivalent) from the Western Balkans Investment Framework (WBIF) to support demining of 40 kms of the right bank of the Sava River in BiH.¹
2. The AF will scale up ongoing activities by: (a) expanding the geographic scope to include the Federation of Bosnia and Herzegovina (FBiH) and Brcko District (BD) under BiH Components 1 and 2, (b) protecting additional areas and people from floods in the Sava and Drina River Basins, and (c) improving environmental management. It will also finance project management under Component 3 to cover the expenditures needed to scale-up implementation activities. The Project Development Objective (PDO), “to improve flood protection and enable transboundary water cooperation in the Sava and Drina Rivers Corridors,”² as well as the PDO-level and intermediate indicators will remain the same. The end targets for two PDO-level indicators and two intermediate indicator targets, however, have been increased to reflect the additional activities as presented below.

| PDO Indicators to be revised | Targets | |
|---|------------|------------|
| | Original | Updated |
| People protected from 1 in 100-year flood event in the Sava and Drina River Basins under the project (number) | 200,000.00 | 270,000.00 |
| <ul style="list-style-type: none"> • Of which female (number) | 110,000.00 | 140,000.00 |
| Area protected by flood risk mitigation measures under the project (hectare)(ha)) | 150,000.00 | 165,000.00 |

¹ As per the EC requirements, a ‘side letter’ between the World Bank and the European Commission is needed, prior to funds commitment, in order to agree on specific EC requirements. The World Bank and EC are in the process of finalizing the ‘side letter’

² To conform with the PDO statement “to improve flood protection and enable transboundary water cooperation in the Sava and Drina Rivers Corridors” as per legal agreements in the Parent Project and Additional Financing, the PDO statement will be corrected in the Bank Operations Portal system.



| | | |
|--|----------|----------|
| Intermediate indicators | | |
| Length of embankments or dykes constructed or rehabilitated (kilometers) | 20.00 | 30.00 |
| Stakeholders consulted and engaged during planning and preparation of project interventions (number) | 1,000.00 | 1,200.00 |
| <ul style="list-style-type: none"> Of which female (number) | 510.00 | 610.00 |

3. In addition to the above changes, the AF will finance improvements in solid waste management (SWM) in BD. Thus, one new intermediate indicator, “area protected by improved solid waste management (ha),” will be added to the Results Framework (RF). This activity was envisioned in the original project design and will contribute to achieving the PDO. Planned SWM activities include closing the dump site located on the Sava riverbank and establishing a new waste management facility. These investments will eliminate direct pollution (for example, leachate and solid waste) from the dump site, resulting in positive transboundary effects; improved quality of shared air, soil, and water resources; and improved public health conditions for citizens in the downstream countries (Serbia and Croatia) along the Sava River.
4. At the time of SDIP negotiations, a formal request to participate in the first phase of the MPA was submitted only from Republika Srpska (RS) within BiH, but not from FBiH and BD. Subsequently, FBiH and BD made a formal request to be included in the first phase on November 11, 2021 and project preparation activities started shortly thereafter.
5. The proposed AF complies with the World Bank Investment Project Financing (IPF) Policy and the accompanying World Bank procedures for AF. Implementation progress under SDIP is rated Moderately Satisfactory, and progress toward achieving the development objective is rated Satisfactory. The proposed AF is consistent with the original MPA design, which includes activities aiming to improve flood protection and enable transboundary water cooperation and development in the Sava and Drina Rivers Corridors. Activities in the AF will allow all entities in BiH to participate in SDIP, scale up flood protection activities, and improve environmental management in the entire territory of BiH. SDIP is in full compliance with all legal covenants, and has no outstanding audits or overdue reports.
6. The AF is also aligned with the Global Crisis Response Framework (GCRF), which outlines the WBG response to the ongoing crisis to support medium- to long-term development needs, and it contributes to GCRF Pillar 3 on Strengthening Resilience and Pillar 4 on Resilient Reconstruction. By proposed activities, the AF will address disaster risk management and support climate resilient investments.

B. Project Context and Status

7. SDIP – the first phase of the MPA (Phase I), supports integrated water cooperation through investment in infrastructure improvements and complementary measures that address the current and expected impacts of climate change. Specifically, SDIP intends to address the risk of floods and droughts, thus increasing resilience in the targeted areas and ensuring economic development. Given the Sava and Drina



River Basin's transboundary nature, this will be achieved by supporting coordinated development and management of shared water resources across the affected areas. Broadly, SDIP supports the following:

- **Inland waterway transport.** SDIP will finance upgrading of the navigability of the Sava waterway, including, as a prerequisite, removal of mines from the Sava's right bank within BiH³, and modernization of ports along this corridor to improve market access and reduce transport and logistics costs to/from lagging and leading regions. The investments will also (a) support climate change mitigation, by reducing greenhouse gas (GHG) emissions and local pollutants associated with the transportation of freight, and (b) eventually facilitate improved regional trade.
- **Environmental asset management and development.** SDIP activities will include adaptation of the engineering designs of the underlying navigation infrastructure interventions (for example, dredging, riverbank protection, and river training works) to protect floodplains and revitalize wetlands. These multipurpose interventions will provide the necessary infrastructure to boost sustainable tourism (including ecotourism), a sector with large potential for job creation, and to facilitate investments in other sectors such as irrigated agriculture and manufacturing.
- **Flood protection.** SDIP will include investments to increase protection against floods as well as social and economic resilience to extreme weather events linked to climate change.
- **Regional cooperation and institutional strengthening.** These activities will include policy dialogue, consultations, preparation of basin plans and studies, and investments to strengthen the nexus between water resources management and economic cooperation across the region.

8. SDIP represents an innovative and integrated approach to transboundary water resources management that aims to improve flood protection and enable cooperation in the management of transboundary water resources in the Sava and Drina Rivers Corridors. This objective will be achieved through the following components:

- **Component 1: Integrated Management and Development of the Sava River Corridor**
 - Subcomponent 1.1: Flood protection and environmental management.
 - Subcomponent 1.2: Waterway improvements
 - Subcomponent 1.3: Enhancement of ports facilities, services, and logistics
- **Component 2: Integrated Management and Development of the Drina River Corridor**
 - Subcomponent 2.1: Flood protection and environmental management
 - Subcomponent 2.2: Integrated development of Drina watershed
- **Component 3: Project Preparation and Implementation**
 - Subcomponent 3.1: Project preparation

³ Demining activities financed by the WBIF Grant, will include removal of the mines from the right bank of the Sava River in BiH will enable further investments in the infrastructure works to improve navigation on the Sava River both in Croatia and BiH.



- Subcomponent 3.2: Institutional strengthening and project management
 - **Component 4: Regional Activities**
 - Subcomponent 4.1: Regional dialogue, project management, and coordination
 - Subcomponent 4.2: Regional plans, studies, and strategies of basin-wide importance
9. The proposed activities under the SDIP AF are consistent with the Program Development Objectives (PrDOs) of the MPA and the SDIP PDO. The activities are also strategically aligned with the most recent Country Partnership Framework (CPF, Report No. 172387-BA)⁴ for BiH presented to the Board of Directors on July 17, 2022. The purpose of the AF is to scale up activities in BiH, increase the area and number of people protected from floods, and enable cooperation in transboundary water resources management.
10. The Sava and Drina Rivers Corridors Integrated Development Program MPA was approved by the World Bank's Board of Executive Directors on August 6, 2020, with an overall IBRD financing envelope of US\$332.4 million equivalent. Phase I was approved on the same date, comprising US\$133.90 million equivalent in grants and loans to three countries (Bosnia and Herzegovina, the Republic of Serbia and Montenegro). Effectiveness of the Loan Agreements with the three participating countries was declared in September 2021.
11. As of June 30, 2023, a total of US\$19.00 million (14 percent) has been disbursed in all three countries (largely due to transfers of funds to the designated accounts), while disbursement in BiH totalled US\$5.39 million (16 percent). Numerous activities are currently ready to be implemented. Thus, greater expenditures are expected toward the end of FY23. The status of the ongoing SDIP activities is summarized below:
- **Component 1: Integrated Management and Development of the Sava River Corridor.** This component finances investments in renovation and upgrading of flood protection infrastructure to address the increasing risk of flooding due to climate change, as well as activities needed to improve navigation. Contracts for some infrastructure works are finalized and various activities are under implementation (for example, rehabilitation of the left Sava bank in Jarak in Serbia and forestry-related activities such as plantations in the Sava and Vrbas River inundation area in Republika Srpska). By the end of the second quarter of 2023, additional contracts are expected to be signed in Serbia (for example, embankment stabilization of the left Sava dike in Popova Bara) and in BiH (for example, the main circumferential channel (GOK) between the mouths of the Sava River and the Majejica peripheral canal in Republika Srpska, and construction of a bridge in the municipality of Čelinac over the Vrbanja River). Technical preparation toward implementation of civil works at the Port of Sremska Mitrovica is progressing well and expected to be finalized by end of July 2023.
 - **Component 2: Integrated Management and Development of the Drina River Corridor.** This component supports multipurpose investments along the Drina to reduce the risk and potential impacts of floods. In Montenegro, four municipalities are included (Bijelo Polje, Berane, Plav, and Guisnje along the Lim River in the northern part of the country). For the municipalities of Bijelo Polje

⁴ World Bank Group. 2022. Bosnia and Herzegovina: Country Partnership Framework, FY23 – FY27. World Bank, Washington, DC. World Bank. <https://documents1.worldbank.org/curated/en/469491658939414739/pdf/Bosnia-and-Herzegovina-Country-Partnership-Framework-for-the-Period-FY23-FY27.pdf>.



and Berane, procurement for major infrastructure contracts is ongoing and expected to be signed by the end of September 2023. In Serbia, activities for flood protection in the municipalities of Sjenica, Priboj, Brodarevo, and Zaluge are ongoing with finalization of design and permits expected by end of July 2023.

- **Component 3: Project Preparation and Management.** This component supports: (a) preparation of Phase II regional activities, and (b) operational costs, consultancies, non-consultancy services, and goods required for the establishment and operation of the national/entity project implementation units (PIUs). PIUs in all countries have been established.
 - **Component 4: Regional Activities.** This component supports consultation and preparation of regional studies and plans. The component is financed by a GEF grant that became effective on November 29, 2022 and will be implemented by the PIU established within the Secretariat of the International Sava River Basin Commission (ISRBC). ISRBC prepared a list of activities/studies to be implemented with details on their readiness, terms of reference (ToRs) and timeline for their implementation. Preparation of the regional studies and plans (for example, tourism master plan and river basin management plan) is expected to be initiated by end CY 2023. The plans will include opportunities to (a) increase women’s involvement in economic activities and decision-making, and (b) engage citizens, rural development networks, and NGO representatives through participatory planning and capacity building.
12. Overall, implementation has been slower than expected due to several factors, including: (a) delays in establishment of PIUs because of frequent political changes and elections in the participating countries; (b) the slow pace of preparing environmental, social and engineering designs, and documentation related to the implementation of infrastructure investments; and (c) low capacity in planning and executing procurement packages and contract management. Based on lessons learned to date, however, the World Bank team will work with client countries to accelerate project implementation, including: (i) providing guidance to ensure appropriate implementation capacities; (ii) providing support for proper packaging and execution of procurement activities; (iii) sharing project documents, TORs, and procurement templates for similar activities to be implemented; (iv) preparing design documents during the period prior to AF effectiveness; (v) strengthening existing PIU capacities and conducting training in various Bank procedures and requirements; and (vi) convening monthly virtual meetings with all PIUs to monitor the status of agreed actions.

C. Rationale for the Additional Finance

13. The proposed activities under this AF were discussed during the preparation of the SDIP. At that time, the activities in BD and FBiH were part of the original project design and appraised under the assumption that FBiH and BD will finalize the administrative procedures and receive approval for new investments within its government structures. This accounts for specific references to FBiH and BD activities in the SDIP Project Appraisal Document (PAD)⁵. At the time of loan negotiations, however, none of the internal procedures in FBiH and BD were finalized. Thus, negotiations proceeded with the understanding that an AF would be

⁵ <https://documents1.worldbank.org/curated/en/747801597024819197/pdf/Bosnia-and-Herzegovina-Montenegro-and-Serbia-First-Phase-of-the-Sava-and-Drina-Rivers-Corridors-Integrated-Development-Program.pdf>



necessary to ensure participation of FBiH and BD in Phase I.

14. On November 11, 2021, the BiH Ministry of Finance and Treasury (the “Borrower”) informed the World Bank that the FBiH and BD finalized their internal processes and asked to be included in Phase I of the SDIP. The Ministry requested an AF in the amount of EUR 37 million to finance activities in FBiH and BD. Because some of the proposed activities were not appraised during the preparation of the original project, the World Bank team worked with FBiH and BD to expedite preparation activities. The Client subsequently prepared the necessary technical documentation (feasibility studies, design, and bill of quantity (BoQ) as well as the related environmental and social documents for the proposed investments. These new activities will be included in the original project with adjustments made to the indicators and the number of project beneficiaries. AF will have the same PDO as Phase I⁶, and the requested funds are included within the MPA financing envelope approved by the Board.
15. The Phase I activities were identified and prepared through World Bank support in the region as well as other initiatives financed by national resources and other financiers, including GEF and WBIF. Subprojects will be implemented at the national level and will have cumulative regional benefits. Phase I will also finance the preparation of additional transformational, multi-purpose regional investments to be financed under Phase II, and the planned strengthening of women’s involvement in economic activities through Small and Medium Enterprises (SMEs) under the regional tourism master plans and associated ToRs. The AF will enable implementation of SDIP throughout BiH (Republika Srpska, FBiH, and BD) which is politically important for the World Bank’s engagement in BiH and the region. Counterparts in BiH will be engaged in the preparation of the regional studies under Component 4, which will be the opportunity to emphasize the importance of addressing the specific needs and concerns of women-headed SMEs as well as exploring potential job opportunities for women and ways to ensure that women-headed SMEs can benefit from flood recovery resources.
16. At appraisal, SDIP was given an overall Environmental and Social risk rating of High. These risks have been mitigated with the development of an Environmental and Social Management Framework (ESMF), Labor Management Plan (LMP), Stakeholder Engagement Plan (SEP), and Resettlement Policy Framework (RPF), all of which are currently adopted and approved by borrowers. These govern all subsequent development of site-specific due diligence documentation. environmental and social (E&S) due diligence was discussed with each of the three PIUs in BiH. PIU staffing, however, still needs to be completed. Once the PIU E&S specialists are fully on board, a separate meeting and introduction or training will be organized by the World Bank specialists. Until this is done, the Bank team will be available to provide timely guidance on integrating environmental and social processing into project preparation and designs or documentation currently being prepared. The package of documents that was disclosed on December 31, 2019 for BiH has been updated to provide more details on the proposed activities in BD and FBiH, and was disclosed on the client’s and the World Bank external websites as part of the processing of the AF in February-April 2023. The Environmental and Social Review Summary (ESRS) was disclosed in the Bank’s Operations Portal on April 14, 2022.
17. The proposed operation is fully aligned with the goals of the Paris Agreement regarding mitigation and

⁶ See footnote 2.



adaptation. With regard to mitigation, in its latest Nationally Determined Contribution (NDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC), BiH committed to reducing GHG emissions by 33.2 percent by 2030 compared to 1990 levels. An assessment that was carried out during project preparation concluded that there is no material risk of the project having a negative impact on the country's low-GHG-emissions development pathways. In terms of adaptation, the country committed to increasing the resilience of the country to climate variability and climate change impacts, referring specifically to floods in its NDCs. The project will contribute to the adaptation goals by financing various flood protection and environmental management measures, which will: reduce climate-related damage to agricultural production on land likely to suffer frequent floods; avoid damage to assets (for example, private houses, apartment buildings, industrial facilities, roads, power lines, schools, kindergartens, and health facilities); and have other positive impacts. Further, the assessment concluded that there were no aspects of the project that would exceed or undermine the country's ability to meet its nationally determined climate objectives.



MPA Program Framework

| Phase # | Project ID | Sequential or Simultaneous | Phase's Proposed DO* | IPF or PforR | Estimated IBRD Amount (\$ million) | Estimated IDA Amount (\$ million) | Estimated Other Amount (\$ million) | Estimated Approval Date | Estimated Environmental & Social Risk Rating |
|-----------------------------------|------------|-----------------------------|---|--------------|------------------------------------|-----------------------------------|-------------------------------------|-------------------------|--|
| 1 | P168862 | Sequential and Simultaneous | Improve flood protection and enable transboundary water cooperation in the Sava and Drina Rivers Corridors. | IPF | 133,900,000.00 | 0.00 | 9,600,000.00 | | High |
| AF | P175192 | | | IPF | 0.00 | 0.00 | 8,000,000.00 | | High |
| AF | P180507 | | | IPF | 40,530,000.00 | 0.00 | 0.00 | | High |
| 2 | | | | IPF | 128,360,000.00 | 0.00 | 12,010,000.00 | | High |
| Total | | | | | 302,790,000.00 | 0.00 | 29,610,000.00 | | |
| Revised Financing Envelope | | | | | | | \$ 332,400,000.00 | | |
| Board Approved Financing Envelope | | | | | | | \$ 332,400,000.00 | | |

Previous Approved Version



| Phase # | Project ID | Sequential or Simultaneous | Phase's Proposed DO* | IPF or PforR | Estimated IBRD Amount (\$ million) | Estimated IDA Amount (\$ million) | Estimated Other Amount (\$ million) | Estimated Approval Date | Estimated Environmental & Social Risk Rating |
|-----------------------------------|------------|----------------------------|----------------------|--------------|------------------------------------|-----------------------------------|-------------------------------------|-------------------------|--|
| 1 | P168862 | | | IPF | 133,900,000.00 | 0.00 | 9,510,000.00 | | High |
| 1 | P175192 | | | IPF | 0.00 | 0.00 | 8,000,000.00 | | High |
| AF | P179391 | | | IPF | 0.00 | 0.00 | 0.00 | | |
| 2 | | | | IPF | 0.00 | 0.00 | 12,100,000.00 | | High |
| Total | | | | | 133,900,000.00 | 0.00 | 29,610,000.00 | | |
| Revised Financing Envelope | | | | | | | \$ 332,400,000.00 | | |
| Board Approved Financing Envelope | | | | | | | \$ 332,400,000.00 | | |



II. DESCRIPTION OF ADDITIONAL FINANCING

A. Description of Proposed Activities

18. The proposed AF for the Phase I of the MPA will finance the expansion of the geographic scope of activities already included in the original project under Component 1 (US\$37.40 million), Component 2 (US\$1.04 million), and Component 3 (US\$1.98 million).⁷ The latter will cover the additional costs for financial management, environmental and social management, and knowledge/communications. The activities to be financed under the AF are described below.

Component 1: Integrated Management and Development of the Sava River Corridor (US\$37.40 million equivalent).

19. **Subcomponent 1.1: Flood protection and environmental management.** In FBiH, planned activities include flood protection measures in the Sava River Basin (Bosna River, Zeljeznica River, and Jala River) and preparation of future Phase II investments (for example, construction of a sport-recreational port on the Sava River in the City of Orasje). FBiH proposed 11 subprojects to be financed under the AF. Each subproject is at a different stage of preparation, varying from feasibility study to preparation of the Environmental and Social Management Plan (ESMP). The subprojects include flood protection works (five), riverbed regulation works (three), storage dam repair (one), and river boat station works (two). Detailed designs are completed for all flood protection interventions. When the ESMPs are completed, the construction clearances from relevant agencies and the FBiH Government will be issued. This subcomponent directly address GCRF Pillar 4 focussing on the climate-smart investments and facilitating resilient reconstruction.
20. In BD, five subprojects were submitted for inclusion in the SDIP-I. Apart from the regulation of the flows of the Blizna River and Brka River, BD will establish an integrated system of waste management that will have positive transboundary effects. Currently, solid waste in the district is deposited on a landfill located on the riverbank of the Sava River, which is a natural border with the Republic of Croatia. Leachate from this landfill contaminates surface and groundwater, directly endangering the Sava River. During floods, the waste is washed into the river, transported, and deposited downstream on the Sava banks in BiH, Croatia, and Serbia. Closing the landfill and establishing a new waste management facility in BD will have positive effects on transboundary pollution; improved shared air, soil, and water resources; and have public health benefits for citizens in the downstream countries (Serbia and Croatia) along the Sava River. In addition, the project will support tourism, one of the main sectors for regional integration and economic cooperation along the Sava and Drina Rivers, by constructing sidewalks and bicycle routes along the right bank of the Sava River. This infrastructure will be connected to EuroVelo, the network of long-distance cycle routes connecting the entire European continent, and thus improve regional cross-border cooperation and tourism development. These activities in BD will support the SDIP's long-term objective of economic, social, and environmental connection along the Sava and Drina Rivers. The client prepared technical documentation for these activities and the related environmental and social safeguard documents. The proposed activities will be integrated into the Regional Master Plan prepared under Component 4. They

⁷ Excludes financing of the front-end fee of US\$0.1 Million equivalent.



also will accelerate the formation of a forum of women-headed SMEs to provide input to the Tourism Master Plan design and identify opportunities for women-headed SMEs in regional sustainable tourism.

21. The following are some of the expected benefits of the proposed flood protection structures: (a) avoided damage to agricultural production on land likely to suffer from frequent floods; (b) avoided damage to assets (private houses, apartment houses, industrial facilities, roads, electricity lines, schools, kindergartens, health facilities, and other public buildings); (c) avoided losses of business due to uninterrupted production, provision of services, and reliable communications; (d) avoided human health costs due to reduction of pollution in the water supply systems, reduced water borne diseases, and reduced risks of human life losses; (e) increased recreation benefits, including tourism development; (f) direct economic and financial effects from sale of recycled solid waste; and (g) indirect economic development effects. Because the flood protection subcomponents vary in size and coverage (some will protect a large number of houses or businesses, while others will protect fewer houses and more agricultural land), the economic benefits from reduced losses will also vary. For example, flood protection in Modrac will benefit 5,330 houses, 700 apartments and 222 businesses. In Brcko, by contrast, most benefits will come from protecting agricultural land due to expansion of agribusiness.

Component 2: Integrated Management and Development of the Drina River Corridor (US\$1.04 million)

22. **Subcomponent 2.1: Flood protection and environmental management.** In FBiH, planned activities include flood protection measures in the Drina River Basin. These will encompass urgent rehabilitation works in Goražde and regulation of the Kosovska River in the Ustikolina municipality. Same as subcomponent 1.1, this one will directly address GCRF Pillar 4 focussing on the climate-smart investments and facilitating resilient reconstruction.

Component 3: Project Management (US\$1.98 million)

23. This component will support overall project management, financial management (FM), procurement, environmental and social management, and communications in PIUs responsible for project implementation in FBiH and BD.

Implementation Arrangements

24. Implementation of the proposed activities under AF will be undertaken by PIUs within FBiH and BD. PIUs are established and will be strengthened where needed with the technical and managerial expertise to support project implementation. In FBiH, the existing PIU within the FBiH Ministry of Agriculture, Water Management and Forestry will be responsible for implementing activities in FBiH. The Federal Ministry of Communications and Transport, Water Agency Sava, and other institutions responsible for navigation, flood protection, and tourism will provide technical support. In BD, the PIU established by the Government of BD will be responsible for implementing activities in BD, with support provided by all relevant BD Government departments.
25. Each PIU/Project Management Unit (PMU) will be responsible for implementing the following activities: (a) carrying out procurement and supervision/monitoring of contracts; (b) maintaining effective internal control procedures; (c) accounting for expenditures in their existing budgetary accounting systems; (d) receiving funds; (e) making payments; and (f) providing documentation and information related to the use



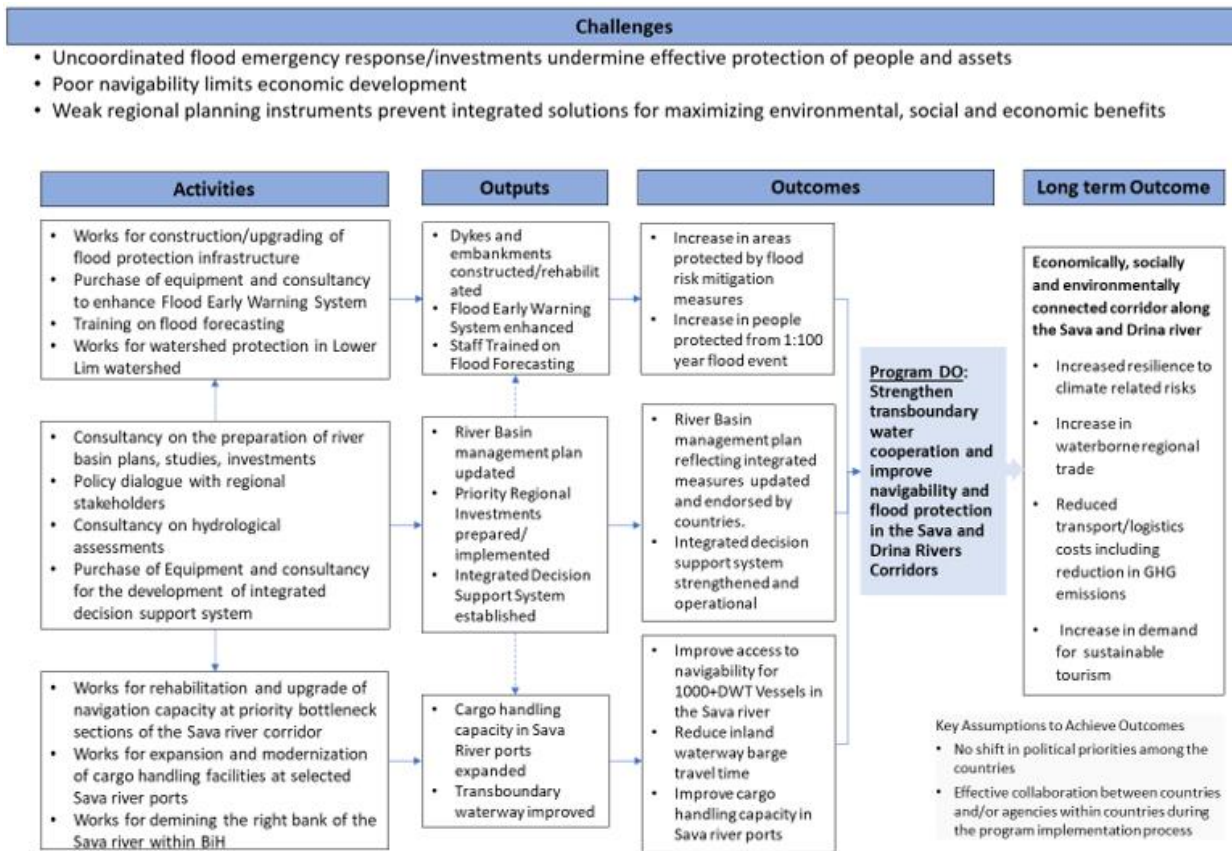
of the loan/grant proceeds, statement of expenditures (SOE) for the eligible expenditures, project reporting, and monitoring.

Alignment with the Sava and Drina Rivers Corridors Integrated Development Program Theory of Change

26. SDIP aims at two global environmental objectives: (a) adapting to climate change as it relates to flood protection in the Sava and Drina Rivers Corridors; and (b) preserving freshwater resources by improving sustainability in the Sava and Drina Rivers Corridors. Tackling both global issues requires the countries to coordinate actions and apply informed management approaches. Thus, the project is designed on the basis of an integrated management and development approach involving coordinated and multisectoral planning and use of the water and related resources of the Sava and Drina Rivers Corridors. It also aims to maximize economic and social benefits while improving the sustainability of these vital natural resources. In this regard, the project addresses the gap in women's economic activities related to tourism and flood recovery within the region. In addition, the project will address the main barriers to water management cooperation. To achieve this, AF will support flood protection and environmental management as well as activities to strengthen cooperation on regional tourism.
27. The proposed investments under SDIP will result in: (a) improved flood and drought protection with enhanced climate adaptation capacity, (b) increased navigability with reduced levels of transport-related emissions of greenhouse gases and local pollutants, (c) revitalized regional tourism along the Sava and Drina Rivers Corridors, and (d) transboundary water management cooperation based on a strengthened integrated decision support system. It will also improve the analytical and management capacity of water, transport, and related agencies in each beneficiary country, as well as that of the ISRBC. Equally important, the program will present a relatively neutral opportunity for the countries in the region to signal their ability and willingness to collaborate in tackling transboundary issues, such as the demining of the right bank of the Sava in BiH and rehabilitation of mutually beneficial infrastructure.



Figure 1. Overview of the Sava and Drina Rivers Corridors Integrated Development Program Theory of Change



III. KEY RISKS

28. The overall risk to achieving the PDO is considered High because the program addresses challenges that are multi-sector, multi-country, and transboundary in nature. Specific risks are described below.
29. **Political and Governance: Substantial.** BiH has a complex political structure. Moreover, general elections took place on October 2, 2022, and the new authorities are still in the process of being formed at the nation, entity, canton, and district levels. This may affect project implementation. To mitigate this risk, during preparation, the project team defined implementation arrangements that include clear roles and responsibilities for the institutions involved. If the political processes take longer than anticipated, the technical authorities will proceed with the proposed activities.
30. **Macroeconomic: Substantial.** This risk is not entrenched in unsustainable macro policies. BiH is in a relatively good fiscal position, and monetary policy is anchored in the currency board, which is adequately supported by foreign reserves. However, a worldwide economic downturn could have a substantial impact on Western Balkan countries' economic growth, balance of payments, and fiscal position. Further, an economic crisis would constrain the fiscal space for improvements in water-related sectors. As a mitigation



measure, project financing will be earmarked to support specific activities within the program. The grant financed component will also not be affected by changes in the macroeconomic environment. Nonetheless, the residual risk is considered Substantial.

31. **Institutional Capacity for Implementation and Sustainability: Substantial.** Institutional and implementation arrangements are complex across entities in BiH. Further, implementing institutions have various capacities in project implementation and management. While authorities in FBiH have successfully implemented World Bank projects in the past, institutional arrangements in BD and BiH are of particular concern because of the lack of experience implementing World Bank projects. Thus, the Bank will support implementation through close engagement with program beneficiaries and by offering technical expertise in the areas within SDIP's scope. In addition, the Bank will support the implementing institutions through regular missions, local presence, training on Bank-related procedures, and knowledge sharing workshops.
32. **Technical Design: Substantial.** The proposed AF includes numerous subprojects in different sectors involving various groups of stakeholders. Considering the complexity of the project and program, the number of sectors and countries involved, the project's technical design could become too complex. To mitigate this risk, during project preparation, activities were identified in consultation with the countries to verify their technical and financial viability, readiness, and implementation arrangements. Available documentation such as feasibility studies and detailed designs, where available, were reviewed to confirm their technical and financial soundness. This process already led to the selection of a more refined and limited subset of investments for implementation in Phase I.
33. **Environmental and Social Risk: High.** The activities to be supported by the AF involve a variety of sectors, issues, and stakeholders. They include flood protection and environmental management, regional dialogue, studies, and demining of the Sava waterway to improve the navigability of the Sava River. Considering the geographic and sectoral width of the program, the need for coordinated stakeholder consultations and decision making, limited Borrower capacity, and number of institutions involved, the environmental and social risk is high. This risk will be mitigated through targeted training for staff in all participating institutions as well as establishment of monitoring tools that will ensure transparent and quality implementation of environmental and social safeguards management.
34. **Stakeholders: Substantial.** Successful implementation will require strong public-sector capacity at the regional, national, and local levels, as well as a coordination body that has adequate political support and authority. Specific stakeholder risks include: (a) government counterparts not seeing the value added of SDIP, and thus be unwilling to coordinate and collaborate during the program implementation process; (b) delays caused by disagreements among countries, and/or agencies within countries, regarding prioritization, design, timing, funding, and execution of activities that require consensus; and (c) delays or implementation complications arising from shifting political priorities among the countries, such as the result of elections or re-alignments in policy decision-making. In addition, local stakeholders may object to specific investments. These risks will be mitigated through the proposed implementation arrangements, which allow for discussion, feedback, and deliberation at the regional, national, and sub-national levels. In addition, all subprojects already have been identified and agreed upon by the countries.



IV. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

35. The proposed project is expected to contribute substantially to improving the livelihoods of poor communities in the project areas because losses to public infrastructure, agricultural production, business activity, and household assets would be significantly reduced. Recent studies (including the efficiency analysis conducted for the Bank-financed Drina Flood Protection Project (P143844) on crop budgets, land use, damage estimates for different flooding frequencies, and project costs) confirmed the economic feasibility of the proposed investments to be financed by the AF. Based on a more detailed analysis of the works to be done, and new information about the costs of the damage caused by the devastating floods of 2010 and 2014, the proposed project is economically viable.
36. For the investments related to flood protection, the values of avoided damages were calculated to be the difference between damages under the existing situation (without the proposed project) and the project scenario in which there would be no damages occurring up to a certain magnitude of river overflows and flood events. Because the latter occurs at different magnitudes and frequency, the calculation accounts for the probability of occurrence at different flood magnitudes and related damages weighted by the respective probability in both scenarios. A conservative approach was applied, using between 10 percent and 20 percent probability of floods (that is, every five to ten years depending on the site). The analysis also assumed less damages from floods than the historical average.⁸
37. Due to the competitive market for factors of production in BiH, no significant price distortions were considered in the economic analysis. The average estimated value of damages to houses was estimated on the basis of an average property value of 550 USD/m².⁹ The price was based on the cost of renovating the walls, floors, and electricity/phone cables (estimated at 20 percent of the value of the building of the same surface as the one affected by the flood), and the irreversible damage to furniture and household appliances. The costs of the damage to schools and other public buildings were calculated in a similar manner. Considering the lack of data on the health-related benefits, these were not considered in the avoided damages calculations. However, for the investments in landfill closure in BD, health benefits were calculated using information about potential health impacts after the rehabilitation. In the case of industrial/business assets, the damages were estimated at 30 percent of the costs of the building, assuming irreversible damage to the industrial equipment. Indirect damages for companies due to the loss of added value and lower efficiency of work after the event have been evaluated with a specific value of BiH Convertible Mark (BAM) per productive facility annually, applying unit estimates that are standard under EU guidelines. In cases when the data were not complete or reliable, the analysis applied the indicators used for the Drina Flood Protection Project as a proxy.
38. About 13,836.63 ha of land, including 4,166.6 ha of agricultural land and 9,670 ha of industrial land, will

⁸ Data on damages reported from 2010 and 2014 floods were used to compute the historical average.

⁹ These averages were also used for the Drina Flood Protection Project in April 2014. The average property value and damage repair costs might have increased recently due to inflation in the last eight years, suggesting that the analysis used a conservative approach.



be protected (to a higher standard) against the risk of floods in the Sava River corridor in FBiH's main locations to be protected (in Canton Sarajevo Municipalities Novi Grad, Vogosca, Vojkovici, in Tuzla Canton Modrac, Lukavac, and Tuzla). Additional land will be protected in BD as well. The income security and living conditions of the landholders along the proposed structures will improve because crops will be more regular and reliable with fewer losses due to less re-seeding, fewer crop failures, and cultivation of more land. Budgets for the main agricultural activities and farm models were developed for quantifying the financial impact of the project on beneficiaries, based on average crop yields, costs of production, and cropping patterns. The models also take into account that recurrent floods reduce average yields of crops by about 10 to 15 percent. The technical estimates show that beneficiary farmers' net incomes would increase from on average 12 to 40 percent in the case of field crops (wheat, barley, maize, and fodder crops), and from 15 to 80 percent in the case of fruits and vegetables (open field and/or under greenhouses).¹⁰

39. Farm models combining typical cropping patterns were also prepared, representing the farms in the project areas. Farms averaging 0.5 ha producing fruits and vegetables, and 2 ha farms producing field crops show that revenues would improve substantially because the risk of floods is minimized, and conditions allowing for more intensive cropping are met. The reduction of private assets lost to floods will also contribute to improving livelihoods due to the flood protection works. Models show that farmers could increase their net incomes by 60 to 80 percent in the project areas once flood risks are reduced.¹¹
40. The overall economic assessment shows that the aggregate project investments would have a strong Economic Rate of Return (ERR) of 17.7 percent, an estimated Net Present Value (NPV) of EUR 79.6 million and a strong Benefit to Cost (B/C) ratio of 2.5 (Table 1). The total average ERR and B/C ratios were calculated by aggregating all benefits and costs from all project components.¹² The proposed investments will reduce the frequency and costs of flooding in the covered area. Agriculture, industries, tourism, and other livelihood and economic activities will become more attractive for private investment because climate-related risks will be substantially reduced. Based on estimated project investment costs, operating costs, and the value of avoided damages, together with expected private investment as the risks of flooding are mitigated, the ERR for the proposed investments in BD is 17.3 percent with an NPV of EUR 45.3 million and a B/C of 2.3. For the project sites in FBiH, the average ERR is 18.2 percent with an NPV of EUR 34.4 million and an average B/C of 2.8. The individual ERR varies for each sub-component and each project site, fluctuating from 8.5 percent in the FBiH sub-component 1.2, to 26.6 percent in the FBiH sub-component 1.1. In all components, a substantial, non-quantified benefit will also be generated from the social benefits due to the protection of the poorer and more vulnerable communities themselves, and the infrastructure serving these communities. These social benefits, however, were not considered in the analysis.

¹⁰ Due to lack of farm specific data, these calculations are used as a proxy from the analysis carried out for the Drina Flood Protection Project, which has similar features to this project.

¹¹ Same as above.

¹² The project is highly complex and mainly divided in parts of BD and FBiH. Both Brcko and FBiH parts are disaggregated to components flood protection and other components (each having their sub-components). A spreadsheet was used to model each sub-component separately, and then the sub-components were aggregated to components and further aggregated to total project benefits and costs.



Table 1. Expected Overall Project Results

| | NPV (in 000 EUR) | ERR | B/C |
|---------------|------------------|-------|-----|
| Total Project | 79,624 | 17.7% | 2.5 |
| Brcko Total | 45,255 | 17.3% | 2.3 |
| FBiH Total | 34,370 | 18.2% | 2.8 |

Source: Calculation using cost benefit model

41. The sensitivity analysis also suggests an economically viable investment, with an overall B/C ratio of 1.7 despite a lower ERR at 7.9 percent in worst case scenarios of 20 percent benefit decline and 20 percent increase in costs. Two worst case scenarios were computed: (a) a 10 percent decline in benefits and 10 percent increase of overall costs (including investment costs); and (b) a 20 percent decline in benefits and 20 percent increase in overall costs. In both scenarios, the overall project average B/C ratios and the averages for both BD and FBiH performed well. Although all tested subcomponents in the 10 percent sensitivity test had an ERR of over 12 percent and average B/C of 2.1, they were more sensitive in the 20 percent sensitivity test (Table 2). Annex 1 presents a more detailed explanation.

Table 2. Sensitivity Test Analysis Results

| | ERR baseline | ERR 10% | ERR 20% | B/C baseline | B/C 10% | B/C 20% |
|---------------|--------------|---------|---------|--------------|---------|---------|
| Total Project | 17.7% | 12.4% | 7.9% | 2.5 | 2.1 | 1.7 |
| Brcko total | 17.3% | 12.6% | 8.6% | 2.3 | 1.9 | 1.5 |
| FBiH total | 18.2% | 12.2% | 6.9% | 2.8 | 2.4 | 1.8 |

Source: Calculation using economic model and sensitivity tests

B. Technical Analysis

42. During the preparation of SDIP, activities in BiH (FBiH and BD) were discussed with the participating governments. Activities to be implemented in FBiH and BD were integrated in SDIP design and appraised under the assumption that FBiH and BD will finalize the administrative procedures (receiving approval for new investments within their government structures). Specific references to the FBiH and BD activities are included in the PAD prepared for the original project.
43. Proposed activities under this AF are similar to those being financed under SDIP. They mainly include construction and rehabilitation of embankments and river training for protection from the 100-year floods. The preliminary and detailed designs for these activities will be based on reliable and adequate information obtained from detailed geological and hydrological investigations, as well as consultations with the stakeholders located near the Sava and Drina Rivers. In total, 11 subprojects from FBiH and 5 from Brcko are proposed to be financed through the AF. Flood-related activities are on the Bosna and Zeljeznica Rivers in Sarajevo and Jala River in Tuzla. In Brcko, proposed activities are on the Blizna and Brka Rivers, which are direct tributaries to the Sava River. Activities related to environmental management include improving SWM in Brcko by closing an old landfill and establishing a modern solid waste management facility. Preparation of the technical documentation for these proposed activities is ongoing in both FBiH and BD.
44. The operation is aligned with the goals of the Paris Agreement on both mitigation and adaptation. The



following summarizes how the project addresses both adaptation and mitigation risks.

- **Assessment and Reduction of Adaptation Risks.** The main climate and disaster risks likely to affect project investments relate to flooding. Both destructive floods and prolonged dry spells are common in the Sava and Drina River Basins. Moreover, climate change is predicted to cause more intense flooding in terms of magnitude, frequency, and duration, according to trends and variations in the mean values of precipitation, evapotranspiration, and discharges into the basins. Current estimates, specifically for the Sava River Basin, predict an increase in flood peaks by up to eight percent. The project takes into consideration these predicted precipitation and flooding risks. Specifically, climate change risks and vulnerability to floods will be managed and mitigated through targeted adaptation measures on both the Sava and Drina Rivers by combining structural and soft adaptation solutions. The flood protection measures will protect additional areas and people from floods and improve environmental management, thus increasing resilience in the targeted areas in the event of climate-related shocks. Through the enhancement of the areas' adaptation and resilience, the project will lead to: avoided damage to private houses, apartment buildings, industrial facilities, roads, schools, kindergartens, and health facilities, and other assets; avoided losses of business due to uninterrupted production, provision of services, communications, and traffic; and avoided human health costs due to reduced pollution in the water supply, reduced water borne diseases, and reduced losses of human lives. Other activities include riverbed regulation works and storage dam repairs which will complement the project's climate resilience and adaptation goals. Overall, given the project's approach to climate resilience and adaptation, there is a low level of residual risk regarding adaptation.
- **Assessment and Reduction of Mitigation Risks.** The operation is not at risk of having a negative impact on the country's low-GHG-emissions development pathways. All AF activities fall under the latest draft of the universally aligned list. With regard to mitigation, the operation has a very low risk of preventing the country's transition to low-carbon development pathways given its contribution to increasing adaptation and resilience to flooding.

C. Financial Management

45. An assessment of the FM capacity of project-related institutions was carried out by the World Bank during the preparation mission in December 2022, and updated in March 2023. The assessment concluded that the financial management arrangements in the project management units need to be strengthened as per the agreed action plan. The overall financial management risk is Substantial before the introduction of risk mitigation measures. However, with the introduction of the mitigation measures (including support to the implementing institutions through regular missions, local presence, training on Bank-related procedures, and knowledge sharing workshops), and regular reporting and auditing of the project activities, the risk is reduced to Moderate.
46. Both the FBiH PIU and BD PIU will maintain a financial management system acceptable to the Bank. The project's financial statements, including the SOE and Designated Account (DA) Statements, will be audited by independent auditors with ToR acceptable to the Bank. The annual audited financial statements and audit reports will be provided to the Bank within six months of the end of each fiscal year. The PIUs shall



prepare and furnish to the Bank, not later than forty-five (45) days after the end of each calendar semester, interim un-audited financial reports for the project covering the semester in form and substance satisfactory to the Bank.

- 47. To improve the existing FM arrangements, an action plan has been agreed with the implementing units. According to the plan, all implementing units will nominate persons to be in charge of both financial management and project accounting. All units will acquire software for the project accounting, and two units will prepare the FM section of the Project Operational Manual (POM). In addition, the BD PIU will establish a project accounting function because its accounting services are currently outsourced due to the limited number of past transactions. When AF implementation begins, it is advisable for the PIU to carry out its own project accounting in order to ensure timely reporting.

Summary of Actions

| Action | Deadline | Responsibility |
|---|----------------------------------|-----------------|
| Qualified FM and procurement (PM) staff are either hired or nominated | three months after effectiveness | FBiH PIU BD PIU |
| FM software exists for the project | three months after effectiveness | FBiH PIU BD PIU |
| Prepare and get clearance for the FM and procurement sections of the POM | at the time of effectiveness | FBiH PIU BD PIU |
| Strengthening accounting function of the project by hiring project accountant | three months after effectiveness | BD PIU |

Flow of Funds and Disbursements

- 48. Two DAs will be opened in a commercial bank acceptable to the World Bank, one for each part of the project. Each account will be opened by the Ministry of Finance and Treasury in BiH. The DAs will be denominated in EUR currency.
- 49. Disbursement from the Loan Account will follow the traditional method, either through reimbursement, advances to the DA, or direct payments to suppliers. Withdrawal applications will be approved by authorized persons. Thereafter, the implementing unit will send the approved application directly to the World Bank using the e-disbursement facility.
- 50. Supporting documents for SOEs will be retained by the implementing units and made available to the World Bank during project supervision. Disbursements for expenditures above the SOE thresholds will be made following presentation of the full documentation relating to the expenditures. Reimbursement of expenditures from the DA may be made for certified SOEs, which are based on SOE thresholds defined in the Disbursement and Financial Information Letter (DFIL). The project DFIL also defines the ceiling and authorized allocation for the DAs.
- 51. The remaining FM arrangements, such as planning, budgeting, reporting, internal controls, and external audit, remain the same as under SDIP. The only difference is that the AF will be implemented by the FBiH PIU and BD PIU.

D. Procurement



- 52. Procurement under the project will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers “Procurement in Investment Project Financing for Goods, Works, Non-consulting Services and Consulting Services” (July 2016, revised Nov 2017 and Aug 2018). The project will also be subject to the World Bank’s Anti-Corruption Guidelines, dated July 1, 2016, and governed by the provisions stipulated in the AF Financing Agreement with the country. The implementing agencies (IAs) will use the Systematic Tracking of Exchanges in Procurement (STEP) system.
- 53. In FBiH, the project will be implemented by the existing PIU within FBiH Ministry of Agriculture, Water Management and Forestry (MAWMF) (FBiH PIU), and technical support will be provided by the MAWMF and Sava River Water Agency and other relevant institutions. The FBiH PIU will be in charge of fiduciary arrangements. Based on the procurement capacity assessment conducted for the FBiH PIU, it was determined that the procurement risk is Moderate.
- 54. In District Brcko (DB, the project will be implemented by the DB PIU established by the Government of BD on September 14, 2022. The DB PIU will include, at a minimum, a Head of the PIU and procurement and financial management specialist, with TORs acceptable to the Bank. The main responsibility for the fiduciary arrangements will rest with the DB PIU. The procurement capacity assessment related to the BD PIU was performed in March 2023.
- 55. Each PIU prepared a Project Procurement Strategy for Development (PPSD) outlining the selection methods to be followed by the Borrowers in the procurement of goods, works, and non-consulting and consulting services financed by the Bank. The FBiH Ministry of Agriculture, Water Management and Forestry and the BD procurement plans will be updated at least annually or as required to reflect actual project implementation needs and improvements in institutional capacity.

E. Legal Operational Policies

| | Triggered? |
|---|------------|
| Projects on International Waterways OP 7.50 | Yes |
| Projects in Disputed Areas OP 7.60 | No |

- 56. The activities financed under this AF were appraised as part of SDIP. Riparian countries were informed of these activities through the notification letter sent on April 28, 2023. As of May 29, 2023, which was the deadline set out in the notification letter sent to the riparian countries, no responses have been received.

F. Environmental and Social

- 57. SDIP is a high-risk project with an Environmental and Social Management Framework (ESMF), Labor Management Plan (LMP), Stakeholder Engagement Plan (SEP), and Resettlement Policy Framework (RPF) in place. The package of documents for SDIP was disclosed in December 2019 for all three countries, including BiH. The documents covered the entire country, inclusive of RS, FBiH, and Brcko, where the scope of the activities and the environmental and social baseline reflected the entire Sava and Drina corridors. Nonetheless, the two PIUs identified in this AF reviewed the documents and updated them to provide more details on the project activities. The revised set of documents was disclosed on their websites as part of the processing for the AF in period February - March 2023, with a public consultation meeting taking



place on March 16, 2023 in Brcko, and in April 2023 – on the World Bank external website. The FBIH PIU has an environmental and social specialist on board who is well experienced in implementing Bank projects, under both safeguards and the Environment and Social Framework (ESF). The Brcko District PIU appointed a specialist that has taken an active role in revising the ESF package.

G. Other Corporate Mandates

58. **Gender.** SDIP’s proposed interventions will deliver their intended economic and social benefits only if all members of the target populations and end-user beneficiaries, irrespective of gender, can participate in project-related decision-making and access the improved facilities and related economic opportunities. Recovery needs assessment studies conducted in BiH and Serbia revealed that women and men were affected differently in the 2014 flood due to existing gender gaps and cultural norms, which affected social behavior and the recovery process. Specifically, most women in the area were engaged in unpaid household or farm works (64 to 75 percent) and micro enterprises (50 to 81 percent), which were severely affected by the floods. Their lower participation in formal wage labor put them in an even more vulnerable situation because their activities were often not insured, and they lacked access to reconstruction assistance or the other support made available to flood-affected groups. Lack of land titles limited women farmers’ access to resources and collateral to obtain loans for recovery. A qualitative analysis also showed that women were excluded from decision-making in investment and recovery processes. Another reason why women experience slow recovery and larger reductions in income after a flood is that they play a larger role in the household (that is, in caring for family members and dealing with the household’s flood effects). Their work is often informal and more likely to be cut back. The extent of these gaps, what drives them, and how they manifest themselves, can vary from one locality to the next.
59. Delays in the start up of regional activities affected the development of the regional master plans, which aim to increase opportunities for women’s involvement in economic activities. Preparation of these plans is expected to start in CY 2023. Specifically, the project will develop a regional tourism master plan for the Sava and Drina Corridors. Under this plan, the project will support measures to increase women’s participation in economic activities and engagement in decision-making. Because tourism-related jobs are often flexible and can be carried out from different locations, investments in tourism will be designed to create employment opportunities for women who have lost their jobs or means of support through floods. The ToRs of the regional tourism plan will emphasize the importance of capturing the needs and concerns of women-headed SMEs, as well as exploring potential job opportunities for women and ways to ensure that women-headed SMEs can benefit from flood recovery resources. In addition, a forum of women-headed SMEs will be established to facilitate their regular engagement with river basin management authorities and river port authorities, and to influence the tourism master plan design to create more resilient and post-flood employment opportunities for women-headed SMEs.
60. Further, enterprise surveys have shown that women-headed businesses incur higher logistics costs than male-headed ones. Under Component 4, the nature of this gap as it relates to the Sava River Basin will be further explored to better understand the needs and risk exposure of women-headed businesses, and to promote interaction between these businesses and the river port authorities of the Sava River Corridor. SDIP-linked feasibility studies for Phase II activities supported under AF will emphasize assessments of SMEs in the catchment area of the Sava River (SMEs are more likely to be women-headed businesses) to



better understand their logistics and operating needs, and to incorporate the lessons thereof into the design of port and navigation capacity investments.

61. **Climate Change.** The original project will address the risks of climate change (floods) through multiple interventions aimed at both adaptation and mitigation.
62. **Citizen Engagement.** An important component of the learning to be internalized in Phase II from the experience of implementing Phase I activities will be obtained through engagement with end-user populations, the ultimate program beneficiaries. Country-level PIUs will conduct annual consultations with project beneficiaries, including: port users (such as shippers, inland waterway barge operators, truck operators, and other logistics service providers); communities that host Sava River ports; land owners; and technical national and regional institutions, nongovernmental organizations (NGOs), and local government representatives (in addition to the site-specific consultations with PAPs). Much of the engagement with end-user populations and the annual consultations with project beneficiaries has been delayed pending creation of the country-level PIUs which are responsible for the consultations and start up of the regional activities. It is expected that the consultations will begin toward the end of CY 2023 and intensified in 2024. The operational and social needs of the beneficiaries, identified through participatory planning activities, will be reflected in the design of specific flood protection interventions as well as the regional river basin and tourism plans. They also will be reported and monitored in the quarterly progress reports.
63. With regard to flood protection, the project will ensure a strong focus on establishing effective communications channels and establishing annual participatory decision-making systems with all relevant beneficiaries and their representative organizations. In addition, an online citizens platform will be established where information on river basin activities can be shared, input can be solicited, and feedback can be provided to the implementing institutions. The project will ensure that representative bodies engaged in flood protection have adequate representation by both women and youth. For example, the project will work with and train community groups to make concerted efforts to voice issues specific to women. Country PIUs with their social specialists will carry out a screening and consultation process for each activity or investment to help shed light on and raise concerns about the potential impacts on women and youth. Where vulnerable groups are identified, targeted group discussions will be undertaken to address their needs and ensure they benefit from project activities. Flood protection and early warning activities, carried out in areas where communities may be directly affected, will include community-based training and support for the development of local organizations to better equip them in dealing with early warning systems and flood management. In this regard, special attention will be given to women who are affected in various ways, and may be more vulnerable to floods (for example, expectant mothers, female heads of households, and women caring for children).

V. WORLD BANK GRIEVANCE REDRESS

64. Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank's Grievance



Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management, and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's GRS, please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the Bank's Accountability Mechanism, please visit <https://accountability.worldbank.org>.

**VI SUMMARY TABLE OF CHANGES**

| | Changed | Not Changed |
|--|---------|-------------|
| Implementing Agency | ✓ | |
| Results Framework | ✓ | |
| Components and Cost | ✓ | |
| Disbursements Arrangements | ✓ | |
| Project's Development Objectives | | ✓ |
| Loan Closing Date(s) | | ✓ |
| Cancellations Proposed | | ✓ |
| Reallocation between Disbursement Categories | | ✓ |
| Legal Covenants | | ✓ |
| Institutional Arrangements | | ✓ |
| Financial Management | | ✓ |
| Procurement | | ✓ |
| Implementation Schedule | | ✓ |
| Other Change(s) | | ✓ |

VII DETAILED CHANGE(S)**IMPLEMENTING AGENCY**

| Implementing Agency Name | Type | Action |
|--|--|-----------|
| Brčko District | Line Ministry/Ministerial Department | New |
| FBiH Ministry of Agriculture, Water Management and Forestry | Line Ministry/Ministerial Department | New |
| International Sava River Basin Commission | Country/Regional Organization | No Change |



| | | |
|---|--------------------------------------|-----------|
| Montenegro Ministry of Agriculture and Rural Development | Line Ministry/Ministerial Department | No Change |
| Republic of Serbia Ministry of Agriculture, Forestry and Water Management | Line Ministry/Ministerial Department | No Change |
| Republic of Serbia Ministry of Construction, Transport and Infrastructure | Line Ministry/Ministerial Department | No Change |
| Republika Srpska Ministry of Agriculture, Forestry and Water | Line Ministry/Ministerial Department | No Change |

MPA PROGRAM DEVELOPMENT OBJECTIVE

Current MPA Program Development Objective

The objective of the Program is to strengthen transboundary water cooperation and improve navigability and flood protection in the Sava and Drina Rivers Corridors.

Proposed New MPA Program Development Objective

EXPECTED MPA PROGRAM RESULTS

Current Expected MPA Results and their Indicators for the MPA Program

The proposed Investments will result in improved flood protection, increased navigability with reduced levels of transport-related emissions of greenhouse gases and local pollutants, and the revitalization of regional tourism along the Sava and Drina corridors. It would also improve the analytical and management capacity of water resources, transport, and related agencies in each beneficiary country, as well as that of ISRBC. Just as important, the program will be a relatively neutral opportunity for the countries in the region to signal their ability and willingness to tackle transboundary issues together, such as the demining of the right bank of the Sava in BiH, and the mutual collaboration necessary for investing in a shared resource among the riparian countries. The key expected outcome indicators will be achieved over time.

The progress towards PrDO will be measured by the following outcome indicators throughout the MPA program



implementation:

- Area protected by flood risk mitigation measures under the Program(ha)
- People protected from 1 in 100-year flood events under the Program (Number) of which female (Number)
- Improve access to navigability to 1,000+ DWT vessels in the Sava river (days per year)
- River basin management plan reflecting integrated measures updated and endorsed by countries (No/Yes)

Proposed Expected MPA Results and their Indicators for the MPA Program

COMPONENTS

| Current Component Name | Current Cost (US\$, millions) | Action | Proposed Component Name | Proposed Cost (US\$, millions) |
|---|-------------------------------|-----------|---|--------------------------------|
| Integrated Management and Development of the Sava River Corridor | 102.23 | Revised | Integrated Management and Development of the Sava River Corridor | 139.63 |
| Integrated Management and Development of the Drina River Corridor | 23.21 | Revised | Integrated Management and Development of the Drina River Corridor | 24.25 |
| Project Preparation and Management | 17.25 | Revised | Project Preparation and Management | 19.23 |
| Regional Activities | 8.81 | No Change | Regional Activities | 8.81 |
| TOTAL | 151.50 | | | 191.92 |

DISBURSEMENT ARRANGEMENTS

Change in Disbursement Arrangements

Yes

Expected Disbursements (in US\$)

| Fiscal Year | Annual | Cumulative |
|-------------|--------------|--------------|
| 2020 | 0.00 | 0.00 |
| 2021 | 1,335,747.21 | 1,335,747.21 |
| 2022 | 2,392,729.08 | 3,728,476.29 |
| 2023 | 3,696,457.59 | 7,424,933.88 |



| | | |
|------|--------------|---------------|
| 2024 | 5,366,455.71 | 12,791,389.59 |
| 2025 | 6,922,118.70 | 19,713,508.29 |
| 2026 | 7,550,049.99 | 27,263,558.28 |
| 2027 | 7,823,586.96 | 35,087,145.24 |
| 2028 | 5,442,854.76 | 40,530,000.00 |

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

| Risk Category | Latest ISR Rating | Current Rating |
|--|-------------------|----------------|
| Political and Governance | ● Substantial | ● Substantial |
| Macroeconomic | ● Substantial | ● Substantial |
| Sector Strategies and Policies | ● Moderate | ● Moderate |
| Technical Design of Project or Program | ● Moderate | ● Moderate |
| Institutional Capacity for Implementation and Sustainability | ● Substantial | ● Substantial |
| Fiduciary | ● Moderate | ● Moderate |
| Environment and Social | ● High | ● High |
| Stakeholders | ● Substantial | ● Substantial |
| Other | ● Substantial | ● Substantial |
| Overall | ● High | ● High |

LEGAL COVENANTS – Sava and Drina Rivers Corridors Integrated Development Program Additional Financing (P180507)

| Sections and Description |
|---|
| Loan Agreement, Schedule 1. Part A. Section 3.2. The Federation of Bosnia and Herzegovina shall provide support to: (a) increase the institutional capacity and inter-sectoral coordination in the Participating Beneficiaries to ensure a more efficient decision-making process and program management at the regional level; and (b) carry out Project management activities, including financial management and procurement, monitoring and evaluation, carrying out of audits, safeguards and implementation of grievance redress mechanisms, and reporting for Parts A.1.1, A.2.1 and A.3 of the Project. |
| Loan Agreement. Schedule 1. Part B. Section 3.2. The Brcko District shall provide support to: (a) increase the institutional capacity and inter-sectoral coordination in the Participating Beneficiaries to ensure a more efficient decision-making process and program management at the regional level; and (b) carry out Project management activities, including financial management and procurement, monitoring and evaluation, carrying out of audits, |



safeguards and implementation of grievance redress mechanisms, and reporting for Parts B1.1 and B.3 of the Project.

Loan Agreement. Schedule 2. Section II. The Borrower shall cause the Entity to furnish to the Bank each Project Report not later than forty-five (45) days after the end of each calendar semester, covering the calendar semester.

Loan Agreement. Schedule 2. Section I. B.1. Th Borrower through the Entities, shall prepare and furnish to the Bank, not later than October 30 of each year during the implementation of the Project, a proposed Annual Work Plan and Budget for the next calendar year containing: (a) all activities to be carried out under the Project during that calendar year; (b) a proposed financing plan for expenditures required for such activities, setting forth the proposed amounts and sources of financing; and (c) any training activities that may be required under the Project including: (i) the type of training; (ii) the purpose of the training; and (iii) the cost of the training.

Loan Agreement. Schedule 2. Section I. B.2. Th Borrower through the Entities, shall provide the Bank a reasonable opportunity to exchange views with the Borrower on each such proposed Annual Work Plan and Budget, and shall thereafter ensure that the Project is implemented with due diligence during said following year, in accordance with such Annual Work Plan and Budget as shall have been approved by the Bank; and not make or allow to be made any change to the approved Annual Work Plan and Budget without the Bank’s prior written approval.

Conditions

| Type | Financing source | Description |
|---------------|------------------|--|
| Effectiveness | IBRD/IDA | The Project Agreement for the Project Implementing Entity referred to in Section 9.01 of the General Conditions has been executed by its parties. |
| Effectiveness | IBRD/IDA | The Subsidiary Agreement between the Borrower and the Project Implementing Entity referred to in Section 9.01 of the General Conditions has been executed by its parties. |
| Effectiveness | IBRD/IDA | The Project Implementing Entity referred to in Section 9.01 of the General Conditions has adopted the POM in a manner acceptable to the Bank. |
| Disbursement | IBRD/IDA | Under the provisions of Part A, no withdrawal shall be made for payments made prior to the Signature Date. |
| Disbursement | IBRD/IDA | Under the provisions of Part A, no withdrawal shall be made under Category (1) unless: (i) the FBiH Project Agreement has been executed by its parties; (ii) the FBiH Subsidiary Agreement has been executed by its parties; and (iii) the FBiH POM has been prepared and adopted |



| | | by FBiH, in a manner satisfactory to the Bank. |
|----------------------|------------------------------|--|
| Type Disbursement | Financing source IBRD/IDA | Description Under the provisions of Part A, Category (2) unless: (i) the BD Project Agreement has been executed by its parties; (ii) the BD Subsidiary Agreement has been executed by its parties; and (iii) the BD POM has been prepared and adopted by BD, in a manner satisfactory to the Bank. |



VIII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Bosnia and Herzegovina

Sava and Drina Rivers Corridors Integrated Development Program Additional Financing

Project Development Objective(s)

The Objective of the Project (Phase I of the Program) is to improve flood protection and enhance transboundary water cooperation in the Sava and Drina Rivers Corridors.

Project Development Objective Indicators by Objectives/ Outcomes

| Indicator Name | PBC | Baseline | End Target |
|---|--|----------|------------|
| Enhance transboundary water cooperation | | | |
| River basin management plan reflecting integrated measures updated and endorsed by countries (Yes/No) | | No | Yes |
| <i>Action: This indicator has been Revised</i> | | | |
| Improved flood protection of the Sava and Drina River Corridors | | | |
| People protected from 1 in 100-year flood event in the Sava and Drina River Basins under the project (of which female) (Number) | | 0.00 | 270,000.00 |
| <i>Action: This indicator has been Revised</i> | <i>Rationale: Target for this indicator is increased due to protecting additional areas and people from floods in the Sava and Drina River Basins.</i> | | |



| Indicator Name | PBC | Baseline | End Target |
|--|--|----------|------------|
| Of which female (Number) | | 0.00 | 140,000.00 |
| <i>Action: This indicator has been Revised</i> | | | |
| Area protected by flood risk mitigation measures under the project (Hectare(Ha)) | | 0.00 | 165,000.00 |
| <i>Action: This indicator has been Revised</i> | <i>Rationale: Target for this indicator is increased due to protecting additional areas and people from floods in the Sava and Drina Basins.</i> | | |

Intermediate Results Indicators by Components

| Indicator Name | PBC | Baseline | End Target |
|--|--|----------|------------|
| Improved flood protection in the Sava and Drina River Corridors | | | |
| Length of embankments or dykes constructed or rehabilitated (Kilometers) | | 0.00 | 30.00 |
| <i>Action: This indicator has been Revised</i> | <i>Rationale: Target for this indicator is increased due to additional activities for construction and rehabilitation of the embankments and dikes in the Sava and Drina River Basins.</i> | | |
| Flood monitoring and forecasting system upgraded in a participatory manner, publicly disclosed and adjusted based on citizen engagement (Yes/No) | | No | Yes |
| <i>Action: This indicator has been Revised</i> | | | |



| Indicator Name | PBC | Baseline | End Target |
|--|--|----------|------------|
| Percentage of grievances responded and resolved within an agreed time frame (Percentage) | | 0.00 | 85.00 |
| Action: This indicator has been Revised | | | |
| Area protected by improved solid waste management (Hectare(Ha)) | | 0.00 | 31.50 |
| Action: This indicator is New | Rationale: <i>This new indicator measures the areas protected through construction or rehabilitation of the facilities for waste management under the project.</i> | | |
| Strengthened institutions and instruments to enhance transboundary water cooperation | | | |
| Enhanced monitoring/ data sharing protocols and schedules developed (Yes/No) | | No | Yes |
| Action: This indicator has been Revised | | | |
| Priority regional investments prepared (Number) | | 0.00 | 5.00 |
| Action: This indicator has been Revised | | | |
| Stakeholders consulted (of which female) and engaged during planning and preparation of project interventions (Number) | | 0.00 | 1,200.00 |
| Action: This indicator has been Revised | Rationale: <i>Target for this indicator is increased due to additional activities and involvement of new stakeholders to be consulted.</i> | | |
| of which female (Number) | | 0.00 | 510.00 |



| Indicator Name | PBC | Baseline | End Target |
|--|-----|------------|------------|
| <i>Action: This indicator has been Revised</i> | | | |
| Waterway improved through demining (Kilometers) | | 0.00 | 40.00 |
| <i>Action: This indicator has been Revised</i> | | | |
| Regional tourism master plan for the Sava and Drina Corridor that includes the establishment of a forum for women-headed SMEs is developed and endorsed.. (Yes/No) | | No | Yes |
| <i>Action: This indicator has been Revised</i> | | | |
| Number of annual multi-national stakeholder workshops held (Number) | | 0.00 | 12.00 |
| Enhancement of port facilities, services and logistics | | | |
| Freight throughput at the Sava river port of Sremska Mitrovica in Serbia (Tons/year) | | 234,465.00 | 300,000.00 |

Monitoring & Evaluation Plan: PDO Indicators

| Indicator Name | Definition/Description | Frequency | Datasource | Methodology for Data Collection | Responsibility for Data Collection |
|--|------------------------|-----------|---------------------------|---------------------------------|------------------------------------|
| River basin management plan reflecting integrated measures updated and endorsed by countries | | Yearly | Administrative records | Reported by the ISRBC | ISRBC |
| People protected from 1 in 100-year flood event in the Sava and Drina River Basins under the project (of which female) | | Yearly | Social monitoring reports | Reports by borrowers | National/entity PIUs and PMUs |



| | | | | | |
|--|--|--------|------------------------|----------------------------|-------------------------------|
| Of which female | | Yearly | Administrative records | Reported by borrowers | National/entity PIUs and PMUs |
| Area protected by flood risk mitigation measures under the project | | Yearly | Administrative records | Submitted by the borrowers | National/entity PIUs and PMUs |

Monitoring & Evaluation Plan: Intermediate Results Indicators

| Indicator Name | Definition/Description | Frequency | Datasource | Methodology for Data Collection | Responsibility for Data Collection |
|---|--|-----------|---|---------------------------------|------------------------------------|
| Length of embankments or dykes constructed or rehabilitated | | Yearly | Administrative records | Reported by the borrowers | National/entity PIUs and PMUs |
| Flood monitoring and forecasting system upgraded in a participatory manner, publicly disclosed and adjusted based on citizen engagement | | Yearly | Administrative records | Reported by ISRBC | ISRBC |
| Percentage of grievances responded and resolved within an agreed time frame | | Yearly | Administrative records | Reported by borrowers | National/entity PIUs and PMUs |
| Area protected by improved solid waste management | This indicator measures the area protected through construction or rehabilitation of the facilities for waste management under the project | Yearly | Construction reports, observation, and final report | Field visits and final reports | PIU Brcko |
| Enhanced monitoring/ data sharing protocols and schedules developed | | Yearly | Administrative records | Reported by ISRBC | ISRBC |



| | | | | | |
|---|--|--------|--------------------------|---|---|
| Priority regional investments prepared | | Yearly | Project design documents | Reported by borrowers | National/entity PIUs and PMUs |
| Stakeholders consulted (of which female) and engaged during planning and preparation of project interventions | | Yearly | Administrative records | Reported by borrowers | National/entity PIUs and PMUs |
| of which female | | | | | |
| Waterway improved through demining | | Yearly | Administrative records | Reported by Bosnia and Herzegovina Ministry of Communications and Transport | Bosnia and Herzegovina Ministry of Communications and Transport |
| Regional tourism master plan for the Sava and Drina Corridor that includes the establishment of a forum for women-headed SMEs is developed and endorsed.. | | Yearly | Administrative records | Reported by ISRBC | ISRBC |
| Number of annual multi-national stakeholder workshops held | | Yearly | Administrative records | Submitted by borrower | National/entity PIUs and PMUs |
| Freight throughput at the Sava river port of Sremska Mitrovica in Serbia | | Annual | Administrative reports | Submitted by borrower | PMU in Ministry of Construction, Transport and Infrastructure |



Annex 1: Economic and Financial Analysis

1. **A complete detailed technical analysis of project results is not feasible at this stage, but available data were evaluated.** Further, a financial and economic assessment carried out for a similar World Bank-financed project (Drina Flood Protection Project, P143844) confirmed that the reduction of expected losses due to floods would generate substantial economic benefits, thus justifying the investment. The assessment also showed that the project would contribute substantially to improving the livelihoods of poor communities in the project areas because it would substantially reduce losses of public infrastructure, agricultural and livestock production, and family household assets.
2. **On May 13, 2014, unprecedented floods inundated large areas of BiH, affecting more than a million people in 46 municipalities.** The floods displaced 89,981 residents, and reportedly, there were 25 casualties. The severe and widespread rains triggered over 3,000 landslides. The floods and/or landslides hit 75,000 houses; among them, 25,000 were severely damaged or completely destroyed. According to the Recovery Assessment conducted by the World Bank, United Nations, and European Union Civil Protection Mechanism, the damages related to livelihoods were estimated to be 626.4 million BAM or 390 million Swiss franc (CHF), damages related to housing were valued at 822.7 million BAM or 512 million CHF, damages in the health sector were estimated to be 11.3 million BAM (7 million CHF), and the damages related to water and sanitation facilities were estimated to be 10.6 million BAM (6.6 million CHF).¹³

Methodology for Economic Analysis

3. **Data could not be obtained for the entire area covered by this project, but assumptions were made on the basis of experience from similar projects.** The economic analysis applied the same methodology used in the original analysis, but with revised assumptions. For example, some of the original criteria used to estimate agricultural losses were revised to better reflect the existing situation and expected scenarios. A specific economic model in an extensive excel spreadsheet was built for each subcomponent and then aggregated for the components and the overall project investment. Because subcomponents with flood protection vary in size and coverage (that is, some have a very large number of houses or businesses, while others have fewer houses and more agricultural land), the benefits from reduced losses vary. For example, the Modrac subcomponent covers 5,330 houses, 700 apartments and 222 businesses affected by floods, suggesting most benefits will come from the avoided losses. In Component 3 in Brcko, District by contrast, most benefits come from protecting agricultural land from the expansion of agrobusiness.
4. **The analysis assumed an infrastructure construction period of two to three years for each of the proposed subcomponents (subprojects), and phasing of subproject construction.** No residual values were assigned at the end of the evaluation period because they would not influence the results, given that the discount rate would reduce this value substantially. A 30-year time horizon was used for the purpose of the analysis for the investment in flood protection, and a 20-year time horizon was used for

¹³ <https://reliefweb.int/report/bosnia-and-herzegovina/bosnia-and-herzegovina-floods-emergency-appeal-n-mdrba009-operations>



the BD landfill closure as well as for the construction of the new solid waste management facility. The financial and economic analysis used constant prices, and a six percent discount rate.

- 5. **Due to the competitive market for factors of production in BiH, the economic analysis did not consider significant price distortions.** The cash flow over market prices was used for the economic analysis primarily to correct the distortions from taxes, subsidies, or other financial transfers. The financial analysis focuses on beneficiaries’ family incomes, and how by reducing the expected losses (avoided damages) or improving the environment for agricultural production, the project would improve incomes. Moreover, an improved business enabling environment would generate revenue for business.
- 6. **For the investments related to protection from floods, avoided damages were calculated as the difference between damages caused in the existing situation vulnerable to frequent floods (without the proposed project) and the project scenario in which no damages would occur up to a certain magnitude of river overflows and flood events.** Because flood events occur in various degrees and frequency, the calculation considered the probability of occurrences of different flood intensities and the flood related damages weighted by the respective probability in both scenarios. A conservative approach was applied, using between 10 percent and 20 percent probability of flood occurrence, suggesting floods occur every 5 to 10 years, depending on the location.¹⁴ The analysis also assumed lower damages from floods than the historical average.¹⁵

Project Costs

- 7. **The main project costs are the investment costs financed by the World Bank project, other operational costs financed by farmers, and additional operation and maintenance (O&M) costs.** The project is divided into two main areas, namely BD and FBiH, and the analysis follows the same structure. Costs are expressed in million euro (Table A1.1), and the economic analysis was carried out in euro.
- 8. **The O&M costs of investment include those for continuous maintenance work, which assumes between 2 to 5 percent of overall investment costs.** Depending on the specifics of the investment, however, the O&M costs are longer term and mainly financed by non-World Bank sources.

Table A1.1 Project Costs by Component (000 euro)

| Description | Year 1 | Year 2 | Year 3 | Year 4 |
|----------------|-----------|-----------|-----------|--------|
| Brcko District | 9,644.65 | 8,984.67 | 6, 705.30 | |
| FBiH | 4,418.82 | 5,679.89 | 1, 947.99 | 54.07 |
| Total | 14,063.47 | 14,664.56 | 8, 653.29 | 54.07 |

Source: Project team

¹⁴ For investments in Modrac, Jala, and in Zeljeznica River near Vojkovići where the number of houses to be protected from floods is very large, we assumed a 10 percent probability of floods occurring every 10 years, a highly conservative approach, but still produces economically viable results.

¹⁵ Data on damages reported from 2010 and 2014 floods were used to compute the historical average.



Project Benefits

9. **The economic analysis considered costs and benefits from the country's perspective.** Costs and benefits were taken at market prices in most cases because there are very few market distortions in the value of assets, agricultural prices, and production costs. The following benefits are expected: (a) avoided damages related to agriculture production on lands likely to suffer from frequent floods; (b) avoided damages related to assets (including private houses, apartment houses, industrial facilities, roads, electric cables, schools, kindergartens, and health facilities); (c) avoided losses to businesses due to uninterrupted production, provision of services, communications, and traffic, among others; (d) avoided human health costs due to reduction of the pollution in the air and water supply systems, reduced water borne diseases, and reduced risks of human life losses; (e) increased recreational benefits including tourism development; (f) direct economic effects from the recycling of waste; and (g) indirect economic development effects.
10. **Avoided damages related to health and health improvements are the major benefits of the BD landfill closure, but they are not the only benefits.** For the landfill closure, the total number of people in the area is 20,000, of which 91 percent reported that they have been affected by the landfill. Thus, the calculation uses the number of people who reported to have been affected by the landfill and considers the average amount of 50 BAM (EUR 25) per person per year as a health benefit (medical treatment savings). Additional benefits from this investment will be generated by using the site for the industrial zone and commercial area in the future. While the health benefits are expected to be evident from year two, the business benefits from the industrial/commercial investments are expected to slowly emerge from year four onwards. There are also plans to use the area for a railway for Luka Brcko. However, it would take two decades for that potential benefit to materialize, and therefore was not part of the economic analysis.
11. **Health benefits are not the only benefits from the construction of a solid waste management facility in BD. There is value to recycling a large percentage (about 43 percent) of solid waste, and reducing the municipality's costs for waste disposal.** Incomes that enter the economic calculation of the system come from: (a) separating waste suitable for recycling, (b) producing compost, (c) reducing the volume of mixed municipal waste through dehydration, (d) reducing the volume of waste that needs to be transported to the landfill, and (e) increased income for the population through the sale of recyclables.
12. **The analysis considered the targets established for treating different categories of solid waste but only a few types were used in calculating the benefits of this investment.** The targets for the treatment of mixed municipal waste include: (a) 25 percent of biological inactive waste collected and deposited at the regional sanitary landfill at a cost of 37 BAM/ton; (b) 1 percent of the waste to be sold as secondary raw materials (mainly metals) at a price of 100 BAM/ton; (c) 54 percent of the waste to be used (free delivery) as refuse-derived fuel (RDF), a high-energy alternative fuel; and (d) 20 percent of the waste to undergo dehydration and decomposition through aerobic digestion of the organic material (release of heat). Goals for the treatment of separately collected recyclable municipal waste are accounted for in the calculation of income: (a) up to 40 percent of the recyclables would be sold to the market as secondary raw materials at a price of 200 BAM/ton; and (b) up to 60 percent of the waste would be used (with disposal costs or free delivery if possible) as an RDF. Goals for the treatment of separately collected biological waste are



provided for in the calculation of income: (a) 20 percent of biological inactive waste taken to be deposited at the regional sanitary landfill at a price of 37 BAM/ton; (b) 40 percent of waste to be used as compost at a price of 20 BAM/ton; and (c) 40 percent of the mass of waste separated through dehydration and decomposition in the process of aerobic digestion of organic matter (release of heat).

13. **Among the benefits of the proposed SWM investments, the few used in the economic analysis suggest strong economic viability of the investment.** The calculation used the benefits from short-term employment of 300 workers for the implementation of the investment, and the long-term employment of 32 employees that will work in the new waste management facility. In addition, benefits will include the sale of 1 percent of the waste that is expected to be sold as secondary raw materials (mainly metals) at a price of 100 BAM/ton. The calculation also considers sale of up to 40 percent of recyclables that are classified as separately collected recyclable municipal waste and other categories. When calculated together, they account for about 7 percent of total recyclable waste to be sold at price of 200 BAM/ton. Another main benefit used in the calculation is reduced waste disposal charges due to the smaller quantity of waste that needs to be deposited at the regional landfill, calculated at 43 percent of current costs.
14. **Avoided damages (avoided losses) are the main benefits of the investments in flood protection.** These were calculated as the difference between damages caused in the existing situation which is vulnerable to frequent floods (without the proposed project), and the “with project” scenario (where no damages would occur up to a certain magnitude of river overflows and flood events). Because flood events happen with varying frequency, the calculation considered the probability of occurrence at different flood intensities and flood-related damages by weighting the estimated damages by the respective probability in the “base” scenario and in the proposed protection level (“with project” scenario). Damages from floods above the proposed protection level are similar to those in the existing scenario, and thus were not considered in the economic analysis.
15. **Estimating avoided losses requires an hydraulic model and estimation of inundated areas for each flood event probability (return period).** Because hydraulic models are not available, the flooded areas were estimated by counting affected objects (assets) within the inundation area, and the agricultural (crops) data based on data received from the project preparation team. The number of inundated objects were then multiplied by the average value of the damage.¹⁶
16. **For the estimation of the value of avoided damages, the average price for affected houses was estimated to be 1,000 km/m2.** In case of direct flood damage on houses, the corresponding damages would be the costs of renovating the walls, floors, and electricity/phone cables (estimated at 20 percent of the costs of the building having the same surface area as the one affected by the flood), also taking into account irreversible damage to the furniture and household appliances. The value of damages to schools and other public buildings were calculated in a similar way. Considering the lack of data on health-related benefits, these effects were taken into account when estimating the benefits of expected avoided

¹⁶ On the part of the flooded area where adequate data were available, the average area of private houses has been determined as 100 m², like the calculations done for the economic analysis of the Drina Flood Protection Project in April 2014. This value was used during further calculations regarding the total area of private houses which was flooded in the area. As the prices today are much higher the whole calculation is considered conservative.



damages by the project by calculating minimum expected medication costs that would be avoided given the improvements in the environment.

17. **In the case of industrial/business assets, damages were estimated at 30 percent of the costs of the building considering irreversible damage to the industrial equipment.** The evaluation considered the indirect damages for companies due to the loss of added value and lower efficiency of work after the event. It also considered that above certain flood levels, up to 90 out of 265 working days in a year could be lost. For each facility, economic damages were evaluated as: 60/265 multiplied by the added value for each productive facility, estimated at 150,000 (km/ productive facility annually).
18. **Other social effects were largely excluded in the evaluation of specific project components.** These include: avoided traffic disruption, recreation benefits, tourism development, environmental protection (avoided replacement costs), loss of human life, and the avoided costs of private protection and economic development effects. The potential magnitude of these effects could be as high as the value of avoided damages. Although not accounted for in the analysis, the project will have additional social benefits, including: (a) increase in the number of jobs during construction; (b) increase in the number of jobs for maintaining the proposed works; and (c) creation of new jobs resulting from the economic development related to the implementation of the investment. The additional employment associated with project implementation is mainly a temporary effect because infrastructure investments are labor intensive, especially for excavation and construction.
19. **About 13,746.63 ha of land, including 4,076.6 ha of agricultural land and 9,670 ha of industrial land, will be protected from the risk of floods in the Sava River corridor in FBiH.** The main locations in FBiH to be protected are Novi Grad, Vogosca, Vojkovići, Modrac, Lukavac and Tuzla. Additional surface area will be protected in BD (near Kožara). The income security and living conditions of the land holders along the proposed structures will improve because crops will be more regular and reliable with fewer losses due to less re-seeding, fewer complete crop failures, and expansion of agricultural land. Crop budgets for the main agricultural activities and farm models were developed for quantifying the financial impact of the project on beneficiaries, based on average yields, costs of production, and cropping patterns. Recurrent floods affect 10 to 15 percent of average yields of crops. Technical estimates show that farmers' net income could increase from 12 to 40 percent on average in the case of field crops (wheat, barley, maize and fodder crops), and from 15 to 80 percent in the case of fruits and vegetables (open field and/or under greenhouses).¹⁷
20. **Farm models combining typical cropping patterns that represent the farming systems in the project areas show an increase in the net incomes of farmers in the protected areas.** Because the risk of floods is minimized and conditions to intensify production allow for more intensive cropping in farms with reduced risks, their family revenues would improve substantially. With flood protection, moreover, the reduction of assets lost by floods will contribute to improving their livelihoods. The farm models show that farmers in the project areas where risks of floods will be reduced (mainly family farms or small farmers) could increase their net incomes by 60 to 80 percent.

¹⁷ Due to lack of specific farm data, these calculations are used as proxy based on the analysis carried out for the Drina Flood Protection Project, which has similar features to this project.



21. **Most benefits are difficult to measure because critical data are not available.** However, based on the estimates provided in the available information about the flood area, and the corresponding probability of occurrence in each of the project sites, it was possible to estimate the average expected annual avoided losses with a damage frequency curve. The benefits related to the avoided damages to private houses, industries, and public facilities were estimated on the basis of the consultants' methodology. A conservative approach was applied across all sub-components, assuming a smaller amount of damage than the historical data from past floods (2010 and 2014) suggest.

22. **The main benefits from the investments in FBiH will be generated from avoidance of flood damages related to houses, apartments, businesses, and other infrastructure.** The assets to be protected include 8,029 houses, 750 apartments, 353 businesses, 17 schools, 15 community centers, 11 houses of worship, 24 km of railway, 82.8 km of local roads, 3 km regional roads, 43.7 km highway, and 10 bridges (Table A1.2). There are also 4,076 hectares of agricultural land to be protected in FBiH. These consist of 136.6 hectares cultivated with fruits, 858.5 hectares with vegetables, 1,245 hectares with crops, and 1,837 hectares of pastures. About 250 hectares or 6 percent out of these 4,076 are assumed to be added to agricultural cultivation after protection from floods, which is a direct benefit for farmers because they will be able to cultivate their land and add to their income. The data also suggest that another 9,670 hectares of industrial land will be protected from floods. Out of the total, 560 hectares or about 6 percent will be added as new industrial land.

Table A1.2. Current Situation and Expected Impact of Component 1 Investments in FBiH

| Ref.No. | Description of Assignment/Activity | Phase | length of rehabilitation (m) | number of beneficiaries | of which female % | Agricultural land (ha) | | | | | | | | Industrial land (ha) | | Residential buildings | | Business objects | Public structure | | | | Infrastructure (m) | | | | | | | | |
|--|--|-------|------------------------------|-------------------------|-------------------|------------------------|-------|------------|-------|-----------|--------|-----------|--------|----------------------|-------|-----------------------|-------|------------------|------------------|--------------------|-----------|------------------|--------------------|--------------|-------|----------|---------|---------|---|---|---|
| | | | | | | Fruits | | Vegetables | | Crops | | Pastures | | currently | after | currently | after | | Private houses | Private apartments | Schools | Community Center | Religious objects | Railway line | Roads | | | Bridges | | | |
| | | | | | | currently | after | currently | after | currently | after | currently | after | currently | after | currently | after | | currently | after | currently | after | currently | after | local | regional | highway | Bridges | | | |
| Regulation of Bosna River in the Federation of BiH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1 | Regulation of Bosna riverbed in Sarajevsko polje in municipality Novi Grad (LB + RB) | 1 | 1080 | 721 | 50 | | | | | | | | | | | 135 | | 156 | NA | 20 | | | 1 | 1 | | | 1000 | 1000 | | | 2 |
| 1.2 | Regulation of Bosna riverbed from bridge in Svrake in municipality Vogošća upstream in the total length of 1,500 m (LB + RB) | 1 | 1500 | 130 | 42 | 1,5 | 1,5 | 3,5 | 3,5 | | | | 3,0 | 3,0 | | | | 30 | | 10 | | | | | | | 1341 | | | | 1 |
| Regulation of Željeznica River in the Federation of BiH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.3 | Regulation of Željeznica River from bridge in Butmir next to the entity border in Vojkovići (LB + RB) | 1 | 1800 | 8564 | 50 | 4,1 | 4,1 | | | | | | 213,0 | 213,0 | | | | 2213 | 50 | 21 | 1 | 1 | 2 | | | 16298 | | | | 1 | |
| Spreča River / accumulation Modrac in the Federation of BiH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.4 | Rehabilitation of the lake Modrac dam – IV phase | 1 | NA | 26900 | 51 | 100,0 | 120,0 | 800,0 | 850,0 | 1120,0 | 1220,0 | 1500,0 | 1530,0 | 9010 | 9510 | 5330 | 700 | 272 | 16 | 13 | 8 | 22000 | 59500 | 2000 | 42500 | 12 | | | | | |
| Regulation of Jala River (Lukavac) in the Federation of BiH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.5 | Rehabilitation of the Jala riverbed (LB + RB) / municipalities Lukavac and Tuzla | 1 | 1200 | 18000 | 60 | 1,0 | 11,0 | 0,0 | 5,0 | 5,0 | 25,0 | 46,0 | 91,0 | 100 | 160 | 300 | | 30 | | | | | | | 2000 | 4700 | | 1200 | 1 | | |

Source: Project team

Economic Analysis Results

23. **The overall economic assessment shows that the project would have an ERR of 17.7 percent.** The proposed investments will reduce the frequency and related costs of flooding events to the communities as well as to the local and central governments. It will also produce better environmental and health outcomes after the closure of the landfill and investment in SWM in Brcko. Agriculture, industry, tourism, and other livelihood and economic activities will become more attractive for private investments because climate-related risks will be substantially reduced. Based on the estimated project investment, operating costs, and the value of avoided damages, together with expected increase in private investments because the risks of flooding are mitigated, the ERR for the proposed investments for the Brcko area is expected



to be 17.3 percent; for FBiH, an ERR 18.2 percent is expected. For sub-component 1 in Brcko (landfill), an ERR of 13.3 percent is expected, and for the SWM sub-component of the Brcko component, an ERR of 17.8 percent is expected (see Table A1.3). For the sites in the FBiH areas (Novi Grad, Vogoska, Modrac, Jala, and Vojkovići), sub-component 1.1 in FBiH has an ERR ranging between 7.6 percent in Jala and 69.0 percent in Modrac, averaging 26.6 percent for the entire sub-component. For the entire FBiH component, the ERR averages 17.7 percent, well above the discount rate of 6 percent (Table A1.3). The benefit to cost (B/C) ratios for all project components and sub-components are above 1; the average B/C for the whole project is 2.5.

Table A1.3. Expected Project Results

| | NPV (in 000 EUR) | ERR | B/C |
|------------------------|------------------|-------|-----|
| Total project | 79,624 | 17.7% | 2.5 |
| Brcko total | 45,255 | 17.3% | 2.3 |
| FBiH total | 34,370 | 18.2% | 2.8 |
| Brcko 1 (Landfill) | 5,976 | 13.2% | 2.1 |
| Brcko 2 (SWM) | 16,238 | 17.8% | 2.4 |
| Brcko 3 (water stream) | 3,357 | 23.5% | 6.2 |
| Brcko 4 (Kožara) | 1,729 | 9.2% | 1.2 |
| Brcko 5 (Sidewalk) | 9,006 | 19.8% | 2.3 |
| FBiH 1 | 35,894 | 24.1% | 3.9 |
| FBiH 1.1 | 34,469 | 26.6% | 4.0 |
| FBiH 1.2 | 1,888 | 8.5% | 2.9 |
| FBiH 2 | 887 | 9.4% | 1.9 |

Source: World Bank Consultant calculations

Note: FBiH total NPV is smaller than the sum of FBiH1 and FBiH2 because it also includes the unallocated budget as its costs

24. **The sensitivity analysis suggests that the investment is economically viable and strong, even under worse case scenarios.** After testing for 20 percent lower benefits and 20 percent higher costs, the overall average B/C ratio of 1.7 suggests that the project is economically viable, despite the ERR of 7.9 percent. Two worst case sensitive scenarios also were computed: (a) a 10 percent decline in benefits, and at the same time, a 10 percent increase of overall costs (including investment costs); and (b) a 20 percent decline in benefits with a 20 percent increase in overall costs. In both cases, the overall project average for B/C and the averages for both BD and FBiH show good project performance. Using a 20 percent scenario, the ERR was 8.6 percent for BD and 6.9 percent for FBiH, thus producing a total project average of 7.9 percent. Although all tested sub-components in the 10 percent sensitivity test resulted in an ERR over 12 percent and an average B/C of 2.1, they were more sensitive in the 20 percent sensitivity test (especially the Brcko – Kozara site which had a B/C of less than 1 in both sensitivity tests) (Table A1.4).



Table A1.4. Results of Stress Tests for Main Components and Their Sub-Components

| | ERR baseline | ERR 10% | ERR 20% | B/C baseline | B/C 10% | B/C 20% |
|------------------------|-----------------|------------|------------|-----------------|------------|------------|
| Total project | 17.7% | 12.4% | 7.9% | 2.5 | 2.1 | 1.7 |
| Brcko total | 17.3% | 12.6% | 8.6% | 2.3 | 1.9 | 1.5 |
| FBiH total | 18.2% | 12.2% | 6.9% | 2.8 | 2.4 | 1.8 |
| Brcko 1 (Landfill) | 13.2% | 10.1% | 7.3% | 2.4 | 1.9 | 1.6 |
| Brcko 2 (SWM) | 17.8% | 12.9% | 9.1% | 2.4 | 2.0 | 1.6 |
| Brcko 3 (water stream) | 23.5% | 16.0% | 9.8% | 6.2 | 4.4 | 2.9 |
| Brcko 4 (Kožara) | 9.2% | 6.4% | -2.2% | 1.2 | 0.9 | 0.7 |
| Brcko 5 (Sidewalk) | 19.8% | 13.5% | 8.9% | 2.3 | 1.9 | 1.6 |
| FBiH 1 | 24.1% | 16.0% | 9.4% | 3.9 | 2.8 | 2.0 |
| FBiH 1.1 | 26.6% | 17.5% | 10.2% | 4.0 | 2.9 | 2.1 |
| FBiH 1.2 | 8.5% | 6.9% | 5.3% | 2.9 | 2.4 | 2.0 |
| FBiH 2 | 9.4% | 6.2% | 3.4% | 1.9 | 1.6 | 1.3 |



Table A1.5. Sample for Illustration of the Economic Model Used for FBiH Sub-Component 1.1

| Sub-Component 1.1: Flood protection and environmental management | | | | | | | | | | | | | |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| ECONOMIC BUDGET (AGGREGATED) | | | | | | | | | | | | | |
| (In BKM '000) | | | | | | | | | | | | | |
| | Without Project | | With Project | | | | | | | | | | |
| | 1 to 20 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 to 20 | 21 to 30 |
| Main Production | | | | | | | | | | | | | |
| Fruits | 304 | 304 | 309 | 321 | 334 | 346 | 366 | 374 | 379 | 383 | 387 | 390 | 392 |
| Vegetables | 2 445 | 2 445 | 2 501 | 2 622 | 2 693 | 2 699 | 2 702 | 2 705 | 2 707 | 2 708 | 2 708 | 2 708 | 2 708 |
| Crops | 1 238 | 1 238 | 1 263 | 1 305 | 1 337 | 1 337 | 1 337 | 1 337 | 1 337 | 1 337 | 1 337 | 1 337 | 1 337 |
| Pastures | 794 | 794 | 809 | 826 | 845 | 852 | 859 | 866 | 873 | 880 | 888 | 888 | 888 |
| Private Houses Avoided Damages (Gorazde) | - | - | 392 | 783 | 5 963 | 5 979 | 5 995 | 6 011 | 6 028 | 6 045 | 6 062 | 6 062 | 6 062 |
| Private Apartments Avoided Damages (Gorazde) | - | - | - | - | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| Schools & Public Structures Avoided Damages (Gorazde) | - | - | - | 35 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 272 | 275 |
| Other Economic and social benefits | - | - | - | 10 | 15 | 15 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| Industrial Facilities Avoided Damages (Gorazde) | - | - | 163 | 325 | 865 | 842 | 848 | 855 | 858 | 860 | 863 | 863 | 863 |
| Sub-total Main Production | 4 780 | 4 780 | 5 436 | 6 227 | 12 715 | 12 733 | 12 790 | 12 832 | 12 866 | 12 899 | 12 932 | 12 937 | 12 942 |
| Production Cost | | | | | | | | | | | | | |
| Investment | | | | | | | | | | | | | |
| Purchased Inputs | | | | | | | | | | | | | |
| Seeds/Seedlings | - | - | - | - | 65 | 65 | - | - | - | - | - | - | - |
| Fertilizers | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Agrochemicals | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Irrigation Costs | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Process Inputs | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Land Aquisition | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Embarkment Construction | - | 4 911 | 6 511 | 3 508 | - | - | - | - | - | - | - | - | - |
| On Farm Investments | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sub-Total Purchased Inputs | - | 4 911 | 6 511 | 3 508 | 65 | 65 | - | - | - | - | - | - | - |
| Labor | | | | | | | | | | | | | |
| Labor | - | 95 | 134 | 9 | - | - | - | - | - | - | - | - | - |
| Sub-total Investment Costs | - | 5 006 | 6 645 | 3 517 | 65 | 65 | - | - | - | - | - | - | - |
| Operating | | | | | | | | | | | | | |
| Purchased Inputs | | | | | | | | | | | | | |
| Seeds/Seedlings | 35 | 35 | 47 | 53 | 47 | 44 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| Fertilizers | 143 | 143 | 145 | 154 | 164 | 164 | 164 | 164 | 164 | 164 | 164 | 164 | 164 |
| Agrochemicals | 256 | 256 | 260 | 242 | 224 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 |
| Irrigation Costs | 217 | 217 | 219 | 249 | 284 | 284 | 284 | 284 | 284 | 284 | 284 | 284 | 284 |
| Process Inputs | - | - | - | - | - | - | - | - | - | - | - | - | - |
| On Farm Investments | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Operation & Maintenance of Structures | - | 210 | 475 | 594 | 594 | 594 | 594 | 594 | 594 | 594 | 594 | 594 | 594 |
| Sub-Total Purchased Inputs | 651 | 860 | 1 147 | 1 292 | 1 313 | 1 310 | 1 308 | 1 309 | 1 309 | 1 309 | 1 309 | 1 309 | 1 309 |
| Labor | | | | | | | | | | | | | |
| Labor | 9 | 69 | 129 | 114 | 115 | 115 | 115 | 115 | 115 | 116 | 116 | 116 | 116 |
| Sub-total Operating Costs | 660 | 929 | 1 276 | 1 406 | 1 427 | 1 424 | 1 423 | 1 424 | 1 424 | 1 424 | 1 424 | 1 425 | 1 425 |
| Sub-Total Production Cost | 660 | 5 935 | 7 921 | 4 923 | 1 492 | 1 489 | 1 423 | 1 424 | 1 424 | 1 424 | 1 424 | 1 425 | 1 425 |
| OUTFLOWS | 660 | 5 935 | 7 921 | 4 923 | 1 492 | 1 489 | 1 423 | 1 424 | 1 424 | 1 424 | 1 424 | 1 425 | 1 425 |
| Cash Flow | 4 121 | -1 155 | -2 484 | 1 304 | 11 223 | 11 244 | 11 366 | 11 408 | 11 442 | 11 475 | 11 508 | 11 513 | 11 518 |
| CF With project minus Without project | | -5 276 | -6 605 | -2 816 | 7 102 | 7 123 | 7 246 | 7 287 | 7 321 | 7 355 | 7 387 | 7 392 | 7 397 |

Source: World Bank Consultant calculations