

ANNEX 18

MTR and TE Reports

Scaling up climate resilient flood risk management in Bosnia and Herzegovina

29 April 2020

Midterm Review (MTR) of the UNDP-
supported GEF-financed project

Technology Transfer for Climate Resilient
Flood Management in Vrbas River Basin

PIMS#5241

GEF Project ID:5604

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Acronyms and Abbreviations

AMAT	Adaptation Monitoring and Assessment Tool
ATLAS	Enterprise Resource Planning (ERP) system that integrates all of UNDP's data and processes, including budgets, accounting and auditing.
AWP	Annual Work Plan
BAM	Bosnian Mark
BiH	Bosnia and Herzegovina
CC	Climate Change
CPD	Country Programme Document
CRFRM	Climate Resilient Flood Risk Management
DEM	Digital Elevation Model
DIM	Direct Implementation Modality
EC	European Commission
EIB	European Investment Bank
EU	European Union
FBiH	Federation of Bosnia and Herzegovina
FFEWS	Flood Forecasting and Early Warning System
FRM	Flood Risk Management
FRMP	Flood Risk Management Plan
GCM	General Circulation Model
GDP	Gross Domestic Product
GEF	Global Environmental Fund
GIS	Geographical Information System
HR	Human Resources
H&S	Health and Safety
INC	Initial National Communication
INSPIRE	Infrastructure for Spatial Information in the European Community
IPA	European Union Instrument for Pre-Accession Assistance
IPCC	Intergovernmental Panel on Climate Change
LiDAR	Light Detection and Ranging
MoFTER	Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina
MTR	Mid Term Review
N/A	Not Applicable
NGO	Non-Governmental Organization
O&M	Operation and Maintenance
PEB	Project Evaluation Board
PGIS	Participatory Geographical Information System
PIMS	Project Information Management System
PIR	Project Implementation Review
PIU	Project Implementation Unit
PM	Project Management
RCP	Representative Concentration Pathways
RIMAX	Risk Management for Extreme Flood Events project
RS	Republika Srpska
SBAA	Standard Basic Assistance Agreement
SCCF	Special Climate Change Fund
SIDA	Swedish International Development Cooperation Agency

SMART	Specific, Measurable, Attainable, Relevant, Time-bound
SNC	Second National Communication
ToR	Terms of Reference
UNDAF	United Nation Development Assistance Framework
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VRB	Vrbas River Basin
WB	World Bank
WBIF	Western Balkans Investment Framework

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1 Executive Summary

1.1 Project Information Table

Project Title:	Technology transfer for climate resilient flood management in Vrbas River Basin		
Country(ies):	Bosnia and Herzegovina	GEF Project ID:	5604
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5241
Other Executing Partner(s):	Bosnia and Herzegovina Ministry of Foreign Trade and Economic Relations	Submission Date:	January 22, 2014
GEF Focal Area (s):	Climate Change Adaptation	Project Duration (Months)	60

1.2 Project Description

The "Technology transfer of climate resilient flood management in Vrbas River Basin" project is a 5-year 5 mill USD SCCF funded project with the objective to transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin. Adaptation technologies for climate resilient Flood Risk Management (FRM) include the development of state-of-the-art hydrological and hydrodynamic models and GIS tools for the Vrbas River Basin incorporating climate change predictions and producing flood hazard maps as the basis for spatial planning and long-term strategic FRM. The project includes the upgrade and rehabilitation of the hydrometric network, and the harmonization and centralization of the hydrometric database. The project also develops the flood forecasting system and enhance the existing early warning system within the VRB. Emergency response is being enhanced through the development of emergency response plans, and provision of training in flood-specific civil protection are provided. Further, an institutional capacity development plan for the long-term development of capability and capacity in FRM is developed. The project works closely with affected communities to introduce climate resilient community-based non-structural measures and provides training to local communities in climate resilient FRM.

1.3 Project Progress Summary

The project has made significant progress and is on target with regard to most of its objectives to transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin. Achievements include the setup and operationalization of a hydro-meteorological network consisting of 7 hydrological, 2 meteorological and 20 rain gauges; the development of a climate change model for Vrbas River Basin; the development of hydrological and hydrodynamics models (including 2D model for the whole basin); completion of hydrological and hydraulic models for flood forecasting; completion of vulnerability assessment, including

gender segregated data and development of flood depth-damages curve; identification of the first set of non-structural measures, which will be implemented in Vrbas River Basin. The project finalized flood hazard and risk maps for 20-, 100- and 500-year return periods for Vrbas River Basin, which have, after ground truthing, been accepted by relevant authorities. In addition to these maps, the project has, for the first time in BiH, developed torrential flood sensitivity models for the whole basin, which also included erosion maps. Significant progress has been made in data management with a) the establishment of a geoportal that links spatial data infrastructure and hydro-meteorological data and b) the upgrade and population of an existing obsolete water information system, that now for the first time in BiH enables automatic exchange of information among all three water agencies in Bosnia and Herzegovina. In addition, the system provides access for the ministries of water management to the available information.

Critical aspects include the development of flood risk management plans for which the legal and regulative framework is lacking, agroforestry measures that have been found more expensive than anticipated as well as difficulties in developing flood insurance schemes, as index-based insurance is not known to local legislation and respectively there is a lack of interest from the local insurance industry. The project has identified the related problems and is working towards solutions.

The project budget as per budget revision of 30. October 2017 shows a total of 5,282,140 USD, i.e. 282,140 USD additional funding added to the original 5,000,000 USD of which 47.6% have been disbursed till 20 Nov 2017. This additional funding of USD 282,140 is municipal contributions for implementation of flood risk measures. Co-financing from the Ministry of Agriculture, Forestry and Water Management, Sava River Basin Water Agency and UNDP, as indicated in the Project Document, show disbursement of 57%. The recorded and planned spendings are within budget and plausible given the overall project budget as well as implementation rate.

1.4 MTR Rating and Achievement Summary

Justification for project rating for each outcome has been given in the section 4.2. when explaining progress towards outcomes and outputs.

Measure	MTR Rating	Achievement Description
Project Strategy	Strategy: S	The project was designed to reduce flood risk management and increase resilience of the most vulnerable groups, which involved a wide range of stakeholders from policy makers to the flood exposed population. Apart from the critical aspects stated in Section 1.3, design is good, and the project is accepted and endorsed by the key partners who recognize its importance. The combination of technical work, new technologies and instruments, with practical on-the-ground implementation is greatly appreciated by all stakeholders.

		The project clearly addresses national priorities as well as conforming to the global guidelines of the SCCF.
Progress Towards Results	Objective: HS	The project started with introduction of the new technologies at early stages and established an automated hydrometric monitoring network covering the Vrbas River Basin, which is 12 % of BiH's territory. It has become a flagship project in the country with technology transfer as it takes a systematic and holistic approach to flood risk management starting with data systematization within the water information system, via hydrological and hydraulic modelling which present a base for the flood forecasting and early warning system as well as flood mapping. This in turn creates a base for flood damage modeling, flood zoning, flood insurance scheme, flood risk management planning and identification and selection of flood risk management measures.
	Outcome 1: HS	The project has made good progress with development and scaling up of the methodology for flood hazard and flood risk mapping, transposing of EU Flood Directive into local Water Law, establishment of an inter-agency working group consisting of the core institutions relevant for flood risk management risk, enabling regular data exchange and boosting cooperation between water agencies through a Water Information System, initiation of the development of a flood zoning policy as well as flood forecasting and early warning system set-up.
	Outcome 2: HS	The project has put significant efforts to enable technology transfer and strengthen institutional capacities. After digitization of available data and development of hydrological models which include climate change scenarios developed for the Vrbas River Basin in line with IPCC scenarios, 2D hydraulic models have been developed for the whole basin. These models, which represent a significant technological step-up in BiH served as a base for development of flood hazard and risk maps for 20-, 100- and 500-year return periods. The maps were developed in line with the EU Flood directive and for the first time in BiH. Also, for the first time, a torrents register has been set up and a torrents susceptibility model developed. Vrbas River Basin Spatial Data infrastructure has been developed and it serves to store, maintain and manage all information pertaining to the project to provide access to data for technical specialists and decision makers. Constant education of professionals is ongoing. Flood loss and damage

		modelling has been finalized and GIS representation of loss-damage curves is in progress.
	Outcome 3: S	Up to the MTR date, the project has managed to fulfil its scheduled tasks: developing the agro-forestation scheme for Vrbas River Basin with concrete proposals for agro-forestry measures, identifying and starting with implementation of non-structural measures, establishing a participatory GIS, developing a community engagement strategy etc. The main challenges for further project implementation have been identified under this outcome as: Cost of agro-forestation measures, no legal ground for introduction of index-based insurance and unclear regulatory framework and non-existence of necessary laws for development of the flood risk management plan.
Project Implementation & Adaptive Management	Highly Satisfactory (HS)	All key stakeholders interviewed were very satisfied not only with the project results, but also with the way the project was managed. Project management has been successful in bringing on board and maintaining interest of key stakeholders as well as beneficiaries on all levels. The project took a good start by adjusting its activities and conducting LiDAR geodetic survey, thus becoming a country lead in flood hazard mapping and yet staying within anticipated budget. The project is actively adapting its management to overcome delays related to the development of flood risk management plan (FRMP) for the reasons beyond the control of the project. However, the project is well positioned to develop the first pilot FRMP for the Vrbas River Basin for further replication in the other basins of the country. An adaptive approach is required to adjust flood insurance scheme to Bosnia and Herzegovina circumstances and the project has been doing it so far, by analyzing the situation on the ground and creating a network of stakeholders including from the private sector, i.e. insurance companies, to come up with the best applicable insurance model for BiH. Implementation of agro-forestry measures will also require an adaptive approach as costs significantly exceed the budget anticipated in the Project Document.
Sustainability	Moderately Likely (ML)	Sustainability is rated as moderately likely due to the fact that that currently there is no budget available for long term capital intensive maintenance as well as suitable staffing. Legal adjustments and suitable funding sources would be necessary to allow for sustainable financing. This was clearly voiced by stakeholders. Although not financially sufficient, there is certain progress in this direction, as stakeholders

		have expressed an interest to upscale project results and understand that they have not shown their commitment and capability to do so.
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1.5 Summary of Conclusions and Recommendations

This is a flagship and ground-breaking project for Bosnia and Herzegovina in a technical and institutional way. From a technical aspect the project has for the first time introduced climate change in hydrological modelling, did 2D hydraulic modelling, developed a torrents susceptibility model as well as introduced a flood forecasting and early warning system (FFEWS). The methodologies for the flood mapping and the FFEWS platform have been/will be replicated for other river basins in the country. From an institutional aspect the project introduced climate changes into the Water Law and established systematic data exchange between three water agencies, covering the whole country, not only the Vrbas river basin.

The project design, strategy and results achieved to date have been recognized by the GEF and UNDP by selecting this project for their publication "Voices of Impact: Speaking for the Global Commons" published to celebrate 25 years of GEF and 50 years of UNDP.

Based on the analysis of project progress, the need for ensuring project sustainability as well as the need to increase project benefits have become obvious. Recommendations are respectively formulated as follows:

<u>Problem</u>	<u>Recommendation</u>	<u>Responsible entity and timeline</u>
Where new technologies have been introduced, stakeholders/beneficiaries have been given the necessary basic training, but experience is lacking	Repeating exposure through on-the-job training is necessary to ensure long term sustainability of the new technologies.	Project management, supporting beneficiaries, during project duration
Stakeholders have shown a general understanding of the project concept of tackling the flood problems in BiH. Nevertheless, modern concepts like "living with floods" have not precipitated through to all involved institutions	More emphasis, capacity building and knowledge transfer regarding "making room for water" and/or "living with floods" concepts to beneficiaries would be highly beneficial in order to enable these beneficiaries to further develop means for holistic flood management in their jurisdictions.	Project management team to emphasize this approach in further capacity building activities, during project duration
Despite clear interest and willingness of the involved stakeholders, long term financial sustainability with regards to	The government of BiH as well as entities and municipalities will need to find ways and conduct the	Project management to provide advise to stakeholders.

operating and maintaining the project results is not given within BiH (operation / maintenance / capital investments).	necessary legal adjustments to collect and/or allocate the necessary funds to ensure long term sustainability of the flood protection, adaptation and warning interventions. It is expected that capital intensive maintenance and replacement works will become necessary in the future that will need respective financing. Financing will need to cover both capital costs and staffing costs. The project is to develop a sustainability strategy with as exact as possible financial projections in cooperation with the respective stakeholders.	Sustainability strategy to be developed till the end of 2019
Stakeholders are interested in upscaling project results also to other basins in BiH.	Guidelines for potential upscaling including lessons learnt should be produced. Upscaling of project methodologies and results should be done through concrete project proposals covering other flood prone river basins in Bosnia and Herzegovina.	Depending on funds availability, project management to develop guidelines and project proposal
Agroforestry measures have not yet been implemented as more expensive than anticipated	Explore implementation of agro-forestry measures with direct involvement of beneficiaries e.g. project to provide seedlings and municipality or farmers to provide labour for planting.	Project management To start immediately
Flood risk management planning has not yet been conducted due to the lack of regulative and legal framework based on missing political consensus	The project should support development of by-laws that will regulate the development of the flood risk management plan and continue with the development of the Vrbas river basin flood risk management plan as a pilot for the rest of BiH.	Project management to develop ToR and obtain consent from relevant institutions

Flood insurance schemes have not yet been implemented due to the lack of relevant legislation for index-based insurance and poor interest among population at risk, thus resulting in low interest from insurers in BiH	Insurance models with applicable tariffs to be developed and discussed with stakeholders. Simulation of the model can be initiated in pilot municipalities. In order to ensure necessary insurance take-up, the 'solidarity' approach for financing should be explored.	Project management
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2 Introduction

UNDP has requested for carrying out a Mid Term Review (MTR) for the "Technology transfer of climate resilient flood management in Vrbas River Basin" project. The approach for the MTR is clearly laid out by the detailed ToRs for the MTR consultant and follows the specified UNDP "Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects" document. In this regard, the MTR assesses progress towards the achievement of the project objectives and outcomes as specified in the Project Document and assesses early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR also reviews the project's strategy and its risks to sustainability. To achieve these objectives, the review is conducted in close cooperation with the client, the project team, stakeholders and beneficiaries. Based on a thorough understanding of the project ToR and objectives and the institutional and policy framework in BiH, the project is thoroughly assessed. Main activities include document reviews, various interactive interviews and drafting the resulting reports.

3 Background context and project description

3.1 General context

Bosnia and Herzegovina (BiH) is a middle-income country with an estimated 3.8 million inhabitants. The 1992-1995 war has had a devastating impact on its human, social and economic resources, leading to enormous challenges of the post-war reconstruction and economic and social recovery. This challenge has been further compounded by the transition towards market economy requiring structural reforms and improved governance.

Due to the war time devastation and the unsuccessful transition of economy, a large part of Bosnia and Herzegovina's population still lives in poverty. The slow rate of the post-war economic recovery of Bosnia and Herzegovina has been compounded by the negative impacts of climate change on key sectors such as agriculture, energy (hydropower), the environment and, in particular, the frequency and magnitude of flood disasters, which have tripled in frequency in the last decade¹. In 2010 - the second largest flood on record - damages were US\$ 200 million which is approximately 1% of GDP. In May 2014, Bosnia and Herzegovina experienced its worst flooding in 150 years which resulted in 23 deaths and US\$2.7 Billion worth of damages which is 15% of GDP.

The risk assessment report adopted by the Council of Ministers in 2011, emphasized that BiH is significantly exposed to the threats of climate change. Furthermore, the country has very limited capacity to adapt to address climate risks². Both the BiH's Initial National Communication (INC) and the Second National Communication (SNC) to UNFCCC have identified that climate change is affecting Bosnia and Herzegovina and will accelerate during the remainder of the twenty-first century. This trend will lead to an increased likelihood of floods as the frequency of intense rain events is projected increases. Respective impacts have already been observed in the project target area – the Vrbas River Basin (VRB) – with the most damaging being flooding.

3.2 Problems and vulnerabilities in the basin

The municipalities of the Vrbas Basin are among the worst war devastated municipalities in BiH, which, 18 years after the war, are still struggling to re-establish normal living conditions and to repair physical and societal war damage. Post-war societal issues are manifested in the form of deep ethnic divisions and mistrust. Despite these problems, many municipalities have successfully undergone ethnic reconciliation and reintegration, but are still struggling with the economic recovery.

Vrbas River Basin is located in north western BiH and extends, fully or partially, throughout the area of 28 administrative municipalities within BiH. The total area of the VRB is 6,386 km² which is 12.5% of the entire BiH territory, 63% of which is located in the Republika Srpska (RS) and 37% in the Federation of Bosnia and Herzegovina (FBiH). The Vrbas River is a right tributary of the Sava River, which is in turn a right tributary of the Danube River. The VRB is

¹ Climate Changes and Water Management in Bosnia and Herzegovina with Special Focus on Flood Protection, Igor Palandzic, Sarajevo 2012, <http://www.scribd.com/doc/112546672/KLIMATSKE-PROMJENE-I-VODNI-RESURSI-U-BOSNI-I-HERCEGOVINI-Climate-Changes-and-Water-Resources-in-Bosnia-and-Herzegovina>

² Risk assessment of vulnerability BiH to natural and other disasters, Ministry of security of BiH.

typified by mainly mountainous relief. There are relatively little lowlands at the mouth of Vrbas to River Sava, and in smaller part in narrow valleys along the main stream and tributaries.

The Vrbas River Basin experiences seasonal floods in the spring (March - May) as a result of snow melt and in late autumn (December) due to heavier rainfall. This combined with groundwater flooding puts the VRB at risk from multiple sources and from combination of all three (groundwater, rainfall and snowmelt). The lower part of the Vrbas River Basin, meanders, and there is significant river bank erosion and deposition.

In the Vrbas River Basin (VRB), the climate change related impacts have already been observed. The effects have included increased frequency and severity of flooding in every year of the last decade. Records for the Vrbas basin for the last 10 years³ show that major floods occurred during late spring (April and May 2004) and summer (June 2010), but also during late autumn (December 2008) and early winter (January 2010), affecting all parts of the basin. The latest large flood event occurred in May 2014.

Estimated figures for damages sustained during the 2014 flood event have been collected. Based on the figures it is clear that the total damages of 131.7 Million BAM or \$88.5 Million USD far exceeds the damages sustained in floods for the entire period 2003 – 2013, making this the most devastating single flood event in BiH history. The impact included deaths, damage to infrastructure including more than 4 Million BAM or \$2.7 Million USD damages to roads and the destruction of 26 bridges. Over 5,400 houses were flooded (of which 216 were completely destroyed), 356 households evacuated, and more than 20,000 people affected. In Srbac and Banja Luka municipalities with more than 1400 businesses were affected. Throughout the basin, over 1,000 agricultural households (subsistence) were also affected and while exact agricultural damages are not available 5,355 ha of agricultural lands were flooded. In addition, the floods triggered more than 184 landslides.

The direct consequences of the flooding in the Vrbas basin are multiple and include: damages to the housing stock, damages of infrastructure and lower economic output, especially in agriculture. In the 2014 flood, commercial damages were also significant, due to the types of economic activities in the main affected municipalities. All of these negative consequences have direct negative effect on livelihood of the individual households and people of the VRB area. Considering the above, it is likely that repeated floods in VRB will increase vulnerability of the vulnerable groups and increase the risk of the rural population falling back to poverty.

3.3 Barriers targeted

Based on the identified problems and vulnerabilities in the basin, several barriers have been identified, including a lack of a comprehensive legislative and policy framework for strategic water and flood risk management, to respond to climate change risks; Fragmentation and gaps in policies and national regulations for long-term flood risk management under climate change and a lack of institutional capacities, technologies, equipment, data and tools for hazard, vulnerability, damages and loss assessments on which climate resilient flood risk management can be based. In addition, the lack of community level resilience technologies and adaptive

³ Data on flood damages collected from Vrbas River Basin Municipalities, UNDP 2013

strategies to minimize flood impact, including lack of a comprehensive and unified flood forecasting, early warning and response system to increase community resilience have been identified.

3.4 Project Description and Strategy

The 5 mill USD SCCF funded project aims to transfer adaptation technologies for climate resilient Flood Risk Management. This includes the development of state-of-the-art hydrological and hydrodynamic models for the VRB, which incorporate climate change predictions and produce flood hazard maps as the basis for spatial planning and long-term strategic FRM. A further area of technology transfer is the development of a GIS-based vulnerability loss and damages assessment tool, and importantly a systematized approach is embedded, to enable the ongoing collection, storage and analysis of socio-economic data. An important aspect of technology transfer is the upgrade and rehabilitation of the hydrometric network, and the harmonization and centralization of the hydrometric database. The project also develops the flood forecasting system and enhance the existing early warning system within the VRB which is underpinned by the centralized hydrometric database. Emergency response is being enhanced through the development of emergency response plans, and provision of training in flood-specific civil protection.

The project provides targeted training on climate-induced FRM to over 100 practitioners and decisions makers and develops an institutional capacity development plan for the long-term development of capability and capacity in FRM. The project works closely with affected communities to introduce climate resilient community-based non-structural measures and provides training to local communities in climate resilient FRM. This includes the introduction of agro-forestry, community-based early warning systems, reforestation and introduction of financial instruments such as flood insurance and credit deference schemes as a means of compensating for flood damages for agriculture. The project works directly with farmers to identify farm-level risks and vulnerabilities with respect to flooding and works to embed climate resilience measures to agricultural practices at the farm-level.

The enabling environment is being enhanced by embedding climate change into key sector policies, strategies and plans to enable climate resilient flood risk management within sectors that impact flood risk significantly. The sectors will include land use and spatial planning, forestry, agriculture and energy sectors. Specifically, the project introduces floodplain management regulations that will enhance zoning of development and activities away from high risk areas. It also introduces climate resilient building codes for construction in flood risk areas. The project further enhances land use policies related to activities that significantly impact on flood risk including aggregate mining of river beds and banks.

The project is a direct response to the priorities that have emerged from the Second National Communication. The project is designed to respond to the flood risks to the most vulnerable communities in the Vrbas river basin, in the areas that are most stricken by poverty and inhabited by many war returnees, displaced people and the rural poor that are among the most vulnerable social groups of the BiH. The project, by transferring best available technologies for climate resilient flood risk management, directly benefits 250,000 people within two administrative parts of BiH and contributes to further reconciliation in a war damaged area. Indirectly the project also benefits at least 464,000 people living in the VRB.

The project is improving the knowledge base on flood risk through fully developed modelling and flood mapping. This, as well as the efforts to increase institutional capacity, leads to improved strategic management of flood risk and improved flood forecasting and warning. In particular, the population of the VRB benefits from improved lead warning times to flood events due to implementation of the forecasting and improvement of the early warning systems. Implementation of spatial planning on the basis of flood zones will lead to reduced exposure of the target population in the VRB. Overall vulnerability of the population in VRB to flooding is reduced due to increased awareness and direct engagement of local communities in flood risk management. Adaptation of climate resilient agricultural practices by farmer communities increases their adaptive capacity and reduce exposure. Targeted training in FRM functions further increases adaptive capacities within municipalities.

Project Objective, Outcomes and Outputs/activities

Project Objective: To transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin		
Project Component	Expected Outcomes	Expected Outputs
1. Enabling environment for climate risk sensitive water and flood management	1. Key relevant development strategies/policies/legislation integrate climate change-resilient flood management approaches	1.1 At least two priority sectoral policies and plans (e.g. agriculture, hydropower, water resources) updated to include climate change modeling results; 1.2. Floodplain management and spatial planning regulations and policies updated to include climate change risks (revision of land use regulations, stricter policy on construction permits in the areas prone to flooding, etc.); 1.3. Appropriate adaptation technology solutions for climate resilient flood management in BiH codified and disseminated.
2. Technical and institutional capacity for transferring climate resilient flood management technologies and approaches	2. Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities	2.1. Improved hydrological and hydrodynamic model for the VRB incorporating climate change predictions, developed to produce flood hazard inundation maps for spatial planning and emergency response planning, and for the long-term strategic flood risk management of the VRB; 2.2. GIS-based vulnerability, loss and damages assessment tool and database established and institutionalized to record, analyze, predict and assess hydro-meteorological and other hazard events and associated losses; 2.3. Hydro-meteorological monitoring system in the VRB upgraded (increased from 11 to 25

		gauging stations) and harmonized into a central hydrometric system; 2.4. Institutional capacity strengthening plan developed and targeted training on climate-induced flood risk management provided to at least 100 practitioners and decision-makers;
3. Climate resilient flood management technologies for vulnerable communities in VRB	3. New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in VRB	3.1. Integrated land use and flood risk management plan for the VRB developed and non-structural measures implemented by local communities (through Output 3.2.), government and/or private sector; 3.2. Participatory community-based adaptation strategies, technologies and practices implemented in priority flood risk areas (e.g. community afforestation scheme on the flood plains; establishing locally controlled and managed flood zones; watershed rehabilitation works, etc.); 3.3. Local communities (particularly women and refugees) trained to implement and maintain flood resilient non-structural intervention measures, including agricultural practices such as agro-forestry, to improve livelihoods of 13 communities in the VRB, and community-based flood early warning systems; 3.4. Early warning system in VRB modified to include the new hydrometric monitoring network as part of a fully-integrated flood forecasting system (comprised of centrally-based and community-based early warning systems). Municipal-level flood response and preparedness plans prepared and implemented.

3.5 Project Implementation Arrangements

The Government of Bosnia and Herzegovina has recognized a need to address flood risks and consequences, as well as associated impacts on populations and key socio-economic sectors in vulnerable areas in Vrbas River Basin. Entity line ministries also fully support the project. Although the existing water development framework does not consider the long-term implications of climate change, it provides favorable baseline conditions for the project to advance policies and implement a suit of on-the-ground measures for addressing adaptation needs in flood management. The project is set up to allow for later upscaling and replication. The currently implemented methodologies are in line with EU directives, and of a quality level that will allow them to become national methodologies, applicable in similar settings

elsewhere in the country. Expertise and experience gained both by line ministries as well as by implementing bodies will be useful for identifying needs and cases where methodologies can be successfully implemented with the desired benefits. Further details are provided in the recommendations section.

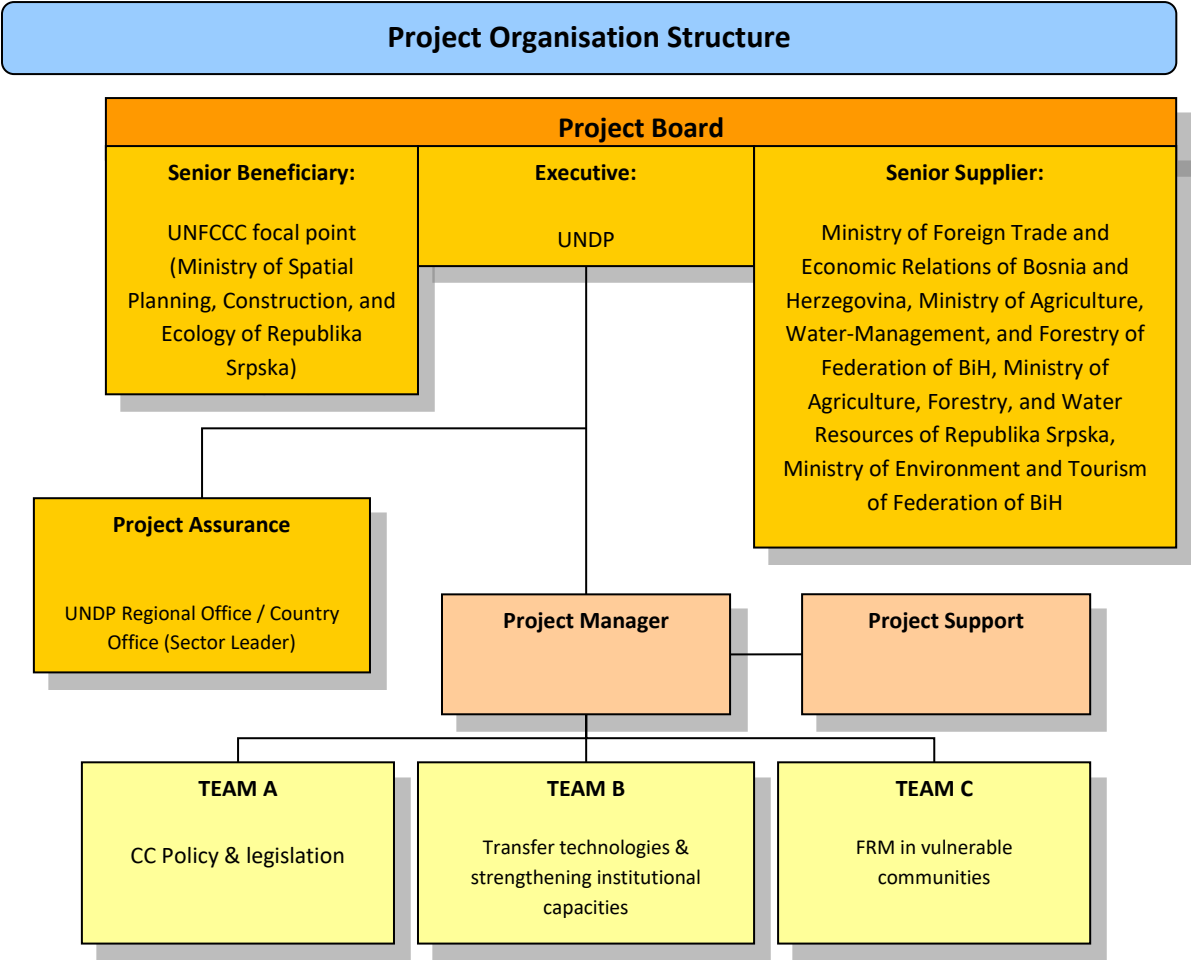
Given the complexity of BiH's federal administrative set-up, that includes two self-governing entities and applies multi-layered administrative procedures, the recently approved one United Nations Programme / United Nations Development Assistance Framework (UNDAF) for 2015 – 2019 and UNDP's Country Programme Document (CPD) for 2015 – 2019 for Bosnia and Herzegovina stipulate that all GEF and other vertical funds' financed projects be implemented under the direct implementation modality (DIM). Furthermore, this modality has been supported and agreed by governments at all levels (state and entity) and is in line with the Standard Basic Assistance Agreement (SBAA, 1995) between the UNDP and the Government of BiH. Guided by these above-mentioned country programme frameworks, the DIM is applied in a way to take into account potentials for maximum cost-effectiveness and tailored capacity development of counterpart government institutions. The approach has proven to be successful with all counterparts interviewed during the MTR confirming their close coordination and appreciation of the project.

Bosnia and Herzegovina UNFCCC Focal Point, Ministry of Spatial Planning, Construction and Ecology of Republic of Srpska and Ministry of Foreign Trade and Economic Relations (MoFTER) are the government institutions which are engaged in the implementation of the project and act as the Responsible Parties engaged by UNDP. UNDP is the Executing Entity/Implementing Partner for the project and is accountable to the GEF for the use of the funds. The UNDP Programme officer takes the oversight and quality assurance role for UNDP while a Project Manager contracted for the project has the project execution/implementation role and thus separating project oversight and execution/implementation duties. Project implementation by the ministries engaged as Responsible Parties ensure the timely and verifiable attainment of the project objective and outcomes. The UNFCCC Focal point and MoFTER provides support to, and inputs for, the implementation of all project activities.

A Project Board was established at the inception of the project to monitor project progress, to guide project implementation and to support the project in achieving its listed outputs and outcomes. It is co-chaired by UNDP and BiH UNFCCC focal point. Project implementing entities (Ministry of Spatial Planning, Construction, and Ecology of Republika Srpska, Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina), as the key governmental institutions in charge of spatial planning, natural resources management, environmental protection and climate change policies, ensure that other governmental agencies are duly consulted and involved as per their mandate. Ministry of Agriculture, Water-Management, and Forestry of Federation of BiH, Ministry of Agriculture, Forestry, and Water Resources of Republika Srpska, Ministry of Environment and Tourism of Federation of BiH are also active members of the Project Board.

Other participants are invited into the Board meetings at the decision of the Board. The Board meets regularly (twice a year) to review project progress, discuss and agree on project work plans. One of the key tasks of the Board is to ensure coordination and synchronization of central and local-level activities supported by the project. In this respect, the Board serves as

a platform for key project stakeholders and beneficiaries to regularly get together and design a joint strategy of work on the project.



The day-to-day management of the project is carried out by a Project Manager under the overall guidance of the Project Board. The core Project Team consists of a Project Manager and Administrative Assistant, supported by Senior/Chief Technical Advisor and Project Officer who divides their responsibilities among specified three main areas of work. For successfully doing this, public outreach, establishment of the contacts and co-operation with the key local and international stakeholders and expert institutions as well as ability for adaptive management and new innovative approaches are of utmost importance. The Project Manager reports to UNDP and the Project Board. The project personnel are selected on a competitive basis in accordance with the relevant UNDP rules and procedures and in consultation with the UNDP-GEF Regional Technical Adviser.

3.6 Project timing and milestones

The “Technology transfer for climate resilient flood management in Vrbas River Basin” is a five-year project that started in April 2015 and is scheduled to run to April 2020.

Key project milestones include the inception workshop, the mid-term review, the terminal evaluation and the project closure. The inception workshop has been held on time in April 2015 (planned May 2015), the midterm review has started as scheduled in November 2017

and there are no foreseen changes to the project closing date and/or the terminal evaluation and project closure.

3.7 Main stakeholders

Main project stakeholders on state and entity level, include ministries responsible for water management, water agencies, hydro meteorological institutes, climate change focal point in BiH (Ministry of Spatial Planning, Construction, and Ecology of Republika Srpska) and other environment related ministries, as well as civil protection. On entity and cantonal level, political, operational and executive jurisdictions for water sector rest with line Ministries in charge of water. The stakeholders were extensively consulted in the project preparation process and contributed data and practical guidance. One of the important roles of the stakeholders in this project is to ensure that its activities are fully aligned with the relevant strategic and operational documents of the domestic government structures; as well as to ensure alignment of the project's activities with all the other ongoing projects and initiatives, the most important being the Emergency Flood Relief and Prevention Project (EIB Loan) for which the Entity Ministries are directly responsible as the PIU's for implementation of the EIB loan.

On local level, the project has mapped all stakeholders in the project area and created a reference group in each municipality. Civil protection organizations and representatives from municipal government actively participated in the project preparation. Additionally, civil society organisations that could be interested in project results are involved and encouraged to take active participation. The project is further making a specific attempt to involve the private sector in the VRB. For example, micro agricultural businesses in VRB are involved due to the fact that they are among most affected by floods groups.

The list of stakeholders consulted during the MTR mission (mission itinerary) is provided in Annex 6.5 and the list of stakeholders interviewed in Annex 6.6.

4 Findings

4.1 Project Strategy

The project is well designed and accepted as well as endorsed by the key partners who recognize its importance. The combination of technical work, new technologies and instruments, with practical on-the-ground implementation is greatly appreciated by all stakeholders. The project strategy follows the BiH and entities governments needs highlighted by the impacts of the 2014 floods, considering both soft as well as the most important hard measures and targeting several aspects of flood prevention, preparedness and mitigation. An aspect that has come up from the stakeholder consultation is that concepts of "living with floods" or "making room for water" aiming at mitigation rather than protection are not well understood by the beneficiaries and that instead hard protection or alleviation measures are desired without consideration of potential downstream consequences. Hard measures that are currently implemented and that have been visited during field visits are designed in a way to ensure faster drainage but not to provide maximum protection. While downstream impacts have likely not been considered in the design it is anyhow evident from the limited protection design that during larger flood events overtopping will occur, leading to flooding of lower value pasture areas - an effect that is actually beneficial for providing flood storage considering holistic flood management concepts. Even if not initially planned for the situation could be used as a good practice example and model for future upscaling. Soft measures as well as physical improvements of warnings are well covered.

Stakeholders and beneficiaries of the project on all levels are well involved with full ownership, as evident during all stakeholder meetings. The satisfaction with the project strategy was particularly highlighted by all stakeholders, also expressing satisfaction that the project was designed in a participatory manner from the start and respectively reflecting government needs on BiH government and entity as well as municipality levels. The project leadership and technical staff are further well involved with stakeholders and beneficiaries during project implementation, both considering steering committee meetings and involvement on technical level, guaranteeing that approaches are adjusted and finetuned during implementation. Especially on municipality level (i.e. grassroot level) satisfaction was shown in this regard and benefits are seen. It can therefore be expected that planned project outputs will be met.

Decision-making during project implementation has been reported as being based on steering committee discussions as well as needs and practicalities in the respective institutions as voiced by respective staff. Stakeholders and beneficiaries expressed satisfaction regarding these decision-making processes and showed respective ownership.

A results framework has been developed for the project that has been successfully being used in the 2016 and 2017 project implementation review. The indicators are considered SMART (Specific, Measurable, Attainable, Relevant, Time-bound) though with only single indicators at project end being defined. These indicators including their baseline level are clearly described and are based on the stakeholder agreed project objectives and related to outcomes/outputs that can be considered practical and feasible based on stakeholder feedback collected during the MTR meetings. Targets set for the end of the project are achievable except the target under outcome 3: At least 4,200 hectares of agricultural land protected by non-structural measures (e, g. floodplain agro-forestry to be implemented on at least 840 hectares). Due to

high costs of agro-forestry measures it will not be possible to implement these measures at 840 hectares. This issue is duly explained in the report. Project progress as per results framework is shown in Section 4.2.

Risk and assumptions, which were revised during project inception period, have been reviewed and it was suggested to increase prioritization of the risk: *Underestimation of project scope and requirements*, due to issues of flood risk management planning, flood insurance scheme and costs of agro-forestry measures. These issues are further explained in the document and recommendations provided.

Risk Description/Risk Source	Consequence	Risk Prioritisation	Mitigation/Action Description
Key roles within the project not filled. Lack of expertise for key role.	Impact on project quality and possible programme/cost impacts.	M	Ensure a good fit between the objectives of a role and the experience of the person allocated to that role.
Underestimation of project scope and requirements	Additional time and cost for undertake the project	H	Allow sufficient time for good project planning and risk management
Poor communications between international experts and local experts	Misunderstandings/difficulty in collaborating on technical work. Difficulty in quality assurance due to language/understanding barriers	M	Since the project deliverables will be delivered in English, need to ensure sufficient translators with appropriate technical background to enable effective communications. While the project reporting will be in English, it is imperative that the outputs are also translated back into technically correct local language to ensure that key messages and ideas are not 'Lost in Translation'
Poor user requirements specified, poorly defined data standards leading to poor design and implementation of data management system	Poor data management leading to errors in technical assessment and errors in design.	M	Scope project data management requirements early on. Establish facilities (i.e. technologies) that enable effective data sharing between organization/individuals holder and/or accessing data. Identify 'data champions' within organisations involved in project implementation of supply of data

Failure to identify key data sets. Delays in collecting essential data for the project. Risk of essential data not being available or to the quality or accuracy needed	Lack of data leading to poor technical assessment and design. If essential data sets not available (or of poor quality) may need to undertake data modelling (e.g. data infilling), or collect data as part of the project	H	Undertake detailed data requirements and data identification (identifying all sources) as the first priority on the project. Link to data management definition task to ensure early centralized access of all relevant data. Undertake data analysis to identify quality, gaps, requirement for data modelling and additional data collection early on
Cost of modelling software more than budgeted for. Cost of floodplain DEM greater than original estimate. Floodplain data too coarse for detailed modelling	Higher expenditure on software and DEM data. If poor resolution DEM data used, could result in poor modelling results and poor design of intervention measures	M	Obtain detailed software quotes and ensure it fits within budget. Review freeware but justify using freeware from a technical perspective. During inception phase undertake a 'user requirements gathering' exercise to include a review of existing and proposed software needs and draw from lessons learned from projects such as Southeastern Europe and Caucasus Catastrophe Risk Insurance Facility, with regards to software cost. Before purchasing DEM obtain sample data for different parts of the VRB basin and check accuracy. Undertake ground truthing to confirm data accuracy
Cost of survey equipment higher than estimated	Higher expenditure	M	Investigate alternatives to purchasing surveying equipment under this project. For example, examine the cost effectiveness of hiring a survey contractor who will already have the equipment rather than purchasing
Scope and cost of survey underestimated	Insufficient survey data for technical studies. Higher expenditure to get the surveys required	M	Early scoping and recosting of surveys to be undertaken

Delays in availability of historical data, survey data leading to delays in starting the technical studies and modelling. Insufficient data and/or data of poor quality available to undertake sufficiently detailed and accurate modelling to support feasibility and desing studies; Model not suitably detailed and accurate to undertake feasibility studies	Delay to overall programme, poor outputs from technical assessments leading to poor intervention designs	H	Enforce data collection and survey programme rigorously. Identify data quality issues early as well as issues with model and technical studies quality before using in intervention designs. Enforce a 'check, review, authorize' procedure to capture quality issues related to human errors
Failure to consult all relevant stakeholders	Leading to lack of buy-in and failure to agree policy and legislative changes	L	Undertake institutional mapping to identify all relevant stakeholders in government, non-government, community donor and other user groups. Early establishment of inter-agency working group and engagement with key stakeholders. Ensure continued engagement of stakeholders throughout the process
Failure to reach agreement on new policy frameworks	Limited (or no) changes to legislation to address current issues will lead to continued exposure to hydrometeorological hazards	H	Ensure that the Inter-agency Working Group includes the right composition of stakeholders and is all inclusive to maximise the chance of reaching agreement on new policy framework. Ensure that the Project Board is also inclusive of all key stakeholders.
Failure to fully identify training needs	Continued lack of capacity within BiH for hydrometeorological hazard assessment and management. Leading to continued vulnerability	L	Initial and continued assessment of capacity and establishment of training programme that will ensure continued development of

			capability and adequate succession planning
Review of requirements and development of a detailed functional specification could result in larger scope for FFEWS than currently budgeted for	Greater cost of establishing FFEWS than previously estimated. Equipment cost increase	M	Review should justify any major changes to the scope and equipment requirement
Unforeseen delays in undertaking essential surveys due to weather/access issues etc.	Delay to overall programme	H	Surveys to be scheduled to maximise favorable weather conditions. Early reconnaissance visits to remote areas will determine potential access difficulties. Issues/Risks will be raised to the PEB and adequate mitigation measures will be discussed/approved by PEB and implemented.
Adverse climatic conditions may also pose risks to workforce health and safety, or damage adaptation measures being implemented		H	The project will draw up an engineering and safety plan to reduce immediate risks of hazard occurrence during works. Health and safety precautions for the workforce will be established in the inception phase, drawing on lessons from other high-altitude projects. Contingency and evacuation plans will be prepared. All sub-contracted firms will need to have H&S insurance for its employees.
Resistance of certain government institutions to introduce floodplain development policy that sets number of land use limiting regulations and floodplain zoning rules.		M	Bottom-up approach to the policy development with active engagement of local population and authorities will enable the project to follow the principles of subsidiarity and participation underlined in the Regional Development Strategy and help local authorities make decentralized climate compatible development decisions. Engagement of the Regional Development Ministry

			will help the flood plain policy to emerge in full consistency with the development priorities that will be supported to embark on climate resilient pathway.
Lack of incentives for particular local communities to cooperate in activities that do not yield immediate financial value, but aim at longer-term resilience, may reduce stakeholder engagement and comprehensive participation.		M	The project incorporates activities that yield immediate benefits for communities in terms of awareness, preparedness, skill development and income generation (agro-forestry schemes). This will be emphasized during all meetings and consultations with community representatives during the inception phase
Due to staff turnover at the target Ministries the trained staff may leave for the other job opportunities undermining installed technical capacity		L	Special training conditions and / or training for trainers will be arranged to keep the trained staff at the target Ministries. Staff retention and succession plans will be developed
Delays in recruitment of qualified project staff may affect the timeframe of different project activities.		L	A pro-active coordination mechanism will be established by UNDP during the project inception phase. TORs for project staff have already been prepared
Changes in the government structures and functions		L	Closely monitor situation and keep regularly updated on any developments in this regard; call immediately PEB meeting.

The project is not specifically targeting women as direct beneficiaries, special attention was paid to gender through socio-economic research and capacity building.

Based on stakeholder discussions project implementation is reported as excellent, providing positive effects for beneficiaries as per the intended project outcomes. The project is further seen as a good practice example for upscaling efforts in other basins in the country.

Overall, project strategy is rated as: Satisfactory

4.2 Progress Towards Results

Project progress as per the results framework is shown in the following overview table. At the time of MTR, all indicators are on target to be achieved or are reachable applying adaptive management with several potential issues identified for implementation of future activities. No obvious barriers exist assuming a continued excellent cooperation between project management and stakeholders as well as beneficiaries. Relevant and necessary adjustments to the project outputs / outcomes as e.g. to the delay in development of the flood risk management plan, insurance approach and implementation of agro-forestry measures are considered practical necessities that require adaptation and not barriers.

Progress towards outcomes and outputs:

Outcome 1: Key relevant development strategies/policies/legislations integrate climate change resilient flood management approaches

Output 1.1. At least two priority sectoral policies and plans (e.g. agriculture, hydropower, water resources) updated to include climate change modeling results

The project has taken a detailed review of the existing legislative and institutional framework and has come up with a recommendation for entry points for climate changes and flood risk management into local regulatory and policy framework. Climate change models for Vrbas River Basin have been developed via regionalization of the results of global climate models. Results of regionalization of three climate scenarios (A1B, A2 and RCP8.5) for the territory of Bosnia and Herzegovina have been used as a base for detailed studies on climate change impact on the most vulnerable sectors. These findings with identified priority adaptation measures will be compiled in the National Adaptation Plan. Amendments to the Water Law which would consider the EU flood directive and include climate change have been made and adopted by the Governments and National Assembly.

The project has established an inter-agency working group that meets regularly, at least quarterly, depending on the subjects discussed. The project work focuses on tackling main deficiencies identified by institutional analysis such as: the lack of a clear division of works between institutions, a systematic approach to data gathering and lack of coordination among various institutions. In order to show, in practice, the lack of clear division among institutions the project organized an interactive workshop which included simulations of a flood event and provoked a reaction of the relevant institution: hydro-meteorological institutes, water agencies, civil protection, and ministries in charge. The main obstacles identified are: overlap of activities between hydro-meteorological institutes and water agencies, lack of specific, targeted and detailed information to be issues and received, and poor response from civil

protection units. An urgent need to include power companies i.e. hydropower schemes into flood forecasting and early warning systems has been identified.

An analysis of the current situation of the insurance sector in BiH, including an overview of current practices related to risk management techniques as well as risk financing modalities has been completed. An overview of the institutional and legal environment for the insurance market in BiH, along with a review of the insurance and risk financing mechanisms of countries at a similar stage of development as BiH has been developed, showing the almost non-existence of insurance against floods. Index types of insurances are not known to the local regulatory framework i.e. currently damages are only covered if it can be proven that the damage actually occurred, not based on hydro-meteorological triggers, as necessary for index-based insurances.

Output 1.2. Floodplain management and spatial planning regulations and policies updated to include climate change risks (revision of land use regulations, stricter policy on construction permits in the areas prone to flooding, etc.);

Activities for the development of spatial planning policies for floodplains in the Vrbas River Basin have started by completing an analysis of the legal framework related to spatial planning and its link with flood risk management. It is important to note that existing spatial planning documentation do not take into consideration existing flood risk. Amendments to the law on use of space have been made and its approval by the Government is pending.

Output 1.3. Appropriate adaptation technology solutions for climate resilient flood management in BiH codified and disseminated.

The project communications have been result-oriented and attractive. One specific example of the project human-centered communication is a set of photo essays:

<https://undp-adaptation.exposure.co/datadriven-climate-resilient-flood-management>

<https://undp-adaptation.exposure.co/forests-fires-floods>

<https://www.preventionweb.net/news/view/50800>

The project is currently producing a short documentary which will focus on impact of the implemented flood risk management measures and their importance for vulnerable population.

Development of guidance documents is in line with activities performed. So far, a flood risk modelling and mapping methodology has been developed and adopted by local institutions. Guidance for the development of a centralized flood forecasting and early warning system has been established. A draft operation and maintenance plan for hydrometric stations has been completed. Guidance to use PGIs and geoportal has been developed.

Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities

Output 2.1. Improved hydrological and hydrodynamic model for the Vrbas River Basin incorporating climate change predictions, developed to produce flood hazard inundation

maps for spatial planning and emergency response planning, and for the long-term strategic flood risk management of the Vrbas River Basin.

The project has put significant effort into overcoming problems resulting from a lack of data and data quality. After digitization of the available data, several independent experts, together with representatives of the hydro-meteorological institutes conducted quality checks and interpolated missing data, bringing data quality to a level satisfactory for further hydrological and hydraulic modeling. Hydrological modelling included climate change scenarios developed for the Vrbas River Basin in line with IPCC scenarios as well as 2D hydraulic modelling of the whole basin. The models, representing a significant technological step-up in BiH, created a base for development of flood hazard and risk maps for 20-, 100- and 500-year return periods, developed in line with the EU Flood Directive. The developed maps have been handed over to water agencies for further review and usage, but also to local municipalities which took a leading role in ground-truthing of the maps in the field. Based on feedback the maps were rated as approximately 95% accurate. Representatives of hydro-meteorological institutes and water agencies were directly involved and trained in hydrological and hydraulic modelling respectively.

Further, based on flood risk maps, flood zones for the Vrbas River Basin will be developed. These maps will also create a base for a flood insurance model, as well as for selection of non-structural measures that will be implemented within the project.

Taking into consideration the fact that flash floods create the largest damage in the basin, the project-initiated activities to identify torrent risks. Developing susceptibility models for torrents is in progress. The susceptibility models will include erosion maps for the Vrbas River Basin, a torrents register and cadaster, as well as a GIS base for the model.

Output 2.2. GIS-based vulnerability, loss and damages assessment tool and database established and institutionalized to record, analyze, predict and assess hydro-meteorological and other hazard events and associated losses;

A spatial data infrastructure has been developed for the project and can be accessed via a Geoportal at <http://vrb.pmfbf.org/>. It serves to store, maintain and manage all information pertaining to the project to provide access to data to the technical specialists and the decision makers. Flood hazard and risk maps have been included as well. This geoportal will be further populated with all findings and results of the project until final handover to the relevant institutions.

Flood loss and damage modelling has been finalized and GIS representation of loss-damage curves is in progress. Lack of unified data about damages, depth and duration of historical floods at specific locations has been overcome by collecting data from municipalities and creating a database. Additional analysis for vulnerability of females to floods has been completed and another module of flood loss and damage modelling will be set up to take these data into consideration.

Output 2.3. Hydro-meteorological monitoring system in the VRB upgraded and harmonized into a central hydrometric system;

After undertaking an assessment of the monitoring network requirements for effective monitoring for flood risk management, flood forecasting and early warning system operation, technical and financial assistance for the establishment of the hydro-meteorological network in Vrbas River Basin has been provided. This network consists of 28 gauges (20 precipitation, 2 meteorological and 7 hydrological automatic gauges). Centralized hydro-metric databases, with an automatic transfer of hydro-metric parameters, have been established within hydro-meteorological institutes. The importance of this activity is significant as there is no single automatic hydrological gauge downstream in the Vrbas River Basin, where flood risk is the highest. The Vrbas River Basin is the first basin in BiH with a centralized hydro-meteorological monitoring network with sufficient coverage. The integration and redesign of an existing, obsolete Water Information System has been completed. The system will enable the exchange of information among all three water agencies in Bosnia and Herzegovina, as well as provide access for the ministries of water management to the available information, testing of the system is currently in progress. It is important to mention that for the first time in BiH three water agencies agreed to exchange data within this restructured Water Information System. It is important to say that three commissions have been formed on BiH level since 2000, trying to establish mechanism for data exchange within water sector and all of them failed, while mechanism and methodology developed under this Project has been accepted by all three agencies and relevant ministries.

Output 2.4. Institutional capacity strengthening plan developed and targeted training on climate-induced flood risk management provided to at least 100 practitioners and decision-makers;

The current situation and future needs as well as requirements of sector institutions in relation to flood risk reduction capacities have been analyzed. The analysis has shown that the approach to flood is mostly retro-active and post-disaster oriented. There is no systematic approach towards risk reduction. On-the-job training has been provided for practitioners in the following areas: hydro-meteorological network operations and maintenance, use of Hydras software, hydrological and hydraulic modelling, flood mapping, water information system data management and use, as well as the use of early warning system equipment.

Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in VRB

Output 3.1. Integrated land use and flood risk management plan for the VRB developed and non-structural measures implemented by local communities (through Output 3.2.), government and/or private sector

Farm level exposure and flood risk assessment has been done for the whole Vrbas River Basin and the results included into flood risk maps. An agro-forestation scheme for the Vrbas River Basin has been developed. It contains concrete proposals and will serve as a base for selection of agro-forestry measures. However, the project found out that the implementation price of agro-forestry measures is far above project budget e.g. the price of reforestation per hectare is approximately USD 3,000. Due to these high prices, implementation of agroforestry measures as defined in the project document has not started as yet. As implementation requires sufficient lead time, and the project has already covered half of its lifetime, project management is advised to pick up the respective works in due course.

The project conducted an analysis of a current situation regarding flood and natural disaster insurance in BiH, as well as a comparative analysis with other countries. Two round tables, where potential models for index-based and indemnity-based insurance schemes were presented to local stakeholders, were organized. Although this activity was very much supported by all involved stakeholders: relevant ministries, insurance agencies, private sectors (insurance companies), the main conclusions of these round tables also pointed out the main deficiencies regarding insurance sectors in BiH: low insurance take-up as citizens see the state/entity/municipality (i.e. public budget) as a body responsible to cover flood/natural disaster damages; insurance is hardly seen as flood risk management measure; insurance companies are not very motivated to sell premiums for this type of insurance as they cannot reach “profitable” number of customers; there are no historical data on previous flood damage such as flood depths recorded at objects, financial damage etc. It is very important to say that the Council of Ministers, with project support, recently initiated the establishment of a working group that should work on development of an insurance model for all-natural disasters.

The planned flood insurance scheme is particularly difficult in its design. Insurances generally live of the contribution of a large pool of subscribers that are equally at risk of a random hazard that hits selectively. So, in this way the large number of subscribers can cover the risk with relatively low premiums. In contrast, the hazard of flood is typically confined to specific areas that, if a flood hits, are prone to widespread damage and respectively broad scale insurance claims. Further it can be expected that only people with flood prone properties would sign up for a flood insurance. As a result, it is an unacceptable risk for the insurance who will not be able to spread the risk to a wide enough population and respectively offer an affordable premium. This situation can be mitigated by either broad spatial coverage overarching different river basins to spread the risks, or even better reinsurance schemes or substituted schemes as e.g. the National Flood Insurance Program in the United States. The scheme would in any case need to be designed to fit with the general setup of the national insurance industry, governmental-, as well as legal requirements in BiH.

As a similar case, the projected flood risk management planning has not yet been conducted as an unclear regulatory framework and non-existence of necessary laws is hindering implementation. The project is actively supporting institutional capacity development with the aim to improve the necessary regulatory and legal situation as a base for flood risk management planning.

In order to assure a participatory approach involving the local stakeholders, local municipalities were asked to identify non-structural flood risk management measures in their municipalities using a public call. Based on a primarily class of risk and cost-efficiency, ten projects were selected for implementing non-structural measures that will be financed through the project. An active role in project selection was given to water agencies, that are in charge for river basin management, to ensure an integral approach.

Output 3.2. Participatory community-based adaptation strategies, technologies and practices implemented in priority flood risk areas (e.g. community afforestation scheme on the flood plains; establishing locally controlled and managed flood zones; watershed rehabilitation works, etc.);

An extensive socio-economic survey has been undertaken to assess and quantify the value of property at the level of settlements by municipalities. Collected spatial socio-economic data were integrated into flood hazard maps in order to produce vulnerability maps with estimates of damages and casualties. The project has developed a methodology for gender disaggregated data collection within a flood risk assessment. A study regarding vulnerability of females to floods in Vrbas River Basin has been completed and another module of flood loss and damage modelling will be set up to take these data into consideration. Analysis shows that, out of total number of females, a large percentage is exposed to flood risk, at home and the work place/school (71%). Within upcoming project activities that will focus on local communities, special attention will be paid to capacity building of females in order to address flood risk challenges. Municipality-level flood response and preparedness plans will be fully engendered.

A Community engagement, mobilization and sensitization strategy has been developed. It sets out the general community engagement steps for each of the stages of community involvement throughout the project. Participatory GIS, as a means of integrating local community information into the assessments of flood risk has been developed and added to the geoportal. Its introduction to local municipalities started in September 2017.

3.3. Local communities (particularly women and refugees) trained to implement and maintain flood resilient non-structural intervention measures, including agricultural practices such as agro-forestry, to improve livelihoods of 13 communities in the VRB, and community-based flood early warning systems;

Training for communities on roles and responsibilities during flood emergency and for the first and second responders is in progress.

3.4. Early warning system in VRB modified to include the new hydrometric monitoring network as part of a fully-integrated flood forecasting system (comprised of centrally-based and community-based early warning systems). Municipal-level flood response and preparedness plans prepared and implemented.

Based on the developed ToR for the Flood Forecasting and Early Warning System as well as existing hydro-meteorological monitoring data, geographical and demographic characteristics, the project, together with Civil Protection representatives have identified, purchased and installed early warning system equipment in municipalities in the Vrbas River Basin. The equipment consisting of 8 sirens, 140 hand radio stations, 28 mobile radio stations, 14 fixed- and vehicle stations. The equipment has been distributed to 14 municipalities in Vrbas River Basin and entity and cantonal civil protection units.

Confirmation of the institutional set-up for the flood forecasting and early warning system has been obtained despite the fact that institutional fragmentation remains the main obstacle to meaningful cooperation and consolidation of main stakeholders around the project aims in the water sector. This issue is to be overcome by creation of the first FFEWS platform in BiH, that will be placed in water agencies and by clear definition of roles of all relevant institutions in FFEWS. Hydrological and hydraulic models for flood forecasting have been developed and may require minor adjustment depending on selected FFEWS platform.

The project is spending significant efforts for aligning its activities with other projects in the area of flood risk management in BiH. The WBIF project "Flood Hazard and Flood Risk Maps Development" took off in April 2017 (almost 2.5 years after initially planned) and, as requested by the Project Board, the project provided all available documentation (LiDAR survey, maps developed for Vrbas River Basin) to them. Also, developed models have been forwarded to the International Sava River Basin Commission for their hydrological modelling efforts, etc. Further coordination of activities on development of Flood Risk Management Plans (FRMP) is required due to the fact that the adoption of FRMP is not clearly defined in the local legislation in BiH and the European Commission has, via IPA 2016, provided funds for development of flood risk management plans for the whole country. The starting date of this undertaking is not known as yet, as the development of the plans depends on completion of the flood hazard and risk maps. It is estimated that development of the FRMPs for the rest of the country will not start before 2020. These factors pose a critical risk to further activities related to flood risk management plan development. The project will continue working with its partners in order to agree on basins for which FRMPs can be developed and will further pursue development of a FRMP for the Vrbas River Basin, to function as a pilot for the rest of the country, regardless of the starting time of the IPA 2016 project.

Observations during the MTR mission as well as based on the review of documents and feedback from stakeholders show that the technical output that the project produces are excellent and practical considering the project context as well as stakeholder and beneficiary capacity and needs. The results respectively serve the actual needs of the population affected by flooding as well as improving the capacity and the ability of the involved stakeholders to act. Shortcomings have been explained in previous sections, particularly considering the development of a flood insurance scheme and implementation of the agro-forestry measures. For the remainder of the project it will further be necessary to focus on implementing flood risk management planning and to install the required technical, managerial and institutional prerequisites with the stakeholder institutions to sustainably carry on with flood risk management activities after project end.

Overall, progress towards results is rated as: Highly Satisfactory (HS)

Justification for project rating for each outcome has been given in the section below, explaining progress towards outcomes and outputs.

Matrix of Assessing Progress Towards results

Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved
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Project Strategy:	Description of Indicator	Baseline Level	Target level at end of project	Progress at MTR
Project objective: To transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin	<p>Number of new technologies transferred to BiH as part of a methodology for strategic FRM</p> <p>AMAT indicator 3.1.1.1</p> <p>Type of adaptation technologies transferred to the target groups.</p>	Limited institutional capacity and technologies in use for strategic FRM in BiH	At least 5 new technologies introduced (hydrological and hydrodynamic modelling, state-of-the-art monitoring equipment, flood forecasting and early warning systems, flood damages and losses modelling and vulnerability assessment, and a number of non-structural flood management technologies to BiH)	<p>Implementation of new technologies is continuing according to project workplan</p> <ol style="list-style-type: none"> 1. Hydro-meteorological network consisting of 7 hydrological, 2 meteorological and 20 rain gauges is operational. 2. Climate change model for Vrbas River Basin has been developed. 3. Hydrological and hydrodynamics models (including 2D model for the whole basin) have been completed. Hydrological modelling included climate change scenarios. 4. Hydrological and hydraulic models for flood forecasting have been completed. Setting up of flood forecasting and early warning system will be finalized next year. 5. Vulnerability assessment, including gender segregated data, has been completed. Flood depth-damages curve has been developed. 6. Flood hazard and risk maps have been developed. 7. Torrents register and torrential flood susceptibility model developed. 8. Non-structural measures have been partly implemented (physical interventions and warning system are in progress) while others face challenges (insurance scheme) based on the particularities in BiH. Project management is aware of the problems and working on solutions.

	VRB (12% of BiH territory) covered by an automated hydrometric monitoring network for effective flood forecasting and early warning	Hydrometric stations currently cover 50% of the area required for FFEWS for VRB	The VRB (i.e.12% of BiH) covered by a Hydrometric network that provides the optimal coverage required for FFEWS	Automated hydrometric monitoring network has been established in Vrbas River Basin, which makes it the first river basin in Bosnia and Herzegovina with a sufficient hydro-meteorological network coverage. Data collection and processing has been centralized and is taking place in hydro-meteorological institutes.
Outcome 1: Key relevant development strategies/policies/legislations integrate climate change resilient flood management approaches	AMAT Indicator 3.2.1 Policy environment and regulatory framework for adaptation related technology transfer established or strengthened	1: No policy/regulatory framework for adaptation related technology transfer in place	4: Policy/regulatory framework for adaptation related technology transfer have been formally adopted by the Government but have no enforcement mechanisms	<p>The project has reviewed existing legislation, policies strategies and plans and identified all sectors of relevance to flood risk. Entry points in the main legislations (law on waters, water management strategies, law on agricultural land, law on spatial planning) for introducing Climate Change considerations have been identified. Amendments to the Water Law, transposing EU flood directive have been approved by the Government and is awaiting national assembly adoption. Preparation of by-laws identifying clear institutional roles in hydro-meteorological data flow, flood forecasting and early warning system is in progress. Development of flood zoning policy has been initiated.</p> <p>Challenges have been identified with gaps in required regulations and legislation for flood risk management plans and insurance schemes. The project will continue working with the partners in order to clarify basin levels for which FRMP can be developed and will further pursue development of FRMP for Vrbas River Basin, as a pilot for the rest of the country. Also, a flood insurance scheme model applicable for Bosnia and Herzegovina will be developed.</p>

	No, of Adaptation technology solutions for climate resilient flood management (CRFRM) enabled for implementation	0: Document codifying standard methodologies and procedures for climate resilient flood risk management (CRFRM)	At least 10 guidance documents produced on climate resilient flood risk management topics	Flood risk modelling and mapping methodology has been developed and adopted by local institutions. Guidance for the development of a centralized flood forecasting and early warning system has been drafted. Draft operational and maintenance plan for hydrometric stations has been completed. Guidance to use PGIs and geoportal has been developed. Ongoing progress of activity to be monitored
Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities	AMAT Indicator 3.2.2: Strengthened capacity to transfer appropriate adaptation technologies	1: Very few professionals are aware of adaptation technologies	3: High capacity achieved (>75%). Provision of models, information systems, tools and training in the use of these to professionals, on various aspects of climate adaptation technologies	Professionals in hydro-meteorological institutes and water agencies have received trainings on hydrometric monitoring. Hydro-meteorological institutes and water agencies professional have been included in and have received on-work training in hydrological and hydraulic modelling. Geodetic experts have been involved and trained in interpretation of LiDAR survey. Professionals from water agencies and relevant ministries have been receiving continuous training in water information system (data entry, analysis etc.). Members of civil protection units have been trained on how to use early warning system equipment. Ongoing activity that will require significant efforts throughout the implementation period
	No, of institutions enabled to modify risk management strategies based on introduced vulnerability, loss and damages	Most of the socio-economic information required to assess flood damages, losses, exposure and vulnerability is	GIS-based flood damages, losses and vulnerability assessment tool developed for VRB and systematic socio-economic survey	Project spatial data infrastructure, in line with the EU INSPIRE directive has been developed. Development of GIS-based flood damages, losses and vulnerability assessment in progress. Available data have been collected and digitized. Lidar geodetic survey of flood risk areas, as identified in preliminary flood risk assessment, have been completed. Completed flood hazard and risk maps have been entered in the project geoportal. Socio-

	assessment and improved hydrometric monitoring technologies	not currently available and is not collected systematically and gender-disaggregation of data not systematically done.	methods established and implemented for VRB and introduces sex-disaggregated data collection protocols and methods	<p>economic survey in the Vrbas River Basin has been completed and it includes vulnerability assessment for women in flood risk areas in VRB.</p> <p>Institutions have been enabled with capacity proven through project implementation though with a need for further exposure and experience over the remaining project period</p>
Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in VRB	No, of people in target basin benefitting from FRM adaptation technologies, tools, and adaptation strategies, and are less exposed to flood risk	Current approach limited of inclusion of local communities, and particularly the vulnerable groups	At least 5 technologies transferred to 13 communities in community-based adaptation measures	<p>Participatory GIS, as a means of integrating local community information into the assessments of flood risk, has been developed as part the GIS-based socio-economic tool. Introduction of PGIS in municipalities is in progress. Community engagement, mobilization and sensitization strategy has been developed. It sets out the general community engagement steps for each of the stages of community involvement throughout the project. Hydrological and hydraulic (1D and 2D) models for the whole basin have been developed for the purpose of flood mapping. Hydrological models have been transferred to and are being operated by hydro-meteorological institutes and hydraulic models are handed over to water agencies. Flood hazard and risk maps have been handed over to water agencies and municipalities. Hydrological and 1D hydraulic models have been adjusted for the purpose of flood forecasting and early warning system. Flood depth-damage curve has been developed. Water information system has been upgraded and includes a platform for exchange of data among water agencies.</p> <p>Main tools for implementing new technologies have been implemented and respective trainings conducted. Further exposure of beneficiaries is</p>

				needed for ensuring sustainability. Community participation and involvement is excellent. Management and Modelling capacity in country is significantly improved though further exposure and on-the-job training is required for full sustainability
	No, of innovative non-structural measures introduced and implemented as part of climate adaptation strategies to provide improved resilience to communities (include agric.	Current approach to FRM is structural flood protection measures	Non-structural measures designed and implemented in 13 municipalities by 2020 At least 4,200 hectares of agric. land protected by non-structural measures (e.g. floodplain agro-forestry to be implemented on at least 840 hectares)	The first set of 10 non-structural measures in 7 municipalities has been selected. Implementation is to start in August 2017. Identification and selection of measures has been based on flood hazard and risk maps. Applicable and practical ways forward for the flood insurance model have been discussed. A final decision on the way forward is outstanding
	No of communities benefitting from introduced forecasting, early warning, response and recovery technologies to support local	FFEWS system currently disjointed and not fully electronically based	Fully integrated flood forecasting and early warning system implemented in VRB	Hydro-meteorological network in Vrbas River Basin has been established and real-time data transfer is enabled. Hydrological and hydraulic model for flood forecasting have been completed and selection of platform is in progress.

	communities at risk of flooding			
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4.3 Project Implementation and Adaptive Management

The project management team has built an effective management structure both considering the steering committee as well as through interaction with direct stakeholders and beneficiaries. During discussion with stakeholders, project management was praised as excellent considering all aspects of project applicability, progress and involvement. Decision making is transparent with stakeholders feeling involved and project reporting is in place and on time. The project team itself is well coordinated and complementary in their skills and responsibilities as well as well connected with stakeholders and beneficiaries.

Project objectives are being implemented through selected implementing partners with the support of a technical assistance team. Tasks have been well tackled so far and the partly previously less experienced implementing partners have gained experience through exposure and cooperation with the technical assistance team. While their skills and capacity has been improved care should be taken to further involve them to assure continued exposure and, in that way, promoting sustainability of the achieved capacity improvement. All interviewed implementing partners have shown a good understanding of their tasks and confirmed good cooperation with the technical assistance team and project management. The implementing partners are aware of the need for further exposure and consolidating capacity. A current limiting factor may also be the limited number of involved staff on the side of the implementing partners so that staff fluctuation may lead to serious loss of capacity. Products developed and delivered by the implementing partners have been derived with support, and/or reviewed by the technical assistance team, ensuring the required quality.

The project took an adaptive management approach from its start. During the donor coordination meeting held in 2015 and organized by the Ministry of Foreign Trade and Economic Relations and attended by representatives of UNDP, as well as EC, WB, EIB, SIDA and the International Sava River Basin Commission, a special focus was put on activities which need coordination and uniformity throughout the country, such as flood hazard and risk maps development and establishment of early warning system. Considering that at the time the WBIF funded project for flood hazard and flood risk mapping was almost a year late, and that it was not very likely to start shortly after the donor meeting, it was decided that, in addition to cross-section surveys, the project was to undertake a LiDAR survey of the VRB (Activity 2.1. of the Project Document). In that way, compatibility with the WBIF project was ensured and duplication of efforts and inconsistent products avoided. At the same time delay in the project implementation did not take place. This was done under existing budget anticipated for topographic survey.

An adaptive management aspect that has also been taken up by the project management team is the need to change the approach of the planned flood insurance schemes to a more practical approach applicable in BiH. The necessary adjustments are currently being discussed but given the complexity of implementing new insurance schemes, project management is advised to spend serious efforts on achieving results that are acceptable by all involved stakeholders. A critical aspect is the implementation of flood risk management plans for which it has been reported that the problems are related to missing regulatory and legal frameworks and hence are outside the control of the project. Project management is advised to continue supporting the government to work towards enabling legislation as a base for future flood risk management planning.

Work planning

Considering project progress and stakeholder satisfaction, work planning through the project management team is excellent, especially also ensuring full transparency and using participatory and result based approaches with the beneficiaries. The approach ensures ownership which was positively highlighted in all interviews. The project activities have been carried out in line with the AWP with significant efforts made to align project activities with other flood risk management projects in the country as well as developing pilot examples for hydrological and hydraulic modelling, flood hazard and risk mapping, and flood forecasting and early warning systems.

The project is mostly on target regarding its implementation status, the results framework has been used for assessing project progress during the scheduled project implementation reviews.

Finance and co-finance

The project finances are managed well, and no issues were apparent during the MTR. 1,425,485 USD or about 28% were spent in 2015 and 2016. Anticipated budget for 2017 is 1,274,419 USD, out of which 85% were spent till 20 Nov 2017. The planned spending for 2018 show 1,628,345 USD. The recorded as well as planned spendings are within budget and plausible given the overall project budget and implementation rate. Strong control over the budget by the project management is seen in project budget balance reports i.e. planned vs. disbursed funds, and budget revisions which are made to best suit project needs, but also stay within lines of budgeting guidelines.

GEF Outcome/Atlas Activity	AWP Year 1	Disbursement Year 1	Difference Year 1	AWP Year 2	Disbursement Year 2	Difference Year 2
Outcome 1	91,000	77,555	13,445	177,400	172,507	4,893
Outcome 2	362,000	354,811	7,189	508,400	497,455	10,945
Outcome 3	30,700	22,020	8,680	250,500	219,121	31,379
Outcome 4 - PM	33,200	32,273	927	54,111	49,744	4,373
Total	516,900	486,659	30,241	990,411	938,827	51,590

The project budget is reviewed bi-annually with the last revision conducted on 30. October 2017, showing a total project budget of 5,282,140 USD, i.e. 282,140 USD additional funding added to the original 5,000,000 USD project budget. This additional funding is municipal contributions for implementation of flood risk measures. These contributions have been sought to show municipal ownership and commitment for implementation of measures, as well as their ability to provide further maintenance of implemented flood risk management measures.

Municipality	Amount (BAM)
Laktasi	120,000.00
Srbac	20,926.17
Kotor Varos	43,842.75

Knezevo	12,264.90
Bugojno	95,971.24
Gornji Vakuf	32,996.97
Banja Luka	150,000.00
Total	476,002.03

Co-financing is provided as per the project document (PIMS) Annex 2 as follows.

Source of co-financing	Name of co-financier	Type of co-financing	Amount of co-financing	Invested during the period 2014-2017
National government	Ministry of Agriculture, Forestry and Water Management of Republic of Srpska	Cash	approx. 75,000,000 USD	BAM 67,913,932 app 41,950,000 USD
Multilateral agency	Sava River Basin Agency, Sarajevo	Cash	approx. 700,000 USD	BAM 1,142,443 app 705,650 USD
Multilateral agency	UNDP BiH, Sarajevo	Cash	1,500,000 USD	1,500,000 USD
<u>Total co-financing</u>			<u>approx. 77,200,000 USD</u>	

Co-financing letters are included in Section 6.8.

Project-level monitoring and evaluation system

The monitoring and evaluation work plan has been sufficiently budgeted and in line with standard UNDP procedures and SCCF (GEF) requirements. AWP's have been developed by the project staff and confirmed by the Project Board. PIR's have been confirmed by the Project Board and GEF operational focal point. A Regional Technical advisor is playing an important role in the quality control and provide critical and regular input, particularly on the technical reports and papers produced.

A project inception workshop was conducted and included all key stakeholders and role players. Involvement of the stakeholders continued throughout the project implementation leading to a strong sense of ownership of the project by the national partners. This is an important element contributing to the long-term sustainability of the project. The project inception report included the technical methodology, updated risk- and assumption tables, terms of reference for the main international experts and subcontractors, and also pointed out the need- and identified activities necessary for stakeholder coordination.

Two project implementation reviews (PIR) were conducted in 2016 and 2017. Both PIRs have rated the project to be on-track with its activities. PIR presented progress was discussed with stakeholders and has shown to be realistically described. MTR also confirmed the risks explained in PIR's.

A risk log has been regularly updated in ATLAS. Risk and assumptions were revised during project inception period. During MTR increase for prioritization of the risk: *Underestimation*

of project scope and requirements, has been suggested due to issues of flood risk management planning, flood insurance scheme and costs of agro-forestry measures. These implementation challenges are identified and elaborated on in sections 4.2. and 5. and are being worked on jointly by the project and government.

High quality of the risk management has been shown by project approach towards risk which were prioritized as high in the Project document and at the inception phase:

- Risks a) *Failure to identify key data sets. Delays in collecting essential data for the project. Risk of essential data not being available or to the quality or accuracy needed* and b) *Delays in availability of historical data, survey data leading to delays in starting the technical studies and modelling* have been overcome by undertaking detailed data requirements and data identification (identifying all sources), assisting local institutions in data digitalization, verification and analysis. Where data were not officially available (e.g. historical flood damage, land use, crop cultures etc.), data were collected on the field, from people who did assessments etc. Data collection was enforced within local institutions (hydro-meteorological institutes, water agencies, civil protection etc.), data quality issues were raised. Local institutions recognized this need and led the process of data improvement. Overcoming this risk has required and still requires huge efforts by both project staff and local institutions.
- A risk *Failure to reach agreement on new policy frameworks* still remains (e.g. development of the flood risk management plan) and will remain till the end of the project. So far, the project is managing this risk by involvement of all relevant institutions, active work of inter-agency working group and government ownership, also via strong inclusion of the Project Board.
- A risk *Unforeseen delays in undertaking essential surveys due to weather/access issues* was overcome by proper planning to maximise favourable weather conditions.
- A risk *Adverse climatic conditions may also pose risks to workforce health and safety, or damage adaptation measures being implemented* has been overcome by selection of contacts with high level of health-safety protocol for their employees.

UNDP Country Office Verification Missions have been conducted and a post-facto assessment of the CO projects' adherence to the basic UNDP rules and regulations took place in Mar 2017. The Mission covered operational activities of the project in the period 1 January to 31 December 2016.

Verification Mission Summary:

Ratings:

Verification Mission Areas	Not assessed/not applicable	Unsatisfactory	Partially satisfactory	Satisfactory
HR				
IC management	N/A			

Leave monitoring				satisfactory
International travel				satisfactory
Finance				
Hospitality	N/A			
Travel				satisfactory
Timely payments, Purchase order closure, etc.				satisfactory
General Services				
Procurement< US\$ 2,500				satisfactory
Procurement in general				satisfactory
Transportation				satisfactory
Inventory/Assets				satisfactory
Project support				
Filing				satisfactory
Budget revisions, Monthly disbursement plans, DPs, AWP				satisfactory
Atlas project management and reporting			partially satisfactory	
Result Based Management aspect of Atlas PM				satisfactory

GEF Tracking Tool for Climate Change Adaptation Projects

In addition to the results framework the project is monitored using the GEF tracking tool. Due to changes made in the tool between the old version used during the project preparation phase and the new version, comparison is not directly possible, as the tool has been revised completely in its structure, now containing 14 indicators and 4 questions. The new tracking tool is annexed in a separate file. Project management has selected indicators 1, 6, 7, 8, 10 and 13 as the most appropriate to reflect project progress. MTR agrees with the selected indicators and advises further monitoring of the same.

Stakeholders

Stakeholders have been specifically interviewed during the MTR in order to obtain information regarding stakeholder involvement and ownership. Stakeholders confirmed that the project has an excellent track record of stakeholder engagement starting from project design through implementation with periodic steering committee meetings taking place and stakeholders and beneficiaries on all levels being involved in the definition of detailed project details and decision making, which is well appreciated and leading to an excellent ownership mentality and support of project activities from local-, entity- and national government side.

The steering committee (Project Board) plays an integral part in managing the Vrbas project, with periodic meetings taking place twice a year including reporting on progress as well as on planned activities. The interviewed steering committee members confirmed good cooperation and involvement in project management aspects.

Reporting

Project reporting has been conducted as planned, showing good quality and depth.

Communication

Communication in the project has been reported as excellent by interviewed stakeholders on all levels. The steering committee is fully involved in processes and interviewed entity as well as municipal institutions expressed their full satisfaction with project communication, contributing in full ownership on beneficiary side and respective sustainability. Communication is regular and effective.

Overall, project implementation and adaptive management is rated as: Highly Satisfactory (HS)

4.4 Sustainability

Given the excellent stakeholder- and beneficiary involvement in the project, ownership and sustainability of project interventions during the project implementation period are rated as moderately likely. In addition to the institutional involvement and ownership the project design regarding capital investments (i.e. the project providing the necessary capital investments) as well as the confirmed commitment of the government and benefitting institutions allows to assume that long term sustainability of the project beyond the project end date is a strong interest of the government institutions.

Financial risk to sustainability

Financial capacity to operate and maintain the implemented improvements may anyhow be problematic in the long term. Despite this fact government stakeholders have in addition voiced interest in upscaling project results, though depending on funding opportunities. Before taking this step, a strategy for long term financial sustainability beyond donor involvement needs to be defined.

Particularly, finding ways for building up funds for operation and maintenance of the implemented improvements, maintenance and improvement of hydro-meteorological

network and flood forecasting and early warning system and moreover, maintaining and replacing capital investments will be a challenging requirement for the involved government institutions to ensure long term sustainability. This is currently not given but the problem is identified. Stakeholders have clearly voiced that currently there is no budget available for long term capital intensive maintenance as well as suitable staffing and that legal adjustments and suitable funding sources would be necessary to allow for sustainable financing. Although this issue is yet to be systematically resolved, there is a certain progress recorded. With project advocacy, the amount of BAM 50,000 has been allotted to the Hydro-Meteorological institute for network maintenance for the year 2018. This amount is certainly not enough but represent a good start. Understanding the importance of the FFEWS, water agencies have signed a cost-sharing agreement with UNDP to co-finance 30% of the FFEWS set-up. This certainly shows their will and ability to take over the functioning of the system and assure its sustainability. Tackling long-term sustainability before project closure is therefore a major requirement and will be a major benefit for long term financial sustainability. Given the populations memory of the recent devastating flood events, this may be an opportune time to develop accepted public funding mechanisms including the necessary legal and fiduciary instruments for long term financing.

Socio-economic risks to sustainability

The project is properly documenting its results and lessons learnt, all project activities are continually shared with and handed-over to authorized institutions, thus making socio-economic risk insignificant.

Institutional framework and governance risk to sustainability

All project activities are done in line with the existing regulatory framework. Activities which support legal and policy changes are done with significant involvement of relevant stakeholder, ensuring that final products are institutionally supported. Technical knowledge transfer is constantly ongoing, during as well as after activity completion, with e.g. technical staff in water agencies receiving continued training on modelling and water information system utilization.

Environmental

There is no environmental risk to project sustainability.

Overall project sustainability is rated as: Moderately Likely (ML)

5 Conclusions and Recommendations

The Technology Transfer for Climate Resilient Flood Management in Vrbas River Basin project is innovative, ground-breaking and ambitious. It has created a precedent in river basin management in Bosnia and Herzegovina and has laid the foundations for a more robust, and efficient management of climate change adaption measures for flood risk management in BiH. It responds to the needs at state-, entity- and local levels and contributes to developing capacities to enable the country to adapt to climate change and develop its resilience. The project is implementing good practices that need to be maintained and up-scaled.

The project is being implemented in the Vrbas River Basin, while approaches, the developed methodologies and specifically the lessons learned are of significant value also in other basins in the country. The project results therefore will be good practice examples for any upscaling endeavors as already requested by the government. Further, it is likely that political consensus for the required legislation as the base for the planned flood risk management planning and flood insurance may take its time so that full impact of these activities can only be achieved in a successive project.

Upscaling in this regard needs to take into account the specific contexts in the different basins in BiH and consider these in any planning approach, requiring a detailed situational analysis and adaptation of the approaches, methodologies and solutions to the specific needs. It is recommended that a guideline for upscaling as well as for adaptation is being developed for the different main project activities, specifically also describing the needs assessment to capture economic, social, institutional, legal and technical as well as capacity related conditions and requirements in other basins as they may vary from the Vrbas River basin. The best approach for upscaling will be via development of a project proposal that will focus on replication of lessons learnt and results achieved within the current project. Adaptation approaches can e.g. be found in "Managing Extreme Flood Events – Analyzing, forecasting, warning, protecting and informing - case studies from the RIMAX projects". 2009. G. Petersen, UNESCO-IHP/WMO-HWRP Series 9, ISSN 1614-1180. The publication specifically describes what to consider for adapting and scaling flood management approaches to other situations.

The upscaling will in addition be useful to consolidate project results and provide more exposure to involved stakeholders. Knowledge transfer in-between stakeholder groups can be utilized and facilitated building significant in-country capacity. An important aspect in considerations for upscaling will anyhow be the financial requirements for BiH to operate and maintain an even larger upscaled flood risk management system in the country in a sustainable manner. Also, in this context, less budget intensive approaches considering the "living with floods" concept may be chosen over capital intensive or maintenance intensive solutions.

For broader exposure and learning experience it may in addition be very beneficial to conduct regional workshops with UNDP projects from other countries where flood risk management strategies and works have been implemented.

As already mentioned at the time of the MTR, all indicators are on target to be achieved with several potential issues identified for implementation of future activities. Relevant and necessary adjustments to the project outputs / outcomes as e.g. to adjust to the delay in

development of the flood risk management plan, insurance approach and implementation of agro-forestry measures, are considered practical necessities that require adaptation and not barriers.

1. Flood risk management planning: The project should continue supporting development of by-laws regulating development of the flood risk management plan and continue with development of the Vrbas River Basin flood risk management plan as a pilot for the rest of BiH. The project is on good track to do so and pending political and Project Board consensus, the development of the flood risk management plan using a methodology that can be replicated in other river basins in the country should be initiated.

2. Implementation of agro-forestry measures should be explored in a way that beneficiaries are directly involved and carry out part of the job which can be done with their own efforts e.g. the project can provide seedlings to municipalities or farmers for planting.

3. Development of insurance model enjoys full support from local authorities who understand a need for this, as it is the best way to take *ex-ante* approach and take off the burden of flood recovery from public budget. The approach is fully supported by insurance companies, as they see it as a business opportunity which they cannot utilize if the current status quo remains. It is evident that index-based insurance can currently not be applied in BiH as it would require major law changes starting with obligatory law. BiH regulations state that damage can be paid only if proven that it actually took place and to the extent determined, which is contrary to index-based insurance approaches, according to which compensation is to be paid if certain hydro-meteorological triggers are met. The MTR suggests developing insurance models with applicable tariffs to be discussed with stakeholders. Simulation of the model can be initiated in pilot municipalities. The application of “solidarity” principles is to be explored to ensure necessary insurance take-up and to avoid putting a burden on the most vulnerable.

A recommendation table is included into section 1.5.

6.1 MTR ToR (excluding ToR annexes)

1. INTRODUCTION

This is the Terms of Reference (ToR) for the UNDP-GEF Midterm Review (MTR) of the *full or medium-sized* project titled *Technology Transfer for Climate Resilient Flood Management in Vrbas River Basin* (PIMS#5241) implemented through the *United Nations Development Programme*, which is to be undertaken in 2017. The project started on the 23 April, 2015 and is in its *third* year of implementation. In line with the UNDP-GEF Guidance on MTRs, this MTR process was initiated before the submission of the second Project Implementation Report (PIR). This ToR sets out the expectations for this MTR. The MTR process must follow the guidance outlined in the document *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* (http://web.undp.org/evaluation/documents/guidance/GEF/mid-term/Guidance_Midterm%20Review%20EN_2014.pdf).

2. PROJECT BACKGROUND INFORMATION

“Technology transfer for climate resilient flood management in Vrbas River Basin” is a 5-year SCCF (Special Climate Change Fund) funded USD 5 mil project, which started in April 2015.

The Project will enable the government of Bosnia and Herzegovina and communities of the Vrbas basin to adapt to flood risk through the transfer of adaptation technologies for climate resilient flood management and embark on climate resilient economic activities.

The project will enable strategic management of flood risk through the legislative and policy framework and appropriate sectoral policies and plans that incorporate climate change considerations. In order to develop institutional and local capacities in Flood Risk Management (FRM) the project aims to:

- upgrade and rehabilitate hydrometric monitoring network,
- develop flood risks and flood hazard maps for the Vrbas river basin,
- develop a flood forecasting system and early warning system,
- develop Flood Risk Management plan for Vrbas river basin,
- develop emergency response plans, and provide trainings in flood-specific civil protection,
- provide targeted training on FRM to practitioners and decisions makers,
- prepare institutional capacity development plan for the long-term development of capability and capacity in Flood Risk Management,
- implement non-structural interventions in municipalities of the Vrbas river basin,
- provide training to local communities in climate resilient FRM, and introduce community-based early warning systems,
- prepare and implement municipal-level flood response and preparedness plans,
- implement agro-forestation scheme
- introduce financial instruments such as index-based flood insurance and credit deference schemes as a means of compensating for flood damages for agriculture.

Bosnia and Herzegovina (BiH) is a middle-income country which is still recovering from the 1992-1995 war which had a devastating impact on its human, social and economic resources, leading to enormous challenges of the post-war reconstruction and economic and social recovery. This challenge has been further compounded by the transition towards market economy requiring structural reforms and improved governance. The slow rate of the post-war economic recovery of Bosnia and Herzegovina has been compounded by the negative impacts of climate change on key sectors such as agriculture, energy (hydropower), the environment and, in particular, the frequency and magnitude of flood disasters, which have tripled in frequency in the last decade. In May 2014, Bosnia and Herzegovina experienced its worst flooding in 150 years which resulted in 23 deaths and \$2.7 Billion USD worth of damages which is 15% of

GDP, and is expected to result in a 1.1 percent contraction in the economy this year, compared to the growth of 2.2 percent that had been predicted before the flood.

BiH is significantly exposed to the threats of climate change, but has very limited capacity to address and adapt to its negative impacts, in particular the frequency and magnitude of floods from its major rivers. The Vrbas River basin is characterized by a large rural population comprised of the poorest and most vulnerable communities in BiH, including war returnees and displaced people, with high exposure to flooding and its devastating impacts.

3. OBJECTIVES OF THE MTR

The MTR will assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project's strategy, its risks to sustainability.

4. MTR APPROACH & METHODOLOGY

The MTR must provide evidence based information that is credible, reliable and useful. The MTR Consultant will review all relevant sources of information including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Environmental & Social Safeguard Policy, the Project Document, project reports including Annual Project Review/PIRs, project budget revisions, lesson learned reports, national strategic and legal documents, and any other materials that the team considers useful for this evidence-based review). The MTR Consultant will review the baseline GEF focal area Tracking Tool submitted to the GEF at CEO endorsement, and the midterm GEF focal area Tracking Tool that must be completed before the MTR field mission begins.

The MTR Consultant is expected to follow a collaborative and participatory approach⁴ ensuring close engagement with the Project Team, government counterparts (the GEF Operational Focal Point), the UNDP Country Office(s), UNDP-GEF Regional Technical Advisers, and other key stakeholders.

Engagement of stakeholders is vital to a successful MTR.⁵ Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to *(list)*; executing agencies, senior officials and task team/ component leaders, key experts and consultants in the subject area, Project Board, project stakeholders, academia, local government and CSOs, etc. Additionally, the MTR Consultant is expected to conduct field missions to Bosnia and Herzegovina including the following project sites *(Banja Luka, Sarajevo, Vrbas river basin municipalities)*.

The final MTR report should describe the full MTR approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the review.

5. DETAILED SCOPE OF THE MTR

The MTR Consultant will assess the following four categories of project progress. See the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for extended descriptions.

i. Project Strategy

Project design:

- Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.

⁴ For ideas on innovative and participatory Monitoring and Evaluation strategies and techniques, see [UNDP Discussion Paper: Innovations in Monitoring & Evaluating Results](#), 05 Nov 2013.

⁵ For more stakeholder engagement in the M&E process, see the [UNDP Handbook on Planning, Monitoring and Evaluating for Development Results](#), Chapter 3, pg. 93.

- Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Were lessons from other relevant projects properly incorporated into the project design?
- Review how the project addresses country priorities. Review country ownership. Was the project concept in line with the national sector development priorities and plans of the country (or of participating countries in the case of multi-country projects)?
- Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, taken into account during project design processes?
- Review the extent to which relevant gender issues were raised in the project design. See Annex 9 of *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for further guidelines.
- If there are major areas of concern, recommend areas for improvement.

Results Framework/Logframe:

- Undertake a critical analysis of the project's logframe indicators and targets, assess how "SMART" the midterm and end-of-project targets are (Specific, Measurable, Attainable, Relevant, Time-bound), and suggest specific amendments/revisions to the targets and indicators as necessary.
- Are the project's objectives and outcomes or components clear, practical, and feasible within its time frame?
- Examine if progress so far has led to, or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women's empowerment, improved governance etc...) that should be included in the project results framework and monitored on an annual basis.
- Ensure broader development and gender aspects of the project are being monitored effectively. Develop and recommend SMART 'development' indicators, including sex-disaggregated indicators and indicators that capture development benefits.

ii. Progress Towards Results

Progress Towards Outcomes Analysis:

- Review the logframe indicators against progress made towards the end-of-project targets using the Progress Towards Results Matrix and following the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects*; colour code progress in a "traffic light system" based on the level of progress achieved; assign a rating on progress for each outcome; make recommendations from the areas marked as "Not on target to be achieved" (red).

Table. Progress Towards Results Matrix (Achievement of outcomes against End-of-project Targets)

Project Strategy	Indicators	Baseline	Targets End of Project	Source of verification	Risks and Assumption s
Project Objective:	Number of new technologies transferred to BiH as part of a methodology for strategic FRM	Limited institutional capacity and technologies in use for strategic FRM in BiH	At least 5 new technologies introduced (hydrological and hydrodynamic modelling, state-of-the-art monitoring equipment, Flood	Project monitoring reports and final evaluation Survey of Adopted policies and plans	Risk: Government bodies do not pay sufficient attention to climate change Government s on state and entity level are not
To transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin					

	AMAT indicator 3.1.1.1 Type of adaptation technologies transferred to the target groups.		forecasting and early warning systems, flood damages and losses modelling and vulnerability assessment, and a number of non-structural flood management technologies to BiH)	Survey of Technologies in place	able to reach an agreement on supportive regulatory documents and management plans Risk rating: low Assumption: Government will understand importance of CC induced flood risk management and provide support to regulatory documents
	VRB (12% of BiH territory) covered by an automated hydrometric monitoring network for effective Flood Forecasting and Early Warning	Hydrometric stations currently cover 50% of the area required for FFEWS for VRB	The VRB (i.e.12% of BiH) covered by a Hydrometric network that provides the optimal coverage required for FFEWS		
Outcome 1: Key relevant development strategies/policies/legislations integrate climate change resilient flood management approaches	AMAT Indicator 3.2.1 Policy environment and regulatory framework for adaptation related technology transfer established or	1: No policy/regulatory framework for adaptation related technology transfer in place	4: Policy/regulatory framework for adaptation related technology transfer have been formally adopted by the Government but have no	Project annual reports, Mid-term evaluation, final report Survey of Policy/regulatory framework in place	Risk: Consent to Policy/regulatory framework not given by all government levels Risk rating: Low Assumption: political

	strengthened		enforcement mechanisms		support provided
	No, of Adaptation technology solutions for climate resilient flood management (CRFRM) enabled for implementation	0: Document codifying standard methodologies and procedures for Climate resilient flood Risk Management (CRFRM)	At least 10 guidance documents produced on Climate Resilient Flood Risk Management topics	Project annual reports, Mid-term evaluation, final report Survey of Guidance documents developed	No risks identified
Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities	AMAT Indicator 3.2.2: Strengthened Capacity to transfer appropriate adaptation technologies	1: Very few professional are aware of adaptation technologies	3: High Capacity achieved (>75%). Provision of models, information systems, tools and training in the use of these to professionals, on various aspects of climate adaptation technologies	Project annual reports, Mid-term evaluation, final report	Risk: Management of relevant institutions do not recognise a need to such a training Risk rating: low Assumption: a need for a training recognized
	No, of institutions enabled to modify risk management strategies based on introduced vulnerability, loss and damages assessment	Most of the socio-economic information required to assess flood damages, losses, exposure and vulnerability is not	GIS-based flood damages, losses and vulnerability assessment tool developed for VRB and systematic socio-economic	Project annual reports, Mid-term evaluation, final report GIS data base	Risk: institutions not willing to provide and/or do not have data Risk rating: medium

	and improved hydrometric monitoring technologies	currently available and is not collected systematically and gender-disaggregation of data not systematically done.	survey methods established and implemented for VRB and introduces sex-disaggregated data collection protocols and methods		Assumption: data will be gathered on the field
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Indicator Assessment Key

Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved
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In addition to the progress towards outcomes analysis:

- Compare and analyse the GEF Tracking Tool at the Baseline with the one completed right before the Midterm Review.
- Identify remaining barriers to achieving the project objective in the remainder of the project.
- By reviewing the aspects of the project that have already been successful, identify ways in which the project can further expand these benefits.

iii. Project Implementation and Adaptive Management

Management Arrangements:

- Review overall effectiveness of project management as outlined in the Project Document. Have changes been made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Recommend areas for improvement.
- Review the quality of execution of the Executing Agency/Implementing Partner(s) and recommend areas for improvement.
- Review the quality of support provided by the GEF Partner Agency (UNDP) and recommend areas for improvement.

Work Planning:

- Review any delays in project start-up and implementation, identify the causes and examine if they have been resolved.
- Are work-planning processes results-based? If not, suggest ways to re-orientate work planning to focus on results?
- Examine the use of the project's results framework/ logframe as a management tool and review any changes made to it since project start.

Finance and co-finance:

- Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions.
- Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions.
- Does the project have the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds?

- Informed by the co-financing monitoring table to be filled out, provide commentary on co-financing: is co-financing being used strategically to help the objectives of the project? Is the Project Team meeting with all co-financing partners regularly in order to align financing priorities and annual work plans?

Project-level Monitoring and Evaluation Systems:

- Review the monitoring tools currently being used: Do they provide the necessary information? Do they involve key partners? Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required? How could they be made more participatory and inclusive?
- Examine the financial management of the project monitoring and evaluation budget. Are sufficient resources being allocated to monitoring and evaluation? Are these resources being allocated effectively?

Stakeholder Engagement:

- Project management: Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders?
- Participation and country-driven processes: Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation?
- Participation and public awareness: To what extent has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives?

Reporting:

- Assess how adaptive management changes have been reported by the project management and shared with the Project Board.
- Assess how well the Project Team and partners undertake and fulfil GEF reporting requirements (i.e. how have they addressed poorly-rated PIRs, if applicable?)
- Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.

Communications:

- Review internal project communication with stakeholders: Is communication regular and effective? Are there key stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and investment in the sustainability of project results?
- Review external project communication: Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?)
- For reporting purposes, write one half-page paragraph that summarizes the project's progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits.

iv. Sustainability

- Validate whether the risks identified in the Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module are the most important and whether the risk ratings applied are appropriate and up to date. If not, explain why.
- In addition, assess the following risks to sustainability:

Financial risks to sustainability:

- What is the likelihood of financial and economic resources not being available once the GEF assistance ends (consider potential resources can be from multiple sources, such as the public and private sectors, income generating activities, and other funding that will be adequate financial resources for sustaining project's outcomes)?

Socio-economic risks to sustainability:

- Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project? Are lessons learned being documented by the Project Team on a continual basis and shared/ transferred to appropriate parties who could learn from the project and potentially replicate and/or scale it in the future?

Institutional Framework and Governance risks to sustainability:

- Do the legal frameworks, policies, governance structures and processes pose risks that may jeopardize sustenance of project benefits? While assessing this parameter, also consider if the required systems/ mechanisms for accountability, transparency, and technical knowledge transfer are in place.

Environmental risks to sustainability:

- Are there any environmental risks that may jeopardize sustenance of project outcomes?

Conclusions & Recommendations

The MTR Consultant will include a section of the report setting out the MTR's evidence-based conclusions, in light of the findings.⁶

Recommendations should be succinct suggestions for critical intervention that are specific, measurable, achievable, and relevant. A recommendation table should be put in the report's executive summary. See the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for guidance on a recommendation table.

The MTR Consultant should make no more than 15 recommendations total.

Ratings

The MTR Consultant will include its ratings of the project's results and brief descriptions of the associated achievements in a *MTR Ratings & Achievement Summary Table* in the Executive Summary of the MTR report. See Annex E for ratings scales. No rating on Project Strategy and no overall project rating is required.

Table. MTR Ratings & Achievement Summary Table for *Technology transfer of climate resilient flood management in Vrbas River Basin*

Measure	MTR Rating	Achievement Description
Project Strategy	N/A	
Progress Towards Results	Objective Achievement Rating: (rate 6 pt. scale)	
	Outcome 1 Achievement Rating: (rate 6 pt. scale)	
	Outcome 2 Achievement	

⁶ Alternatively, MTR conclusions may be integrated into the body of the report.

	Rating: (rate 6 pt. scale)	
	Outcome 3 Achievement Rating: (rate 6 pt. scale)	
	Etc.	
Project Implementation & Adaptive Management	(rate 6 pt. scale)	
Sustainability	(rate 4 pt. scale)	

6. TIMEFRAME

The total duration of the MTR will be approximately max 20 days over a time period of *16 weeks* starting *01 November, 2017*, and shall not exceed five months from when the consultant(s) are hired. The tentative MTR timeframe is as follows:

TIMEFRAME	ACTIVITY
<i>30 March 2017</i>	Application closes
<i>30 April 2017</i>	Select MTR Consultant
<i>30 September 2017</i>	Prep the MTR Consultant (handover of Project Documents)
<i>10 Nov 2017</i>	Document review and preparing MTR Inception Report
<i>30 Nov 2017</i>	Finalization and Validation of MTR Inception Report- latest start of MTR mission
<i>15 December 2017 (7 days including travel)</i>	MTR mission: stakeholder meetings, interviews, field visits
<i>15 December 2017</i>	Mission wrap-up meeting & presentation of initial findings- earliest end of MTR mission
<i>30 December 2017</i>	Preparing draft report
<i>31 January 2018</i>	Incorporating audit trail from feedback on draft report/Finalization of MTR report (note: accommodate time delay in dates for circulation and review of the draft report)
<i>07 Feb 2018</i>	Preparation & Issue of Management Response
n/a	(optional) Concluding Stakeholder Workshop (not mandatory for MTR Consultant)

15 Feb 2018	Expected date of full MTR completion
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Options for site visits should be provided in the Inception Report.

7. MIDTERM REVIEW DELIVERABLES

#	Deliverable	Description	Timing	Responsibilities
1	MTR Inception Report	MTR Consultant clarifies objectives and methods of Midterm Review	No later than 2 weeks before the MTR mission: 10 Nov 2017	MTR Consultant submits to the Commissioning Unit and project management
2	Presentation	Initial Findings	End of MTR mission: 15 Dec 2017	MTR Consultant presents to project management and the Commissioning Unit
3	Draft Final Report	Full report (using guidelines on content outlined in Annex B) with annexes	Within 3 weeks of the MTR mission: 30 Dec 2017	Sent to the Commissioning Unit, reviewed by RTA, Project Coordinating Unit, GEF OFP
4	Final Report*	Revised report with audit trail detailing how all received comments have (and have not) been addressed in the final MTR report	Within 1 week of receiving UNDP comments on draft: 15 Feb 2018	Sent to the Commissioning Unit

*The final MTR report must be in English. If applicable, the Commissioning Unit may choose to arrange for a translation of the report into a language more widely shared by national stakeholders.

8. MTR ARRANGEMENTS

The principal responsibility for managing this MTR resides with the Commissioning Unit. The Commissioning Unit for this project's MTR is *UNDP Country Office*.

The commissioning unit will contract the consultants and ensure the timely provision of per diems and travel arrangements within the country for the MTR Consultant. The Project Team will be responsible for liaising with the MTR Consultant to provide all relevant documents, set up stakeholder interviews, and arrange field visits.

9. TEAM COMPOSITION

An independent consultants will conduct the MTR - with experience and exposure to projects and evaluations in other regions globally. The consultant cannot have participated in the project preparation, formulation, and/or implementation (including the writing of the Project Document) and should not have a conflict of interest with project's related activities.

The selection of consultants will be aimed at maximizing the overall "team" qualities in the following areas: Recent experience with result-based management evaluation methodologies;

- Experience applying SMART indicators and reconstructing or validating baseline scenarios;

- Competence in adaptive management, as applied to climate changes;
- Experience working with the GEF or GEF-evaluations;
- Experience working in UNDP RBEC region,
- Work experience in relevant technical areas for at least 10 years;
- Demonstrated understanding of issues related to gender and *GEF Focal Area*; experience in gender sensitive evaluation and analysis.
- Excellent communication skills;
- Demonstrable analytical skills;
- Project evaluation/review experiences within United Nations system will be considered an asset;
- A Master's degree in *Environmental field or related area*, or other closely related field.

10. PAYMENT MODALITIES AND SPECIFICATIONS

10% of payment upon approval of the final MTR Inception Report

30% upon submission of the draft MTR report

60% upon finalization of the MTR report

Or, as otherwise agreed between the Commissioning Unit and the MTR Consultant.

11. APPLICATION PROCESS⁷

Recommended Presentation of Proposal:

- Letter of Confirmation of Interest and Availability** using the [template](#)⁸ provided by UNDP;
- CV and a Personal History Form** ([P11 form](#))⁹;
- Brief description of approach to work/technical proposal** of why the individual considers him/herself as the most suitable for the assignment, and a proposed methodology on how they will approach and complete the assignment; (max 1 page)
- Financial Proposal** that indicates the all-inclusive fixed total contract price and all other travel related costs (such as flight ticket, per diem, etc), supported by a breakdown of costs, as per template attached to the Letter of Confirmation of Interest template. If an applicant is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the applicant must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP.

All application materials should be submitted to the address registry@undp.ba indicating the following reference “Consultant for *Technology transfer of climate resilient flood management in Vrbas River Basin* Midterm Review” or by email at the following address ONLY: registry@undp.ba by noon **20 March, 2017**. Incomplete applications will be excluded from further consideration.

Criteria for Evaluation of Proposal: Only those applications which are responsive and compliant will be evaluated. Offers will be evaluated according to the Combined Scoring method – where the educational background and experience on similar assignments will be weighted at 70% and the price proposal will weigh as 30% of the total scoring. The applicant receiving the Highest Combined Score that has also accepted UNDP's General Terms and Conditions will be awarded the contract.

⁷ Engagement of the consultants should be done in line with guidelines for hiring consultants in the POPP: <https://info.undp.org/global/popp/Pages/default.aspx>

⁸

<https://intranet.undp.org/unit/bom/psd/Support%20documents%20on%20IC%20Guidelines/Template%20for%20Confirmation%20of%20Interest%20and%20Submission%20of%20Financial%20Proposal.docx>

⁹ http://www.undp.org/content/dam/undp/library/corporate/Careers/P11_Personal_history_form.doc

6.2 MTR evaluative matrix

Evaluative Questions	Indicators	Sources	Methodology
Project Strategy: To what extent is the project strategy relevant to country priorities, country ownership, and the best route towards expected results?			
Is the project design relevance to country needs?	Responsiveness to country needs, are the right problems addressed	Stakeholders	Consultation
Is the Results Framework suitable?	Is the Results Framework SMART?	Documents	Review
Progress Towards Results: To what extent have the expected outcomes and objectives of the project been achieved thus far?			
Is progress towards outcomes satisfactory?	Indicators as per results framework and workplan implementation	Documents (results framework, workplan) Stakeholders	Review Consultation
Project Implementation and Adaptive Management: Has the project been implemented efficiently, cost-effectively, and been able to adapt to any changing conditions thus far? To what extent are project-level monitoring and evaluation systems, reporting, and project communications supporting the project's implementation?			
Are management arrangements efficient?	Acceptance and understanding by stakeholders	Project management team Stakeholders	Interview Consultation
Is work planning efficient and transparent?	Acceptance and understanding by stakeholders	Project management team Stakeholders	Interview Consultation
How is project monitoring conducted?	Availability of monitoring documents (PIRs)	Project management team	Interview
Is stakeholder engagement sufficient?	Understanding and ownership of stakeholders	Stakeholders	Consultation
Is reporting sufficient?	Availability and quality of reports vs. reporting schedule	Documents	Review
Is communication sufficient?	Stakeholder satisfaction	Stakeholders Project management team	Consultation Interview
Sustainability: To what extent are there financial, institutional, socio-economic, and/or environmental risks to sustaining long-term project results?			

Are there financial risks to sustainability?	Available financing mechanisms and legal framework	Stakeholders Project management team	Consultation Interview
Are there socio-economic risks to sustainability?	Socioeconomic situation	Stakeholders Project management team	Consultation Interview
Are there institutional framework and governance risks to sustainability?	Institutional framework situation	Stakeholders Project management team	Consultation Interview
Are there environmental risks to sustainability?	Environmental aspects	Stakeholders Project management team	Consultation Interview

6.3 Example Questionnaire or Interview Guide used for data collection

Interviews were held with the approach and questions tailored to the specific position, role and expertise of the interviewed person. In general, questions used for the stakeholder interviews to understand the stakeholders involvement included (but were not limited to):

- Role in daily work
- Role and involvement in project, understanding of project
- Involvement in project development?
- Involvement in project execution?
- Transparency / communication?
- Relevance / need orientation?
- Sustainability / gaps?
- Outcome achievement? efficient project? flexible? adapted to local needs?
- Risks with the project?

6.4 Ratings Scales

MTR rating scale

Ratings for Progress Towards Results: (one rating for each outcome and for the objective)		
6	Highly Satisfactory (HS)	The objective/outcome is expected to achieve or exceed all its end-of-project targets, without major shortcomings. The progress towards the objective/outcome can be presented as “good practice”.
5	Satisfactory (S)	The objective/outcome is expected to achieve most of its end-of-project targets, with only minor shortcomings.
4	Moderately Satisfactory (MS)	The objective/outcome is expected to achieve most of its end-of-project targets but with significant shortcomings.
3	Moderately Unsatisfactory (HU)	The objective/outcome is expected to achieve its end-of-project targets with major shortcomings.
2	Unsatisfactory (U)	The objective/outcome is expected not to achieve most of its end-of-project targets.
1	Highly Unsatisfactory (HU)	The objective/outcome has failed to achieve its midterm targets, and is not expected to achieve any of its end-of-project targets.

Ratings for Project Implementation & Adaptive Management: (one overall rating)		
6	Highly Satisfactory (HS)	Implementation of all seven components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as “good practice”.
5	Satisfactory (S)	Implementation of most of the seven components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action.
4	Moderately Satisfactory (MS)	Implementation of some of the seven components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.
3	Moderately Unsatisfactory (MU)	Implementation of some of the seven components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.
2	Unsatisfactory (U)	Implementation of most of the seven components is not leading to efficient and effective project implementation and adaptive management.
1	Highly Unsatisfactory (HU)	Implementation of none of the seven components is leading to efficient and effective project implementation and adaptive management.

Ratings for Sustainability: (one overall rating)

4	Likely (L)	Negligible risks to sustainability, with key outcomes on track to be achieved by the project's closure and expected to continue into the foreseeable future
3	Moderately Likely (ML)	Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review
2	Moderately Unlikely (MU)	Significant risk that key outcomes will not carry on after project closure, although some outputs and activities should carry on
1	Unlikely (U)	Severe risks that project outcomes as well as key outputs will not be sustained

6.5 MTR mission itinerary

Monday 27 Nov – meetings in Sarajevo

- Project manager
- CO representatives: Sanjin Avdic, Energy and Environment sector leader and Sukhrob Khoshmukhamedov, deputy Resident representative
- Mr. Senad Oprasic GEF operational focal point
- Mr. Bosko Kenjic, Head of Water Resources Department, Ministry of Foreign Trade and Economic Relations

Tuesday 28 Nov - trip to and meetings in Bugojno and Banja Luka

- Trip to Bugojno
- Municipality Bugojno
- Visit to construction site
- Trip to Banja Luka
- Banja Luka municipal civil protection
- Representatives of Faculty of Natural Sciences

Wednesday 29 Nov – meetings in Banja Luka

- Representatives of Republika Srpska Ministry of Agriculture, Forestry and Water Management
- Representatives of the Ministry of Spatial Planning, Civil Engineering and Ecology, UNFCCC and GCF focal point
- Republika Srpska Hydro-Meteo Institute
- Visit to municipality Laktasi

Thursday 30 Nov - meetings in Bijeljina

- Trip to Bijeljina
- Water Agency
- Water Institute (private company)
- Trip to Sarajevo

Friday 01 Dec – meetings in Sarajevo

- Federal Hydro-Meteo Institute
- Representative of NGO
- Wrap up

6.6 List of persons interviewed

Name	Position	Organization	Location
Raduska Cupac	Project manager	UNDP	Sarajevo
Sanjin Avdic	Sector Leader Energy and Environment Sector	UNDP	Sarajevo
Sukhrob Khoshmukhamedov	deputy Resident representative	UNDP	Sarajevo
Senad Oprasic	GEF operational focal point, Head of environment protection department	Min of Foreign Trade and Economic Relations	Sarajevo
Bosko Kenjic	Head of water resources department, PB member	Ministry of Foreign Trade and Economic Relations	Sarajevo
Mirsad Karadza	Head of Civil Protection department,	Bugojno Municipality	Bugojno
Nenad Djukic	project steering board member	Ministry of Agriculture, Forestry and Water Management, Republika Srpska	Banja Luka
Zeljko Obradovic, Mile Lazendic	Chief of operation and communication center	Civil Protection Banja Luka Municipality	Banja Luka
Svjetlana Radusin	Assistant Minister for Ecology	Ministry of Spatial planning, civil engineering and ecology	Banja Luka
Minister Srebrenka Golic	Chair of the PB, UNFCCC and GCF focal point	Ministry of Spatial planning, civil engineering and ecology	Banja Luka
Zoran Bozovic, Darko Borojevic	Director and Head of Hydrology department	Republika Srpska Hydro-meteo institute	Banja Luka
Dr Goran Trbic, Dr Davorin Bajic	lead CC expert, GIS expert	Faculty of Sciences	Banja Luka
Miroslav Babic, Milovan Cosic	Municipality employees	Celinac municipality	Celinac
Margaretta Ayoung	CTA	Consultant to UNDP	-

Dejana Markovic, Ozren Djuric, Jelena Vicanovic	Senior advisers	Water Agency	Bijeljina
Nedeljko Sudar, Vujadin Blagojevic	Director, Director Technical Issues	Water institute	Bijeljina
Almir Bijedic, Esena Kupusovic	Director and Head of Hydrology department	Federal Hydro- meteo institute of Federation of BiH	Sarajevo
Nataly Olofinskaya	Regional Technical Advisor	UNDP	Istanbul
Edin Zahirovic	Lead socio-economic expert	NGO Centre for Development and Support	Sarajevo

6.7 List of documents reviewed

2017-PIR-PIMS5241-GEFID5604.docx Title: 2017 Project Implementation Review (PIR)	Basic Data, Overall Ratings, Development Progress, Implementation Progress, Critical Risk Management, Adjustments, Ratings and Overall Assessments, Gender, Communicating Impact , Partnerships, Grievances, Annex - Ratings Definitions
5241 Bosnia and Herzegovina SCCF Inception Report-Jan 2016-FINAL.docx Title: Inception Report, January 2016	Vulnerability of VRB municipalities, Project objective, outcomes and outputs, Activities preceding Project operationalization, Inception Workshop results, Description of Project organizational structure, Description of Implementation of Project activities, New development in stakeholders' coordination, Workplan. The Annex includes Inception workshop minutes, List of workshop participants, Budget revision, Technical Methodology. Terms of Reference for International Experts, Terms of Reference for Major Subcontracts, Updated Risk and Assumptions Table
PIMS 5241_SCCF_BH_UNDP_Prodoc 26 Feb final LPACed.doc Title: PROJECT DOCUMENT: Technology transfer for climate resilient flood management in Vrbas River Basin	Situation analysis, Project Strategy, the Project Results Framework, Total budget and workplan, Management Arrangements, Monitoring Framework and Evaluation, Legal Context.
PIR-2016-GEFID-PIMS5241.docx Title: 2016 Project Implementation Review, Nov 2017	Basic Project and Finance Data, Project Contacts and Links, Project Summary, Progress toward Development Objective , Annual Project Quality Assurance Assessment, Ratings and Comments on Project Progress, Project Planning , Critical Risk Management, Environmental and Social Grievances, Communicating Impact, Partnerships and Progress toward Gender Equality
Vrbas - PO 1 meeting - 16 10 2015 engl. Title: Minutes of the Project Board meeting, Oct 2015	Minutes of the Project Board meeting
Vrbas - PO 1. sastanak- 16.10. 2015.ppt engl. Title: Project board meeting presentation, Sep 2015	Project board meeting presentation
Vrbas - PO 2 meeting - 19 01 2016 engl. Title: Minutes of the 2nd Project Board meeting, Jan 2016	Minutes of the Project Board meeting

Vrbas - PO 2. sastanak- 19 01 2016.ppt engl. Title: Project board meeting presentation, Jan 2016	Project board meeting presentation
Vrbas - PO 3 meeting - 09 06 2016 engl. Title: Minutes of the 3rd Project Board meeting, Jun 2016	Minutes of the Project Board meeting
Vrbas - PO 3. sastanak- 09 06 2016.ppt engl. Title: Project board meeting presentation, Jun 2016	Project board meeting presentation
Vrbas - PO 4. sastanak - 23 09 2016 ENG Title: Minutes of the 4th meeting of the Project Board, Sep 2016	Minutes of the Project Board meeting
Vrbas - PO 4. sastanak- 23 09 2016.ppt engl. Title: Project board meeting presentation, Sep 2016	Project board meeting presentation
Vrbas - PO 5. sastanak - 20 02 2017 - final ENG Title: Minutes of the 5th meeting of the Project Board, Feb 2017	Minutes of the Project Board meeting
Vrbas - PO 5. sastanak- 20 02 2017.ppt engl. Title: Project board meeting presentation, Feb 2017	Project board meeting presentation
Vrbas - PO 6. meeting- 20 09 2017-eng Title: Minutes of the 6th meeting of the Project Board, Sep 2017	Minutes of the Project Board meeting
Vrbas - PO 6.meeting - 20 09 2017 - final ENG Title: Project board meeting presentation, Sep 2017	Project board meeting presentation
RE-SUBMISSION_PIF - Bosnia SCCF_PIF_22Jan2014.docx Title: Project Identification Form (PIF)	Detailed project description including indicative project description and financing as well as justification
FINAL VRBAS River Verification Mission May17.docx Title: REPORT Verification Mission Vrbas River (92036)	Post-facto assessment of the CO Projects' adherence to the basic UNDP rules and regulations and SOPs related to operations (with a special emphasis on the areas delegated to Projects), identification of potential managerial issues and best practices as well as further enhancement of the CO operations support to and cooperation with the projects. Rating: satisfactory
Project budget balance 20 Nov.pdf Title: Project Budget Balance	Detailed budget overview and utilization as of November 2017
CPD 2015-2019.pdf	Including project rationale, programme priorities and partnerships, programme risk

Title: Country programme document for Bosnia and Herzegovina (2015-2019)	management and monitoring and evaluation
CDR 2015 - FINAL.pdf CDR 2016.pdf CDR by Activity Jan Sept 2017 signed.pdf Title: Combined Delivery Report by Activity	Expenditure overview
RESUBMISSION_PIMS_5241_SCCF_BH_CC-A Tracking Tool_21-01-15.xls Title: Project Tracking Tool	Finalized GEF focal area Tracking Tools at CEO endorsement

6.8 Co-financing table (if not previously included in the body of the report) and co-financing letters



Co-financing report
MTR- UNDP.pdf



Co-financing report
- Water Agency Sava



Co-financing report
RS MAFW.pdf



Co-financing report
- Water Agency Sava



RS MAFW ENG.docx

6.9 Signed UNEG Code of Conduct form

Evaluators/Consultants:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

MTR Consultant Agreement Form

Agreement to abide by the Code of Conduct for Evaluation in the UN System:

Name of Consultant: Georg Petersen

Name of Consultancy Organization (where relevant): n/a

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at *Sarajevo* on 27. Nov 2017

Signature:



6.10 Signed MTR final report clearance form

To be completed by the Commissioning Unit and UNDP-GEF RTA and included in the final document

Midterm Review Report Reviewed and Cleared By:	
Commissioning Unit	
Name: Sanjin Avdic, EE Sector LEader	
Signature: 	Date: 28 Dec 2018
UNDP-GEF Regional Technical Advisor	
Name: Natalia Olofinskaya	
Signature: _____	Date: _____

6.11 Audit trail from received comments on draft MTR report

#	Comment/ Feedback on the draft MTR report	MTR response
1.	The report lacks any technical analysis of the evolution of the project context, project achievements and shortcomings, required changes.	The project runs pretty much according to plan, with no big shortcomings other than the identified agroforestry, FRM plan and flood insurance aspects. See additions in the report. There are anyhow no significant adjustments or changes required from the way project management is currently handling the project, other than pushing even harder to close the identified gaps. Technically the living with floods concept as opposed to the call for defences could be strengthened as described further below.
2.	Update on the project context: currently the context section in the MTE is based entirely on the text of the project document. It would have been useful to outline the changes in the project context since the launch of the project, new challenges or new partnership opportunities emerged since then (new regulations and policy documents, new partner projects, etc.).	The ToR is what the context of the project is based on. Paragraphss have been added in the document that further describe the challenges and required changes in the project context.
3.	Project achievements: a deeper technical analysis of the project achievements is required, a more detailed description and analysis of completed activities and results so far (beyond copy/paste from the PIR)	Where activities are finalized the same status as previously is reported, where implementation is ongoing, details have been added in the report.
4.	Project shortcomings: need to be analyzed and presented with the recommendations for remedial actions. E.g. work on insurance have not been developing as fast as was expected, agro-forestry measures are more expensive than anticipated, there is no political consensus on development of FRMP. The MTE could reflect those and provide recommendations for improvement/adjustment of the approach (e.g. expansion of insurance to the national level is feasible due to economy of scale). This is the main purpose of the MTE process. The project could still have HR rating.	included in narrative as well as recommendations table.
5.	Project risks: changes in the risks to the project implementation need to be analyzed, such as potential further delays with the implementation of a parallel WBIF project on risk mapping and IPA projects on development of flood risk management plans; O&M commitments by national beneficiaries of the hydromet equipment, slow buy in from insurance sector, etc.	The points have been addressed in the report.

6.	Formal compliance with the TORs: not all the formal requirements to the MTE reports as listed in the TORs have been completed (e.g. GEF evaluative matrix has not been filled)	Assuming this refers to the tracking tool, the revised version of the tracking tool has now been received and an evaluation included into the report.
7.	The evaluator didn't outreach RTA Ms. Natalya Olofinskaya for an interview with the evaluation team. Ms. Olofinskaya is looking forward to speaking with you.	An interview with Ms. Olofinskaya has been conducted and her comments considered in the report revision.
8.	Efficiency: analysis of expenditures vs budget, delivery, compliance with approved budgets, etc. is lacking.	A budget/expenditure review has been added to the report
9.	Co-financing: there should be confirmation of co-financing released/provided to the project to-date vs. the planned amount at the project approval. I am not sure this is the case.	The project manager, Ms. Raduska Cupac, has been requested to obtain written confirmation from the cofinancing entities to be added to the MTR report.
10.	Standard rating table needs to be included	This is included in Section 6.4
11.	Potential for replication and scaling up could be strengthened / expanded.	This has been strengthened in the report.
12.	Table with recommendations should be included.	The recommendation section has been revised and strengthened in table format

6.12 Relevant midterm tracking tools



PIMS 5241
Adaptation-tracking

Terminal Evaluation Report

UNDP-GEF Project: Technology transfer for climate resilient flood management in Vrbas River Basin

GEF Project ID: 5604

UNDP Project ID: 5241

Country:	Bosnia and Herzegovina
Region:	Europe and the CIS
GEF Focal Area:	Climate Change
Trust Fund:	Special Climate Change Fund (SCCF)
Implementing Partner / Executing Entity:	United Nations Development Programme (UNDP)
Other Partners Involved:	Ministry of Spatial Planning, Construction and Ecology of Republika Srpska; Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina

Date	Version	
23 December 2019	01	First draft
28 February 2020	02	Second draft
16 March 2020	03	Draft final

Opening Page

PROJECT DETAILS:

Project Name:	Technology transfer for climate resilient flood management in Vrbas River Basin	
Project ID:	GEF Project ID: 5604	UNDP PIMS ID: 5241
Country:	Bosnia and Herzegovina	
Region:	Europe and the CIS	
Focal Area:	Climate Change Adaptation	
Funding Source:	Special Climate Change Fund (SCCF)	
GEF Focal Area Objective:	CCA-3: Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology	
Implementing Partner / Executing Entity:	United Nations Development Programme	
Implementation Modality:	Direct Implementation Modality (DIM)	
Other Partners Involved:	Ministry of Spatial Planning, Construction and Ecology of Republika Srpska; Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina	

FINANCIALS:

Project Preparation Grant:	USD 150,000
GEF Project Grant:	USD 5,000,000
Cofinancing Total:	USD 77,260,000
GEF Agency Fees:	USD 475,000
Total Cost:	USD 82,410,000

PROJECT TIMELINE:

Received by GEF:	01 October 2013
Preparation Grant Approved:	05 February 2014
Concept Approved:	03 March 2014
Project Approved for Implementation:	09 February 2015
State Date:	24 March 2015
Project Closed (extended):	31 March 2020

TERMINAL EVALUATION DETAILS:

TE Timeframe:	September-December 2019
Terminal Evaluator	James Lenoci
Reporting Language:	English

The terminal evaluation (TE) Consultant would like to acknowledge the informative feedback and logistical support provided by the project stakeholders, including national, state and local government level partners, the Project Manager and project team members, the UNDP CO staff, the UNDP Regional Technical Advisor, Chief Technical Advisor, technical assistance consultants and service providers, and local beneficiaries of the delivered non-structural measures.

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Executive Summary

The project was approved under the GEF Special Climate Change Fund (SCCF) and implemented through a direct implementation modality, with UNDP as the implementing partner / executing entity. Basic project information and finances are summarized below in **Table 1**.

Table 1: Project summary table

Project Title: Technology transfer for climate resilient flood management in Vrbas River Basin		at endorsement (USD million)	at TE* (USD million)
GEF Project ID:	5604	GEF financing, PPG grant:	150,000
UNDP Project ID:	5241	GEF financing, project grant:	5,000,000
Country:	Bosnia and Herzegovina	IA own:	1,560,000
Region:	Europe and the CIS	Government:	75,700,000
Focal Area:	Climate Change	Other:	0
Focal Area Objective:	CCA-3, Special Climate Change Adaptation Fund (SCCF)	Total co-financing:	77,260,000
		Total Project Cost:	82,410,000
Implementing Partner / Executing Entity:	UNDP	Prodoc Signature (date project began):	24 Mar 2015
Other Partners Involved:	Ministry of Spatial Planning, Construction and Ecology of Republika Srpska; Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina	(Operational) Closing Date:	Proposed:
			Actual:
			31 Mar 2015
			31 Mar 2020

Note: Total expenditures based upon figures through 30 September 2019

PROJECT DESCRIPTION:

The "Technology transfer of climate resilient flood management in Vrbas River Basin" project is a 5-year, USD 5 million SCCF funded project with the overall objective to transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin (VRB). Adaptation technologies for climate resilient flood risk management (FRM) include the development of state-of-the-art hydrological and hydrodynamic models and GIS tools for the VRB incorporating climate change predictions and producing flood hazard maps as the basis for spatial planning and long-term strategic FRM. The project includes the upgrade and rehabilitation of the hydrometric network, the harmonization and centralization of the hydrometric database, and development of a flood forecasting system and enhanced early warning system within the VRB. Emergency response capacities have been enhanced through the development of emergency response plans and provision of training in flood-specific civil protection are provided. The project has worked closely with VRB municipalities in applying climate resilient community-based non-structural measures and has provided extensive training to local communities on climate resilient FRM approaches.

The project strategy includes the following three outcomes:

- Outcome 1: Key relevant development strategies/policies/legislation integrate climate change-resilient flood management approaches
- Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities
- Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in Vrbas River Basin

TERMINAL EVALUATION PURPOSE AND METHODOLOGY:

This terminal evaluation was conducted to provide conclusions and recommendations about the relevance, efficiency, effectiveness, sustainability, and progress towards impact of the project. The evaluation also aimed to identify lessons from the project for future similar undertakings, and to propose recommendations for ensuring the sustainability of the results. The evaluation was an evidence-based assessment and relied on feedback from persons who have been involved in the design, implementation, and supervision of the project, review of available documents and records, and findings made during field visits.

ADAPTATION BENEFITS GENERATED:

The project has successfully generated the following adaptation benefits:

Strengthened resilience and enhanced adaptive capacity in the Vrbas River Basin

The 638,600 ha Vrbas River Basin (VRB) is under improved management for climate resilience through development of a flood forecasting and early warning system (FFEWS), which included deployment and transfer of the following hydrometeorological equipment: twenty (20) precipitation stations, seven (7) hydrological stations and two (2) automatic meteorological stations; coordinated online data management and communication protocols; and is supported by a comprehensive, flood risk management (FRM) plan. Transfer of adaptation technology focused on the 13 municipalities (out of a total of 28 in the VRB) that are most susceptible to flooding; the cumulative number of inhabitants, project direct beneficiaries, in these 13 municipalities is 213,470, of which 52.2% are women.

Reduced flood vulnerability through implementation of non-structural measures

Vulnerability to floods have been reduced in eleven (11) municipalities through implementation of twenty (20) non-structural field interventions between August 2017 and November 2019, covering a cumulative reach of 22.55 kilometers and consisting of regulation of torrential streams, cleaning of riverbeds, strengthening of embankments, bolstering riverbank protection with stone embankments and gabion systems, constructing stormwater drainage systems and reinforcing riverbanks with vegetation, including under an agroforestry management system.

Increased coping capacity to flood events through strengthened civil protection systems

Coping capacities of entity (RS and FBiH), canton and municipality level civil protection units have been strengthened through technical training delivered to 571 CPU personnel and municipal officials, information disseminated to the public through radio, television, internet and print media, and transfer of the following communication and warning equipment: 140 portable radio stations delivered to the Federal Authority for Civil Protection FBiH (FUCZ), Republic Authority for Civil Protection of RS (RUCZ), Civil Protection of Central Bosna Canton, and 14 municipalities (Gradiška, Srbac, Laktaši, Čelinac, Kotor Varoš, Banja Luka, Knežev, Mrkonjić, Jezero, Šipovo, Jajce, Donji Vakuf, Bugojno and Gornji Vakuf-Uskoplje), 14 fixed radio stations, 14 mobile stations, 3 radio relays and 8 civil defense sirens.

Enhanced enabling environment through advances to legal framework and institutional strengthening

The enabling environment for flood risk management in the VRB and throughout BiH has been enhanced through advances in the legal framework and institutional strengthening, including amendments to the RS Law on Water which effectively transposes the EU Flood Directive (2017/60/EC), adoption of a RS decree stipulating requirements for FRM plans, adoption to amendments to the RS Law on Spatial Planning, development of eight (8) guidelines on various aspects of flood risk management, and extensive training delivered to regulatory and technical staff of ministries and agencies in FBiH and RS.

Reduced flood vulnerability through broadened collaboration and dialogue across entities and sectors

Vulnerability to floods has been reduced through improved and broadened collaboration and dialogue across entities and sectors, including developing a basin-wide flood forecasting and early warning system (FFEWS), strengthened cooperation among hydromet and water agencies in FBiH and RS, engagement with the hydropower (although further involvement is required) and agricultural sectors, and improved communication among municipalities in the VRB.

Strengthened resilience to climate change through knowledge generated among the professional community

Several professional service providers delivered technical assistance on the project, and the knowledge generated through these activities strengthens resilience to climate change, e.g., through development of flood risk management plan, flood risk and flood hazard maps, and flood forecasting tools, as well as information gained from real-time measurement of hydrometeorological data within the basin.

Strengthened resilience through preliminary development of natural disaster insurance

Climate resilience of communities has also been enhanced through preliminary development of natural disaster insurance, as a risk transfer instrument.

SUMMARY OF CONCLUSIONS:

The relevance of the project was substantiated in 2014 when extensive areas in BiH were devastated by record-setting flood events; the project concept was submitted in January of that year, before the flood events. The GEF funds have provided important incremental benefits to the flood risk management (FRM) efforts in BiH, specifically in the Vrbas River Basin (VRB). Shortly after the 2014 floods many donor partners and financial institutions disbursed technical and

financial assistance, including the European Investment Bank (EIB) which extended a EUR 55 million loan in 2014 for reconstruction of emergency flood protection structures in the Sava River Basin. The activities completed under the EIB loan comprised the largest proportion of cofinancing for the project. The GEF grant has funded a series of complementary non-structural measures, including development of flood forecasting and decision support systems, delivery of communication systems and strengthening flood warning systems, development of a participatory GIS-based flood risk management information system for the public and local governments, advanced planning for flood risks through overlaying flood risk and flood hazard maps to land use plans, assessment of socioeconomic vulnerabilities, constructing field interventions such as river channel cleaning and reinforcement of embankments to reduce vulnerabilities of at-risk communities, and preliminary development of natural disaster insurance primarily for residential stakeholders, as a risk transfer mechanism.

The project was aligned with Objective CCA-3 of the Programming Strategy for the GEF SCCF (2010-2014): “Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology”. The project remains relevant to the SCCF priorities, as the two subsequent SCCF programming strategies, for 2014-2018 and 2018-2022, contain similar technology transfer oriented objectives. The adaptation technology deployed and transferred on the project has provided flood management stakeholders with improved tools to make more informed and timely decisions, enabled more effective coordination across entities and enhanced knowledge of flood risks and hazards and the potential impacts of climate change.

Considering the primary objective of the project was technology transfer, there were commendable advances with respect to policy development, including transposing the EU Flood Directive in the RS. The VRB flood risk management (FRM) plan is another important achievement in terms of a policy tool and planning framework. The government of RS has approved the FRM plan, but the FBiH has elected to wait for the IPA II, EU-funded project to develop flood risk management plans countrywide. Although the VRB is considered an internal river in BiH, it extends across the RS and FBiH entities, and approvals of policies and management plans are handled separately at the entity level. This modality is an administrative reality that is factored into planning and decision making throughout BiH.

The project has contributed towards improved stakeholder involvement among the hydrometeorological institutes and water agencies in the two entities. The project strategy emphasized engagement with the agricultural and energy (hydropower) sectors, which are important stakeholders in the VRB and with respect to water resources management in general in the country. Several climate scenarios were modeled for the agricultural sector and extensive trainings were delivered to VRB extension officials and farmers on agricultural production in the floodplains of the VRB. And, hydropower sector stakeholders have been involved in the development communication protocols for improved flood risk management. The extent of engagement with the hydropower sector will need to increase as the protocols for the FFEWS are further developed and rolled out. As confirmed in the development of the FRM plan, the forestry sector is also an important stakeholder, e.g., due to forest loss in some of the upstream stretches in the VRB, discharges of some of the Vrbas River tributaries are on an increasing trajectory. In fact, the discharge from the Vrbanja Stream has been greater than the main channel of the Vrbas River on some occasions. Forest loss has also led to increased torrential flooding with significant sediment load in the flows due to exposed soils on steep slopes during intense rainfall events. The project made important contributions in the understanding and management of torrential floods, through torrent susceptibility modeling and development of torrent flood risk maps. Considering mountainous nature of many sections of river basins in BiH, these outputs are particularly valuable for flood risk management within the VRB and elsewhere in the country.

Regarding the risk transfer instruments included under Component 3, the project made substantive progress in assessing the local market conditions, surveying willingness to pay and evaluating viable products for BiH. The index-based products envisaged in the project strategy were determined unviable under current socioeconomic circumstances and more pertinent to the agricultural sector than for residential property, which was found to be the most appropriate segment to focus on. Based on experiences from a natural disaster insurance product introduced in Romania in 2008, a similar, mandatory product is proposed for BiH. The insurance sector, primarily in RS, has been actively engaged in the preparatory work facilitated under the project and remain committed to continue after project closure. Developing the requisite legal framework for the envisaged obligatory natural disaster insurance product will be a key step towards making genuine progress moving forward. The UNDP could provide an important and influential role in the process, bridging the governmental and private sectors and representing the needs of marginalized communities in at-risk areas.

The project has benefited from experienced and efficient project management and a strong project team. Financial delivery has exceeded 90% in each of the four full years reported from 2015 through 2018. Country ownership was found to be good, with high level representation on the project board from national, RS and FBiH stakeholders, and active involvement in the project activities. A total of USD 64.8 million of cofinancing has materialized by 24 December 2019; this is nearly 13 times the value of the USD 5 million GEF project grant. And, nearly USD 0.8 million of cash

cofinancing has been contributed by 11 VRB municipalities for 20 non-structural measures completed between August 2017 and September 2019; this figure will increase before project closure as there are a few interventions that will be completed before project closure in March 2020.

The potential for upscaling is high, including through the proposed USD 14 million GCF project “Scaling up climate resilient flood risk management in Bosnia and Herzegovina”, which is expected to be submitted for approval in the first half of 2020. Moreover, the EU remains the main donor in BiH and the EUR 5 million IPA II “Support to Flood Protection and Flood Risk Management” program, running from 2014-2020, includes development of countrywide flood risk management plans, which is the last step in fulfilling requirements stipulated in the EU Flood Directive. The FRM plan developed for the VRB provides valuable guidance for replication across other river basins, and the socioeconomic vulnerability assessment methodology developed on the project will be applied under the GCF project. Other evidence of replication during the project implementation period include adoption of the specifications for hydrometeorological stations for other river basins, including the Bosna River.

EVALUATION RATINGS:

Evaluation ratings are summarized below in **Table 2**.

Table 2: Evaluation ratings

Criteria	Rating	Comments
1. Monitoring and Evaluation (M&E)		
M&E Design	Satisfactory	The M&E plan was developed using the standard UNDP template for GEF-financed projects. The indicative M&E budget was USD 105,000, or 2.1% of the USD 5,000,000 GEF project grant – which is lower than the 5-7% range currently recommended for GEF-7 projects. M&E results were documented in project implementation review (PIR) reports. The project board was an important platform for M&E, providing strategic feedback to issues raised through project reporting and discussions during the board meetings. The project inception report provided a comprehensive and updated summary of the project and provided details regarding proposed project interventions. The project results framework was not critically reviewed at the inception phase, and there was confusion on what tracking tool to assess as the GEF made changes throughout the project implementation timeframe. The project team has responded to the midterm review recommendations, with some issues still under development, e.g., sustainability strategy.
M&E Implementation	Satisfactory	
2. Implementation and Execution		
Quality of Implementation and Execution	Satisfactory	<p>Drawing from long-standing operations in BiH and strong institutional capacity in leading CCA and human development projects and programs, UNDP as the GEF implementation agency and executing entity, has successfully led the project from conceptualization to project development and throughout implementation. Country ownership has been good throughout, with high level representation on the project board, including the Minister of the Ministry of Spatial Planning, Construction and Ecology of RS as chair of the board, and involvement by national, state and local government level stakeholders. Substantial cofinancing was delivered by recipient government partners, including approximately USD 0.8 million of direct cash contributions by 11 VRB municipalities.</p> <p>The project board convened regularly (twice per year generally) and provided constructive guidance and supervision. Key issues and critical risks were captured in project reporting and discussed at the board meetings.</p> <p>The UNDP CO provided administrative and strategic guidance throughout the project development and implementation phase. Apart from USD 1.5 million of parallel grant cofinancing, UNDP provided more than USD 60,000 of in-kind cofinancing, which includes a share of the salaries of CO staff and costs for office premises and services. The UNDP regional technical advisor (RTA) has also been actively involved, providing strategic guidance to the project team. Moreover, the international Chief Technical Advisor (CTA) provided high-level guidance throughout the project, starting at conceptualization and continuing through the development and implementation phases.</p>
3. Assessment of Outcomes		
Overall Quality of Project Outcomes	Highly Satisfactory	The GEF funding addressed the key barriers highlighted in the project design, and the project has managed to highly satisfactorily achieve the intended project outcomes within the allocated budget and 5-year implementation timeframe. The

Criteria	Rating	Comments
		level of outcomes achieved exceeded expectations, through the developed water information system, the torrents susceptibility modeling, LiDAR surveys and strengthened regulatory framework, which is particularly noteworthy.
Relevance	Highly Satisfactory	<p>The project was aligned with Objective CCA-3 of the Programming Strategy for the GEF SCCF for the period of 2010-2014: "Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology". The project remains relevant to the SCCF priorities of the two subsequent SCCF programming strategies for 2014-2018 and 2018-2022.</p> <p>The project strategy is consistent with the priorities outlined in the countrywide 2013 Climate Change Adaptation and Low Emissions Development Strategy for BiH covering the period 2013 to 2025, and with the Environmental Approximation Strategy (EAS), adopted in May 2017. Climate change risk in the development of agriculture in BiH is recognized in the Strategic Plan for Rural Development of BiH (2018-2021) – Framework Document. In terms of civil protection, the project interventions on strengthening capacities of civil protection units are in line with the preparations for BiH in becoming a participating state of the Union Civil Protection Mechanism (UCPM).</p> <p>The development objectives of the project were aligned with United Nations Development Assistance Framework (UNDAF) and the UNDP Country Programme Document (CPD) for Bosnia and Herzegovina for the period of 2015-2019, specifically UNDAF Outcome 5, "By 2019, legal and strategic frameworks are enhanced and operationalized to ensure sustainable management of natural, cultural and energy resources, and CPD Output 2 under this outcome, "Subnational actors implement climate change adaptation (CCA) and mitigation measures, sustainable energy access solutions, and manage natural resources sustainably; and with UNDAF Outcome 3, "By 2019, there is effective management of war remnants and strengthened prevention and responsiveness for man-made and natural disasters, and CPD Output 2 under this outcome, "Legal and policy frameworks in place supporting implementation of disaster and climate risk management measures, including gender perspective".</p>
Effectiveness	Satisfactory	Outcome 1: Key relevant development strategies, policies, legislation integrate climate change-resilient flood management approaches
		Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities
		Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in Vrbas River Basin
Efficiency	Highly Satisfactory	The project has been cost-effective in generating adaptation benefits in the VRB. Financial delivery has exceeded 90% in each of the four years from 2015 through 2018. Total materialized cofinancing is USD 64.8 million, which is 84% of the amount committed at project entry but 9X the value of the GEF project grant and includes nearly USD 0.8 million of direct cash cofinancing from VRB municipalities through September 2019.
4. Sustainability		
Overall likelihood that benefits will continue to be delivered after project closure	Moderately Likely	<p>The strengthened enabling environment achieved through the project interventions increases the likelihood that results will be sustained after GEF funding ceases. In fact, three of the four sustainability dimensions have been applied the highest rating of "likely". The overall likelihood that benefits generated on the project will be sustained after closure is rated as moderately likely, due to institutional framework and governance aspects.</p> <p>There is continued donor support for flood risk management, including long-standing funding from the EU and a GCF project that is expected to be submitted for approval in the first half of 2020. Transposing the EU Flood Directive in RS is a</p>

Criteria	Rating	Comments
Financial dimension	Likely	significant step towards institutionalizing flood risk management and sustained budgetary commitments. The flood risk management plan for the VRB provides an important guidance for VRB municipalities to allocate available resources and also provides a prioritized framework for domestic and international donors. The project facilitated improved coordination in the VRB among water sector stakeholders in FBiH and RS; however, the complex political and institutional arrangement in BiH diminish the likelihood for sustainability of project results. For instance, the VRB flood risk management plan was approved by the RS, but not by the FBiH.
Socioeconomic dimension	Likely	Effective flood risk management in the long-term will also require increased involvement by the energy (hydropower) and forestry sectors. In the FBiH, a proportion of the revenue collected from water tariffs is earmarked for the operation of hydrometeorological stations. Similar arrangements have been made in RS, through allocation of financing from the RS Fund for Environmental Protection and Energy Efficiency. Cash cofinancing contributions were delivered by the municipalities where non-structural measures were implemented; however, there are funding constraints among VRB local governments for sustaining regular maintenance of the completed non-structural measures, such as cleaning out stream channels and reinforcing embankments. Strengthened capacities of civil protection units enhance the likelihood that project results will be sustained. The project made substantive contributions towards the development of natural disaster insurance products and there is strong commitment among private sector insurance companies to carry on the process after project closure. Establishing the legal framework for the envisaged obligatory insurance product, however, will take time and sustained leadership by the governmental sector.
Institutional Framework and Governance dimension	Moderately Likely	
Environmental dimension	Likely	
5. Overall Project Results	Satisfactory	The project has achieved impressive results. The 638,600 ha VRB is under improved management for climate resilience through successful transfer of climate adaptation technology and advances to policy and regulatory frameworks. The strong emphasis on institutional strengthening has built an enhanced enabling environment for facilitating follow-up actions. The incremental benefits achieved through the GEF funding is confirmed through the replication that has occurred during the project implementation phase and the high potential and expected investments for upscaling.

RECOMMENDATIONS:

TE recommendations are presented below in **Table 3**.

Table 3: Recommendations table

No.	Recommendation	Responsible Entities	Timeframe
Corrective actions for the design, implementation, monitoring and evaluation of the project			
1.	Finalize and initiate the implementation of a sustainability plan. One of the recommendations of the midterm review was to develop a sustainability strategy. It would be advisable to complete an action plan according to the strategy and initiate implementation before project closure, e.g., identifying roles and responsibilities, indicating costs and possible sources of funding, recommending champions for follow-up actions, etc.	Project team, project board	Before project closure
2.	Carry out a terminal assessment using the CCA tracking tool for the SCCF programming period of 2018-2022. The suggested sections of the 2018-2022 CCA tracking tool that are relevant to the VRB project include: Core Indicators 1, 2, 3 and 4; Objective 1, Outcome 1.1, Output 1.1.1; and Objective 1, Outcome 1.1, Output 1.1.3.	Project team	Before project closure
3.	Prepare a factsheet on the proposed natural disaster insurance product. A concise and informative factsheet would provide documentary support in advocating for the further development of the insurance coverage.	Project team	Before project closure
4.	Liaise with the "EU 4 Civil Protection Project" regarding results achieved in strengthening capacities of civil protection units. It would be advisable to liaise with the EU 4 Civil Protection project, sharing lessons learned and approaches implemented, and explore possibilities for synergies with the proposed GCF project.	Project team	Before project closure
Actions to follow up or reinforce initial benefits from the project			
5.	Carry out stock-taking and update the FRM plan for the VRB. It would be advisable to carry out a stock-taking exercise of the VRB FRM plan in the next 1-2 years, and update the plan	FRM stakeholders	Within the next 1-2 years

No.	Recommendation	Responsible Entities	Timeframe
	according to any changed circumstances, e.g., completed structural and non-structural measures, and reevaluating the type and costs of short-term and long-term actions; reformulating “urgent” actions to “priority” actions; capturing the operationalized flood forecasting and early warning system; updating information regarding the hydropower sector within the basin; highlighting the importance of the forestry sector; etc.		
6.	Strengthen engagement with the hydropower and forestry sectors for integrated flood risk management. Hydropower and forestry are important sectors in the VRB and it is imperative to better engage these sectors regarding water regulation and land use practices.	FRM stakeholders	Within the next 1-2 years
7.	Develop the requisite legal framework and implement a public information campaign for the proposed natural disaster insurance coverage. In order to realize the envisaged obligatory insurance coverage, developing the requisite legal framework is essential and communicating the concept and coverage to the public should be prioritized.	Multi-stakeholder working group	Within the next 1-2 years
Proposals for future directions underlining main objectives			
8.	Integrate flood risk management with river basin management. Consistent with principles of the EU Flood Directive and the EU Water Framework Directive, flood risk management should be further integrated with river basin management, entailing closer coordination across administrative entities in BiH.	FRM stakeholders in BiH	Within the next 1-2 years
9.	Promote integration of flood risk management priorities into the National Energy and Climate Plan (NECP) for the period of 2021-2030 in order to align with EU energy and climate policies. BiH has recently started working on the NECP and, therefore, the timing is opportune to integrate FRM issues in the early phases in the development of the plan.	FRM stakeholders in BiH	Within the next 1-2 years
10.	Advocate for membership and participation in the Alliance for Hydromet Development¹, which brings together major international development, humanitarian and climate finance institutions, collectively committed to scale up and unite efforts to close the hydromet capacity gap by 2030.	Hydromet institutions, UNDP	Within the next 1-2 years

A few examples of good practices and lessons learned regarding project design and implementation are presented below.

GOOD PRACTICES:

Coordination with other projects increases the likelihood that project results will be sustained. The project has done a good job at coordinating with other projects and initiatives, addressing opportunities during each of the project board meetings and facilitating direct cofinancing contributions.

Cash cofinancing from VRB municipalities enhances country ownership and increases the likelihood that project results will be sustained. Substantial cash cofinancing has been contributed by 11 VRB municipalities for cost-sharing in the implementation of non-structural measures. This direct interaction with local governments significantly enhances the level of country ownership on the project and increases the likelihood that project results will be sustained after GEF funding ceases.

Rotating the project board meeting strengthens coordination and collaboration across entities. Considering the VRB extends across the RS and FBiH, rotating the venue of the project board meetings has been a good practice at strengthening coordination and collaboration among entity level stakeholders.

Involvement of the private sector in the conceptualization of natural disaster insurance increases the marketability of the product and contributes towards the objectives of risk transfer. The constructive feedback and interest from the private insurance sector stakeholders has been instrumental in conceptualizing a viable product that has market potential in BiH. In fact, it would have been advisable to have had more in-depth consultation with the insurance sector during the project preparation phase.

LESSONS LEARNED:

The stakeholder involvement plan did not include specific approaches for engagement with the energy (hydropower), agricultural and forestry sectors. The project strategy contains specific objectives regarding the energy (hydropower) and agriculture sector, e.g., integrating climate change considerations in the sector strategies and

¹ The Alliance was launched at the COP25 climate conference on 10 December 2019.

policies; however, the stakeholder involvement plan did not contain specific approaches on engaging with these sectors, or with forestry sector, which is also an important stakeholder group in the VRB and throughout BiH.

The aim of increasing resilience of highly exposed rural poor, returnee and displaced persons communities in the VRB was not clearly reflected in the evaluation criteria of non-structural measures approved for implementation. The project developed a comprehensive evaluation matrix for assessing offers for non-structural measures. Flood risk is included among the criteria in the evaluation matrix, but there is not a specific criterion on the risks to highly exposed rural poor, returnee and displaced communities in the VRB – which is the underlying objective of the project.

Gender mainstreaming targets were not fully integrated into the project results framework and not regularly reported on. A gender assessment was included in the project document, but a detailed gender analysis and action plan were not prepared during the project preparation phase, and the project strategy did not fully meet the criteria for a GEN 2 marker characterization. A gender mainstreaming indicator framework was included in the project document; however, it would have been advisable to integrate these gender indicators into the project results framework and to focus the gender metrics on empowerment and equality.

Cost-sharing at the project level. The USD 1.5 million in cash cofinancing from UNDP committed at CEO endorsement was integrated into the total budget and work plan as cost-sharing at the project level. The actual cofinancing that was reported was parallel contributions from complementary projects, which is not cost-sharing at the project level.

It would have been advisable to develop a knowledge management strategy. The project has made important contributions to knowledge associated with flood risk management in the VRB and BiH in general. It would have been advisable to develop a knowledge management strategy, describing roles and responsibilities, cofinancing contributions, ownership of knowledge platforms and systems after GEF funding ceases, etc.

Cofinancing allocations should extend beyond project closure to cover follow-up actions. Allocation of cofinancing contributions should extend beyond the date of project closure, e.g., by 2-3 years, to cover the cost and oversight for follow-up actions.

Abbreviations and Acronyms

Exchange Rate, BAM:USD: **1.80064** (24 Mar 2015, at project start); **1.75794** (20 Dec 2019, at terminal evaluation)

AFD	Agence Française de Développement
AWP	Annual Work Plan
BAM	Bosnia and Herzegovina Convertible Mark
BiH	Bosnia and Herzegovina
CB EWS	Community Based Early Warning System
CC	Climate Change
CCA	Climate Change Adaptation
CDR	Combined Delivery Report
CIS	Commonwealth of Independent States
CO	Country Office
CPD	Country Programme Document
CPU	Civil Protection Unit
CRFRM	Climate Resilient Flood Management
CTA	Chief Technical Advisor
DIM	Direct Implementation Modality
DRR	Disaster Risk Reduction
EAS	Environmental Approximation Strategy
EC	European Commission
EIB	European Investment Bank
EU	European Union
EWS	Early Warning System
FBiH	Federation of Bosnia and Herzegovina
FFEWS	Flood Forecasting and Early Warning System
FRM	Flood Risk Management
FUCZ	Federal Authority for Civil Protection FBiH
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF CCA	Global Environment Facility Climate Change Adaptation
GEF	Global Environment Facility
GEF OFP	Global Environment Facility Operational Focal Point
GIS	Geographic Information Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
ha	Hectare
INC	Initial National Communication
IPA	Instrument for Pre-Accession Assistance
LDCF	Least Developed Countries Fund
LiDAR	Light Detecting and Ranging
M&E	Monitoring and Evaluation
MoFTER	Ministry of Foreign Trade and Economic Relations
NAP	National Adaptation Plan
NDCs	Nationally Determined Contributions
NECP	National Energy and Climate Plan
NGOs	Non-Governmental Organizations
PAC	PAC Project Appraisal Committee
PGIS	Participatory Geographical Information Systems
PIF	Project Information Form

PIMS	Project Information Management System
PIR	Project Implementation Review
PPG	Project Preparation Grant
RCPO	Regional Chief Procurement Officer
RS	Republika Srpska
RUCZ	Republic Authority for Civil Protection of RS
RTA	Regional Technical Advisor
SBAA	Standard Basic Assistance Agreement
SCCF	Special Climate Change Fund
SDG	Sustainable Development Goal
SECO	Swiss Secretariat for Economic Affairs
SEEC CRIF	Southeast Europe and the Caucasus Catastrophe Risk Insurance Facility
SMART	Smart, Measurable, Achievable, Relevant and Timebound
SNC	Second National Communication
TE	Terminal Evaluation
TNC	Third National Communication
TOR	Terms of Reference
UCPM	Union Civil Protection Mechanism
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNEG	United Nations Evaluation Group
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
USD	United States Dollar
VRB	Vrbas River Basin
WB	World Bank
WBIF	Western Balkans Investment Framework
WFD	Water Framework Directive

1 Introduction

1.1 Purpose of Evaluation

The purpose of the terminal evaluation (TE) is to provide an impartial review of the project in terms of its relevance, effectiveness, efficiency, sustainability, progress towards impact and overall performance. The information, findings, lessons learned, and recommendations generated by the evaluation at this particular time will be used by the UNDP and the implementing partners to strengthen the remaining project implementation and inform prospects for eventual replication and sustainability of the intervention.

The objectives of the evaluation were to assess the achievement of project results, to draw lessons that can both improve the sustainability of benefits from this project and aid in the overall enhancement of UNDP programming. The broader purposes of evaluations of UNDP supported, GEF financed projects include the following:

- ✓ To promote accountability and transparency, and to assess and disclose the extent of project accomplishments
- ✓ To synthesize lessons that can help to improve the selection, design and implementation of future GEF financed UNDP activities
- ✓ To provide feedback on issues that are recurrent across the UNDP portfolio and need attention, and on improvements regarding previously identified issues
- ✓ To contribute to the overall assessment of results in achieving GEF strategic objectives aimed at global environmental benefit
- ✓ To gauge the extent of project convergence with other UN and UNDP priorities, including harmonization with other United Nations Development Assistance Framework (UNDAF) and UNDP Country Programme Document (CPD).

1.2 Evaluation Scope and Methodology

The overall approach and methodology of the evaluation follows the guidelines outlined in the following guidance documents:

- Guidelines for GEF Agencies in Conducting Terminal Evaluation for Full-sized Projects, Approved by the GEF IEO Director on 11th of April 2017
- UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects, 2012

The terminal evaluation was an evidence-based assessment, relying on feedback from persons who have been involved in the design, implementation, and supervision of the project, and review of available documents and findings made during field visits.

The evaluation included following activities:

- ✓ The one-week TE mission was completed over the period 4-8 November 2019. The mission itinerary is compiled in **Annex 1**.
- ✓ As a data collection and analysis guidance tool, the evaluation matrix included as **Annex 2** was used to guide the evaluation. Evidence gathered during the evaluation was cross-checked between as many sources as practicable, to validate the findings.
- ✓ The TE Consultant interviewed key project stakeholders, including the project manager, representatives from participating government agencies and ministries, consultants, local beneficiaries, as well the UNDP Country Office (CO) environment and energy sector manager, and the UNDP Regional Technical Advisor. A list of interviewed people is included in **Annex 3**.
- ✓ A desk review was made of available reports and other documents, listed in **Annex 4**. Certain documentary evidence, including maps showing the built out hydrometeorological network and a summary of completed non-structural measures is compiled in **Annex 5**.
- ✓ The project results framework was used as an evaluation tool, in assessing attainment of the project objective and outcomes against indicators (see **Annex 6**).
- ✓ The TE Consultant reviewed information regarding cofinancing realized throughout the duration of the project; the filled in cofinancing table is compiled in **Annex 7**.

The project was approved under the 2010-2014 SCCF Programming Strategy and the 2010-2014 version of the CCA tracking tool was assessed at CEO endorsement (baseline). The 2014-2018 version of the CCA tracking tool was considered for the midterm assessment.

Evidence gathered during the fact-finding phase of the evaluation was cross-checked between as many sources as practicable, to validate the findings.

Structure of the TE report:

The TE report starts out with a description of the project, indicating the duration, main stakeholders, and the immediate and development objectives. The findings of the evaluation are broken down into the following five sections:

- Assessment of Project Design
- Assessment of Project Results
- Assessment of Monitoring & Evaluation Systems
- Assessment of Implementation and Execution
- Other Assessments

The assessment of project design focuses on how clear and practicable the project's objectives and components were formulated, and whether project outcomes were designed according to SMART criteria:

- **S: Specific:** Outcomes must use change language, describing a specific future condition
- **M: Measurable:** Results, whether quantitative or qualitative, must have measurable indicators, making it possible to assess whether they were achieved or not
- **A: Achievable:** Results must be within the capacity of the partners to achieve
- **R: Relevant:** Results must make contributions to selected priorities of the national development framework
- **T: Time-bound:** Results are never open-ended. There should be an expected date of accomplishment.

The project design assessment covers whether capacities of the implementation partners were sufficiently considered when designing the project, and if partnership arrangements were identified and negotiated prior to project approval. An assessment of how assumptions and risks were considered in the development phase is also included.

In GEF terms, project results include direct project outputs, short- to medium-term outcomes, and longer-term impact, including global environmental benefits, replication efforts, and local effects. Project results were evaluated and rated according to effectiveness, relevance, efficiency, sustainability and progress towards impacts. Effectiveness refers to the extent to which the project objective and outcomes have been achieved or how likely it is to be achieved by project closure. The assessment of relevance looks at the extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time. Relevance also considers the extent to which the project is in line with GEF operational programs and strategic priorities under which the project was funded. Efficiency is a measure of the extent to which results have been delivered with the least costly resources possible; also called cost effectiveness or efficacy. The efficiency assessment also examines compliance with respect to the incremental cost concept, i.e., the GEF funds were allocated for activities not supported under baseline conditions, with the goal of generating global environmental benefits.

Assessment of the sustainability addresses the likelihood that project results will be sustained after GEF funding ceases, with respect to financial resources, institutional frameworks and governance, socioeconomic considerations and environmental factors. Progress towards impact is an assessment of the project theory of change, i.e., how project results will lead to long term impact, according to the assumptions made and estimated intermediate states.

The assessment of project monitoring & evaluation systems includes an evaluation of the appropriateness of the M&E plan, as well as a review of how the plan was implemented, e.g., compliance with progress and financial reporting requirements, how were adaptive measures taken in line with M&E findings, and management response to the recommendations from the midterm review.

The quality of project implementation and execution is evaluated and rated. This assessment considers whether there was adequate focus on results, looks at the level of support provided, quality of risk management, and the candor and realism represented in the annual reports.

Other assessments include the need for follow-up, materialization of cofinancing, environmental and social safeguards, gender concerns, and the effectiveness of partnerships and the degree of involvement of stakeholders.

The report concludes with a set of recommendations for reinforcing and following up on initial project benefits and a discussion of good practices and lessons learned which should be considered for development and implementation of other UNDP supported, GEF financed projects.

1.3 Ethics

The evaluation was conducted in accordance with the UNEG Ethical Guidelines for Evaluators, and the TE Consultant has signed the Evaluation Consultant Code of Conduct Agreement form (**Annex 8**).

1.4 Evaluation Ratings

The findings of the evaluation are compared against the targets set forth in the logical results framework and analyzed according to developments that occurred over the course of the project. The effectiveness and efficiency of project outcomes are rated according to the 6-point GEF scale, ranging from Highly Satisfactory (no shortcomings) to Highly Unsatisfactory (severe shortcomings). Monitoring & evaluation and execution of the implementing and executing agencies were also rated according to this scale. Relevance is evaluated to be either relevant or not relevant. Sustainability is rated according to a 4-point scale, ranging from Likely (negligible risks to the likelihood of continued benefits after the project ends) to Unlikely (severe risks that project outcomes will not be sustained). More detailed descriptions of the rating scales are compiled in **Annex 9**.

1.5 Audit Trail

As an “audit trail” of the evaluation process, review comments to the draft report will be compiled along with responses from the TE Consultant as an annex separate from the TE report. Relevant modifications to the report will be incorporated into the final version of the TE report.

1.6 Limitations

The evaluation was carried out over the period of September-December 2019; including preparatory activities, field mission, desk review, and completion of the evaluation report, according to the guidelines outlined in the Terms of Reference (**Annex 10**).

The project deliverables were available in English and Bosnian, with progress reports and work plans in English. Translations of documents requested by the TE Consultant were arranged by the project team, and an independent interpreter supported the TE Consultant in interviews held in Bosnian language.

Field visits were made to two municipalities where non-structural measures have been completed. Many of the non-structural measures consisted of similar types of interventions and the TE Consultant considers that the information obtained during the field visits is sufficiently representative of the project activities. Moreover, extensive documentary evidence of completed works was reviewed.

2 Project Description and Development Context

2.1 Project start and duration

Key project dates are listed below:

Preparation Grant Approved:	05 February 2014
Project approved for implementation by GEF Secretariat:	09 February 2015
Project start (project document signed by Government of BiH):	24 March 2015
Project inception workshop:	29 April 2015
Midterm review:	Nov 2017 – Jun 2018
Terminal evaluation	Sep – Dec 2019
Project completion (planned):	31 March 2020

The project preparation grant was approved in February 2014, and the project was approved for implementation by the GEF Secretariat one year later on 09 February 2015. The Government of BiH signed the project document shortly after this date, on 24 March 2015, which marks the official start of the project. The project inception workshop was held on 29 April 2015. The midterm review started in November 2017 and continued to June 2018, with the final report approved in October 2018. The project completion date is set at 31 March 2020, consistent with the original closure date, 60 months following the start date.

2.2 Problems that the project sought to address

The situation analysis outlined in the project document explains how the slow rate of the post-war economic recovery of Bosnia and Herzegovina has been compounded by the negative impacts of climate change on key sectors such as agriculture, energy (hydropower), the environment and, in particular, the frequency and magnitude of flood disasters, which have tripled in frequency in the last decade².

The project target area, the Vrbas River Basin (VRB), is located in the northwestern part of the country, covering an area of 6,386 km², which is 12.5% of the total land area of BiH. The upstream reaches, approximately 37% of the VRB is situated in FBiH and the downstream section, covering 63% of the basin occurs in RS. The Vrbas River is a right tributary of the Sava River, one of the largest tributaries of the Danube River.

An updated analysis sponsored by the World Bank on water resource management of the Vrbas River Basin³, which concluded that the problem of the seasonality of discharge in VRB has increased in recent years due to an increase in extreme discharge values and decrease in minimal discharges. The study also reports that in the last ten years, floods and droughts have occurred on a scale not previously recorded.

With flood risks exacerbated by the impacts of climate change, it is imperative that BiH implement adaptation technologies and approaches to minimize the exposure of people and economic assets. Three key barriers were identified as hindering efforts under the baseline scenario for developing and implementing risk based flood management in the VRB.

Barrier #1: A lack of a comprehensive legislative and policy framework for strategic water and flood risk management, to respond to climate change risks; Fragmentation and gaps in policies and national regulations for long-term flood risk management under climate change.

Barrier #2: Lack of institutional capacities, technologies, equipment, data and tools for hazard, vulnerability, damages and loss assessments on which climate resilient flood risk management can be based.

Barrier #3: Lack of community level resilience technologies and adaptive strategies to minimize flood impact, including lack of a comprehensive and unified flood forecasting, early warning and response system to increase community resilience.

² Climate Changes and Water Management in Bosnia and Herzegovina with Special Focus on Flood Protection, Igor Palandzic, Sarajevo 2012, <http://www.scribd.com/doc/112546672/KLIMATSKE-PROMJENE-I-VODNI-RESURSI-U-BOSNI-I-HERCEGOVINI-Climate-Changes-and-Water-Resources-in-Bosnia-and-Herzegovina>

³ Update the Basis of the Water Resources Management of the Vrbas River Basin, World Bank, February 2012

2.3 Immediate and development objectives of the project

The project aims to support and enhance the flood risk management systems, capacities and understanding of enabling stakeholders and vulnerable communities. As outlined in the project document, the most damaging floods in BiH have had devastating impacts on the most vulnerable groups including the rural poor, war returnees and displaced persons.

The project strategy explains how direct consequences of the flooding in the Vrbas basin are multiple and include: damages to the housing stock, damages of infrastructure and lower economic output, especially in agriculture. These negative consequences have impacts on the livelihoods of the individual households and people of the VRB. The adverse effects on livelihoods are manifested through (i) the increased expenditures for individual households on repairs of damaged houses, agricultural buildings/facilities and infrastructure, and (ii) reduced incomes and savings from their agricultural production; or indirectly through the (iii) reduced availability of funding for social protection and welfare at the municipal/cantonal level due to the need to redirect the already scarce public budgets to cover the priority repairs of social buildings and infrastructure. Loss of commercial revenues and disruptions to business continuity can also have a direct impact on local GDP and more directly on livelihoods.

The development objectives of the project were aligned with United Nations Development Assistance Framework (UNDAF) and the UNDP Country Programme Document (CPD) for Bosnia and Herzegovina for the period of 2015-2019, specifically UNDAF Outcome 5, "By 2019, legal and strategic frameworks are enhanced and operationalized to ensure sustainable management of natural, cultural and energy resources, and CPD Output 2 under this outcome, "Subnational actors implement climate change adaptation (CCA) and mitigation measures, sustainable energy access solutions, and manage natural resources sustainably.

The contributions towards strengthening disaster and climate risk management capacities are also consistent with UNDAF Outcome 3, "By 2019, there is effective management of war remnants and strengthened prevention and responsiveness for man-made and natural disasters, and CPD Output 2 under this outcome, "Legal and policy frameworks in place supporting implementation of disaster and climate risk management measures, including gender perspective".

2.4 Baseline indicators established

Baseline indicators established include:

- Limited institutional capacity and technologies in use for strategic FRM in BiH.
- Hydrometric stations cover 50% of the area required for FFEWS for VRB
- No policy/regulatory framework for adaptation related technology transfer in place
- Very few professionals are aware of adaptation technologies
- Most of the socio-economic information required to assess flood damages, losses, exposure and vulnerability is not currently available and is not collected systematically and gender-disaggregation of data not systematically done
- Approach to FRM is structural flood protection measures
- FFEWS system disjointed and not fully electronically based

2.5 Main stakeholders

The main stakeholders relevant to the project were described in the project document, as listed below in **Table 4**.

Table 4: Project stakeholders (outlined in project document)

Name of institutions /stakeholders consulted	Stakeholder interests, official position or mandate	Relevance to the Project / Reasons for inclusion	Modality of involvement
BiH Ministry of Foreign Trade and Economic Relations	State level Responsible for coordinating policies and measures in the field of the environment.	Location of GEF Operational Focal Point Coordination, advocating -Member of Project Board	Formal review of the Vrbas DRR project proposal Regular consultations, participation and active work in Vrbas DRR Project Board, Participation in preparation of sectoral policies and plans

Terminal Evaluation Report

Technology transfer for climate resilient flood management in Vrbas River Basin

GEF Project ID: 5604; UNDP PIMS: 5241

Name of institutions /stakeholders consulted	Stakeholder interests, official position or mandate	Relevance to the Project / Reasons for inclusion	Modality of involvement
RS Ministry of Spatial Planning, Construction, and Ecology	Entity level Responsible for environmental policies and measures in RS, including environmental measures that may mitigate CC. Responsible for integrative planning and spatial planning in RS. UNFCCC focal point.	UNFCCC focal point. Sectoral policies and plans will be updated in order to include CC modelling results- will be informed on project activities and results. -Member of Project Board	Formal review of the Vrbas DRR project proposal Regular consultations, participation and active work in Vrbas DRR Project Board, Participation in preparation of sectoral policies and plans
F BiH Ministry of Agriculture, Water-Management, and Forestry	Entity level Responsible for coordinating policies and measures in agriculture, water-management and forestry	Sectoral policies and plans will be updated in order to include CC modelling results- will be informed on project activities and results. -Member of Project Board	Formal review of the Vrbas DRR project proposal Regular consultations, participation and active work in Vrbas DRR Project Board, Participation in preparation of sectoral policies and plans
RS Ministry of Agriculture, Forestry, and Water Resources	Entity level Responsible for coordinating policies and measures in land use, forestry, and water resources	Sectoral policies and plans will be updated in order to include CC modelling results- will be informed on project activities and results. -Member of Project Board	Formal review of the Vrbas DRR project proposal Regular consultations, participation and active work in Vrbas DRR Project Board, Participation in preparation of sectoral policies and plans
Federal BiH Ministry of Environment and Tourism	Responsible for coordinating entity-level policies and measures in the environmental area (environmental conservation, preparation of environmental policies and strategies, monitoring of environmental factors)	Sectoral policies and plans will be updated in order to include CC modelling results- will be informed on project activities and results -Member of Project Board	Formal review of the Vrbas DRR project proposal Regular consultations, participation and active work in Vrbas DRR Project Board, Participation in preparation of sectoral policies and plans
Ministry of Security of BiH	State level. Responsible for implementation of international obligations and cooperation in matters relating to civil protection, coordination of activities of entity services for civil protection in BiH, and harmonization of their plans for cases of natural or other disasters striking BiH territories, as well as issuance of agenda for protection and rescue	State level coordination body for protection and rescue. Sectoral policies and plans will be updated in order to include CC modelling results- will be informed on project activities and results.	Participation in preparation of sectoral policies and plans, support to development coordination mechanisms for civil protection, support to preparation disaster preparedness and response plans, development of EWS
Sava River Basin Agency	Management of Sava river basin (within BiH), data collection and distribution, water monitoring (hydrology and quality), preparation of Water management plans and plans for prevention and reduction of harmful impacts (flood, drought , erosion), preparation of legislation and policies, projects implementation	Main management body of Sava river basin. Sectoral policies and plans will be updated, and hydrodynamic model will be improved in order to incorporate CC- will be informed on project activities and results	Data provider: responsible and accountable for technical inputs and providing data and analyses Participation in preparation of sectoral policies and plans
Public Institution Waters of Srpska	Management of water resources within RS Entity. Preparation of Water management plans and monitor their implementation	Main management body of RS water resources Sectoral policies and plans will be updated, and hydrodynamic model will be improved in order to incorporate CC- should be informed on project activities and results Institutional capacities will be strengthened on induced FRM, climate risk assessment, scenario based planning for water sector- should actively participate	Data provider: responsible and accountable for technical inputs and providing data and analyses Participation in preparation of sectoral policies and plans Beneficiary- raising institutional capacity
Hydro-meteorological Institute of RS	Entity body Collects climatic and hydrological data necessary for studying climate variability, for trend analysis, and for long-run modelling.	Climatic and hydrological data are essential to the Vrbas DRR Data provider	Data provider: responsible and accountable for technical inputs and providing data and analyses Beneficiary- raising institutional and technical capacity

Name of institutions /stakeholders consulted	Stakeholder interests, official position or mandate	Relevance to the Project / Reasons for inclusion	Modality of involvement
	Conducts modelling and participates in WMO research programs.		Review and inputs in the Vrbas DRR project proposal development process
Hydro-meteorological Institute of F BiH	Entity body Collects climatic data necessary for studying climate variability, for trend analysis, and for long-run modelling.	Climatic and hydrological data are essential to the Vrbas DRR Data provider	Data provider: responsible and accountable for technical inputs and providing data and analyses Beneficiary- raising institutional and technical capacity Review and inputs in the Vrbas DRR project proposal development process
Local Governments	Municipal bodies Management of public functions/ activities within local communities Preparation of development plans and programmes Organization and management of civil protection Spatial planning Local economic development	Local development plans and policies will influence the findings of the Vrbas DRR in order to incorporate CC- will be informed on project activities and results Develop local spatial plans Organize and manage civil protection at local level Data provider	Active participation in project implementation: nomination of reference group, participatory risk assessment, participation in development of climate resilient adaptive measures, nomination of nonstructural measures for implementation, cofinancing of nonstructural measures in their jurisdictions, development of integrated flood risk management plan, raise capacities, raise community awareness and preparedness Beneficiaries: raising institutional and technical capacity
NGOs (environmental, social inclusion and protection organizations-for returnees and displaced persons, vulnerable groups, minorities, etc.)	NGOs Provide information, training, and awareness-raising	Can serve as a resource for public outreach related to the Vrbas DRR and to raising awareness among the public about climate change-related issues, Involvement of the most vulnerable groups, returnees, displaced people, minorities.	Active participation in project implementation: Rising awareness, delivering of adaptation activities and capacity development, provide trainings
Smallholder farmers, returnees and displaced persons	Innovators, Responsible Parties	Beneficiaries. Responsible for identification and delivering of adaptation activities; as well as project beneficiaries	Beneficiaries. Active participation in project implementation: participate in development and delivering adaptation measures, awareness raising, participatory risk assessment, participate in development of land use and flood risk management plan, participate at trainings on implementation and maintenance of flood resilient non-structural intervention measures
Private sector / Micro agricultural businesses	Financial services provider	Delivering of adaptation activities	Active participation in project implementation: development and implementation of adaptation measures
Faculties of Natural Sciences/Agriculture (Banja Luka and Sarajevo)	Universities, research institutions	The highest educational institutions in the field of ecology, physics, chemistry and Agriculture Data and technical service provider	Participation of students/individual experts in data collection and analysis for purposes of: "land use and flood risk management plan", data base for loss and damage assessment

2.6 Project theory of change

The GEF alternative addresses the three key barriers identified in the situation analysis of the baseline scenario through three mutually supportive outcomes illustrated in the theory of change shown in **Figure 1** and listed below.

- Outcome 1: Key relevant development strategies/policies/legislation integrate climate change-resilient flood management approaches;
- Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities; and
- Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in Vrbas River Basin.

A more detailed theory of change, analyzed at the output level, formed the basis of the interventions and activities included in the project strategy.

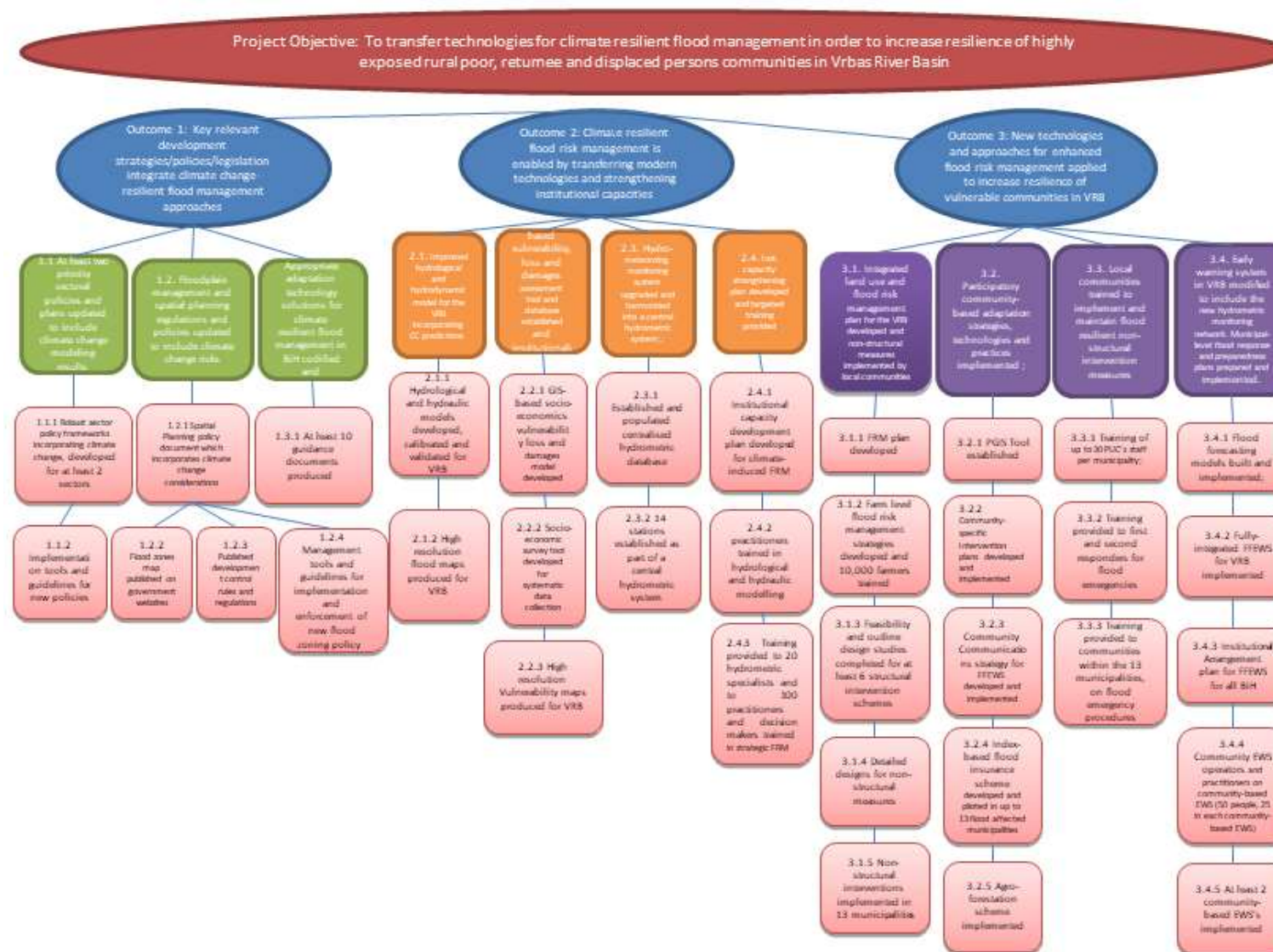


Figure 1: Project theory of change

3 Assessment of Project Design

3.1 Analysis of project results framework

The project was approved under the GEF Special Climate Change Fund (SCCF) and aligned to Objective CCA-3, “Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology”, Outcome 3.1, “Successful demonstration, deployment and transfer of relevant adaptation technology in targeted areas” and Outcome 3.2, “Enhanced enabling environment to support adaptation-related technology transfer”, (see **Table 5**), under the Revised Programming Strategy on Adaptation to Climate Change (GEF/LDCF.SCCF.9/4/Rev.1, October 19, 2010).

Table 5: SCCF outcomes and core outputs, 2010-2014 Programming Strategy

Expected outcomes and indicators	Core outputs and indicators
Objective CCA -3 - Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology	
Outcome 3.1: Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas Indicator 3.1.1 % of targeted groups adopting transferred adaptation technologies by technology type, disaggregated by gender (Score)	Output 3.1.1: Relevant adaptation technology transferred to targeted groups Indicator 3.1.1.1 Type and No. of adaptation technologies transferred to targeted groups (Type and No.) Indicator 3.1.1.2 Type and No. of adaptation technologies transferred from targeted areas (Type and No.)
Outcome 3.2: Enhanced enabling environment to support adaptation-related technology transfer Indicator 3.2.1 Policy environment and regulatory framework for adaptation-related technology transfer established or strengthened (Score) Indicator 3.2.2 Strengthened capacity to transfer appropriate adaptation technologies, disaggregated by gender (Score)	Output 3.2.1: Skills increased for relevant individuals in transfer of adaptation technology Indicator 3.2.1.1 Type and No. of relevant policies and frameworks developed or strengthened (Type and No.) Indicator 3.2.1.2 No. of individuals trained in adaptation-related technologies (Number)

The three project components were designed to be mutually supportive:

Component 1: Enabling environment for climate risk sensitive water and flood management

Component 2: Technology and institutional capacity for transferring climate resilient flood management technologies and approaches

Component 3: Climate resilient flood management technologies for vulnerable communities in VRB

The project document contains a comprehensive situation analysis and description of baseline conditions in the VRB. Considerable guidance was provided in the project document in terms of hydrometeorological requirements and needs for flood mitigation measures in the basin.

As part of this terminal evaluation, the project results framework for the project was assessed against “SMART” criteria, to evaluate whether the indicators and targets were sufficiently specific, measurable, achievable, relevant, and time-bound. With respect to the time-bound criterion, all targets are assumed compliant, as they are set as end-of-project performance metrics.

The project results framework was found to be largely SMART-compliant, apart from a few issues discussed below.

Project Objective:

There are two indicators at the project objective level, with the first indicator taken from the GEF CCA tracking tool (SCCF 2010-2014 version) regarding the number and type of adaptation technologies transferred, and the second objective level indicator based on increased coverage of automatic hydrometric stations for improved flood forecasting and early warning. The SMART analysis of the objective level section of the project results framework is presented below in **Table 6**.

Table 6: SMART analysis of project results framework (project objective)

Indicator	Baseline	End-of-Project target	MTR SMART analysis				
			S	M	A	R	T
Objective: To transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin							
1. Number of new technologies transferred to BiH as part of a methodology for strategic FRM.	Limited institutional capacity and	At least 5 new technologies introduced (hydrological and hydrodynamic modelling, state-of-the-art monitoring equipment, Flood	Y	Y	Y	Y	Y

Indicator	Baseline	End-of-Project target	MTR SMART analysis				
			S	M	A	R	T
AMAT indicator 3.1.1.1 Type of adaptation technologies transferred to the target groups	technologies in use for strategic FRM in BiH	forecasting and early warning systems, flood damages and losses modelling and vulnerability assessment, and a number of non-structural flood management technologies to BiH)					
2. VRB (12% of BiH territory) covered by an automated hydrometric monitoring network for effective Flood Forecasting and Early Warning	Hydrometric stations currently cover 50% of the area required for FFEWS for VRB	The VRB (i.e.12% of BiH) covered by a Hydrometric network that provides the optimal coverage required for FFEWS	Y	Y	Y	Y	Y
SMART: Specific, Measurable, Achievable, Relevant, Time-Bound Green: SMART criteria compliant; Yellow: observation noted regarding SMART criteria; Red: not compliant with SMART criteria							

The definition of “optimal coverage”, stated in the end target for Indicator No. 2 regarding the hydrometric network in the VRB, is unclear. Different stakeholders likely have differing viewpoints regarding what is required to reach optimal coverage.

It would have been advisable to include a metric at the objective level on the number of direct beneficiaries from the improved climate information systems deployed to reduce climatic hazards/variability.

Outcome 1:

The first of the two indicators (Indicator No. 3) under Outcome 1 is a measure of improvements to the policy and regulatory framework related to adaptation related technology transfer, and the second indicator (Indicator No. 4) reflects the enabling environment for uptake of adaptation technological solutions. The SMART analysis of Outcome 1 indicators included in the project results framework is presented below in **Table 7**.

Table 7: SMART analysis of project results framework (Outcome 1)

Indicator	Baseline	End-of-Project target	MTR SMART analysis				
			S	M	A	R	T
Outcome 1: Key relevant development strategies/policies/legislations integrate climate change resilient flood management approaches							
3. AMAT Indicator 3.2.1 Policy environment and regulatory framework for adaptation related technology transfer established or transferred	1: No policy/regulatory framework for adaptation related technology transfer in place	4: Policy/regulatory framework for adaptation related technology transfer have been formally adopted by the Government but have no enforcement mechanisms	Y	Y	Y	Y	Y
4. No. of Adaptation technology solutions for climate resilient flood management (CRFRM) enabled for implementation	0: Document codifying standard methodologies and procedures for Climate resilient flood Risk Management (CRFRM)	At least 10 guidance documents produced on Climate Resilient Flood Risk Management topics	Y	Y	Y	Y	Y
SMART: Specific, Measurable, Achievable, Relevant, Time-Bound Green: SMART criteria compliant; Yellow: observation noted regarding SMART criteria; Red: not compliant with SMART criteria							

Indicator No. 3 is taken from the GEF CCA tracking tool (SCCF 2010-2014 version) and is a measure of policy and regulatory frameworks for adaptation related technology transfer, whereas the phrasing of the outcome represents a broader policy framework on integrating climate change resilient flood management approaches.

The end target for Indicator No. 4 is more appropriate at the output level, i.e., the number of guidance documents produced, and is not a particularly relevant metric of how development strategies, policies or legislations integrate climate change resilient flood management approaches.

Outcome 2:

Indicator No. 5, the first of two indicators under Outcome 2, is taken from the GEF CCA tracking tool (SCCF 2010-2014 version) and is a measure of institutional capacity. Indicator No. 6 is also a reflection of institutional capacity, specifically the number of institutions enabled for updating risk management strategies in response to vulnerability assessments and hydrometric monitoring results. The SMART analysis of the Outcome 2 indicators included in the project results framework is presented below in **Table 8**.

Table 8: SMART analysis of project results framework (Outcome 2)

Indicator	Baseline	End-of-Project target	MTR SMART analysis				
			S	M	A	R	T
Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities							
5. AMAT Indicator 3.2.2: Strengthened Capacity to transfer appropriate adaptation technologies	1: Very few professionals are aware of adaptation technologies	3: High Capacity achieved (>75%). Provision of models, information systems, tools and training in the use of these to professionals, on various aspects of climate adaptation technologies	Y	Y	Y	Y	Y
6. No. of institutions enabled to modify risk management strategies based on introduced vulnerability, loss and damages assessment and improved hydrometric monitoring technologies	Most of the socio-economic information required to assess flood damages, losses, exposure and vulnerability is not currently available and is not collected systematically and gender-disaggregation of data not systematically done.	GIS-based flood damages, losses and vulnerability assessment tool developed for VRB and systematic socio-economic survey methods established and implemented for VRB and introduces sex-disaggregated data collection protocols and methods	Y	Y	Y	Y	Y
SMART: Specific, Measurable, Achievable, Relevant, Time-Bound Green: SMART criteria compliant; Yellow: observation noted regarding SMART criteria; Red: not compliant with SMART criteria							

The end target for Indicator No. 5 is derived from the drop-down list in the tracking tool, regarding institutional capacity. The target of 75% (high capacity) is rather arbitrary and, therefore, the measurability of the achievement realized depends largely on how the results are assessed and by whom.

With respect to Indicator No. 6, the indicator is a measure of the number of institutions enabled to modify risk management strategies; however, the end target does not provide a number of institutions.

Outcome 3

There are three indicators under Outcome 3, which focuses on strengthening the resilience of vulnerable communities in the VRB through applying new flood risk management technologies and approaches.

Table 9: SMART analysis of project results framework (Outcome 3)

Indicator	Baseline	End-of-Project target	MTR SMART analysis				
			S	M	A	R	T
Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in VRB							
7. No. of people in target basin benefitting from FRM adaptation technologies, tools, and adaptation strategies, and are less exposed to flood risk	Current approach limited of inclusion of local communities, and particularly the vulnerable groups	At least 5 technologies transferred to 13 communities in community-based adaptation measures	Y	Y	Y	Y	Y
8. No. of innovative Non-structural measures introduced and implemented as part of climate adaptation strategies to provide improved resilience to communities (include agric.)	Current approach to FRM is structural flood protection measures	Non-structural measures designed and implemented in 13 municipalities by 2020	Y	Y	Y	Y	Y
		At least 4,200 hectares of agric. land protected by non-structural measures (e.g. floodplain agro-forestry to be implemented on at least 840 hectares)	Y	Y	Y	Y	Y
9. No. of communities benefitting from introduced forecasting, early warning, response and recovery technologies to support local communities at risk of flooding	FFEWS system currently disjointed and not fully electronically based	Fully integrated Flood forecasting and Early warning system implemented in VRB	Y	Y	Y	Y	Y
SMART: Specific, Measurable, Achievable, Relevant, Time-Bound Green: SMART criteria compliant; Yellow: observation noted regarding SMART criteria; Red: not compliant with SMART criteria							

Indicator No. 7 is a measure of the number of people in the basin benefitting from flood risk management technologies and approaches, whereas the end target states the number of communities. One of the approaches implemented for reducing vulnerabilities in at-risk communities was non-structural measures, which is reflected in Indicator No. 8. There is a lack of emphasis on vulnerable communities, e.g., highly exposed rural poor, returnee and displaced persons, in the metric established for the first sub-target for Indicator No. 8. As outlined in the description of the GEF alternative in the project document, the second sub-target for Indicator No. 8 is based on protecting 20% (840 ha) of the area of agricultural land damaged between 2004 and 2014 (4,200 ha). Agricultural land is clearly one of the types of land use at risk to flooding in the VRB, but the overall risks to property and life are based on a number of factors. In fact, the

selection of the non-structural measures implemented was based on several criteria, including flood risk, preparedness, co-financing, etc.

Indicator No. 9 is a measure of the number of communities benefitting from flood forecasting and early warning systems as well as other non-structural measures; however, the end target does not state a number of communities, rather the entire VRB is referred to.

3.2 Assumptions and risks

Twenty (20) project risks were identified in the project document, along with the potential consequence of each risk, prioritization of risk (low, medium and high) and proposed mitigation measures. Among the identified twenty risks, three were characterized as high priority, twelve as medium priority and five as low priority. The three high priority risks are listed below:

- Failure to reach agreement on new policy frameworks.
- Unforeseen delays in undertaking essential surveys due to weather/access issues etc.
- Adverse climatic conditions may also pose risks to workforce health and safety, or damage adaptation measures being implemented.

The first risk listed above, regarding the possible failure to reach agreement on new policy frameworks, did materialize during project implementation. The FRM plan developed for the RS section of the VRB; the FBiH stakeholders decided to wait for the IPA II EU-funded project, which will facilitate development of countrywide FRM plans. The proposed mitigation measures in response to this risk included ensuring the inter-agency working group has the right composition of stakeholders and also to ensure the Project Board was inclusive of key stakeholders.

The other two high priority risks did not materialize, but remain relevant for subsequent interventions.

Two additional high priority risks were introduced during the inception phase, both related to issues associated with data availability:

- Failure to identify key data sets. Delays in collecting essential data for the project. Risk of essential data not being available or to the quality or accuracy needed.
- Delays in availability of historical data, survey data leading to delays in starting the technical studies and modelling. Insufficient data and/or data of poor quality available to undertake sufficiently detailed and accurate modelling to support feasibility and design studies. Model not suitably detailed and accurate to undertake feasibility studies.

The project spent considerable time on gathering data, but the flood forecasting models and FRM plan were completed without prohibitive delays with respect to data availability.

Compliance with UNDP social and environmental safeguard policies was addressed in the project document; however, social and environmental risks were not assessed and characterized in terms of potential impact and probability of occurrence.

3.3 Lessons learned and linkages with other projects

The project was designed to build upon the general awareness-raising activities for key decision-makers and other trainings delivered by the disaster risk reduction (DRR) Initiative in BiH, including through adding climate risk management and flood risk management sessions in the trainings provided by the DRR project.

Potential linkages with other projects were described in the project design. The EUR 55 million loan from the European Investment Bank (EIB) for “Emergency Relief and Preventions Project”, is the largest value complementary intervention on flood management in the VRB and the largest cofinancing partner on the project. The EIB project, with an original timeframe of 2012-2017, included construction of hard engineering structures to safeguard agricultural, industrial and housing areas prone to flood impacts. The subject GEF-financed VRB project is adding value to the EIB loan interventions by facilitating climate resilient flood management strategic planning.

There has been significant technical and financial assistance disbursed by the European Union, including the Instrument for Pre-Accession Assistance (IPA) project “Support to Water Policy in BiH”, which was initiated in 2009 to support the Government of BiH in fulfilling the requirements under the EU Flood Directive (2007/60/EC), including carrying out preliminary flood risk assessments, developing flood hazard and risk maps, and preparing flood risk management plans. The IPA project has been implemented over a few phases, the flood hazard and risk maps for the country are expected

to be completed during the first half of 2020 and preparation of national level flood risk management plans is slated to start in June 2020.

The Western Balkans Investment Framework (WBIF) is another EU driven initiative, specifically a regional blending facility supporting EU enlargement and socioeconomic development in BiH, Albania, Kosovo⁴, Montenegro, North Macedonia and Serbia. The WBIF was established as a joint initiative of the European Commission, the Council of European Development Bank, the European Bank for Reconstruction and Development, the EIB and several bilateral donors. The World Bank Group, the KfW and the Agence Française de Développement (AFD) subsequently joined the framework. The WBIF funded Drina River Basin project has similar objectives and activities to the VRB project and implemented over a similar timeframe.

The USD 47 million World Bank funded irrigation development project is also listed as a complementary initiative in the project area. This World Bank project, which was started in 2012 and scheduled to close in March 2020, is focused on restoring or improving drainage, including rehabilitation with some construction, reconstruction, upgrading and modernization (only for the public/main and semi-public/secondary parts of the irrigation system, hence not on-farm), and also the introduction of new technologies that promote water use efficiency such as drip irrigation and low-pressure sprinklers. There is also a component on delivering support for the capacity strengthening of the Ministries and Water Agencies in RS and FBiH, and participating municipalities and cantons in addressing: the new sector policies, and establishing and strengthening Water User Associations (WUAs).

The project document also included mention of the World Bank, jointly with the UNISDR and the Swiss Secretariat for Economic Affairs (SECO), planning to address the problem of low catastrophe and weather risk insurance penetration in Southeastern Europe through the creation of the regional Catastrophe Risk Insurance Facility (SEEC CRIF), which has been recently incorporated as "Europa Reinsurance Facility Ltd" (Europa Re).

3.4 Planned stakeholder participation

Planned stakeholder participation was outlined in the Stakeholder Involvement Plan in the project document. The plan summarized the stakeholder consultations carried out during the project preparation phase and outlined the general approach for stakeholder involvement during project implementation. Some of the planned stakeholder involvement approaches included, but not limited to the following:

- Establishing an inter-agency working group for facilitating review and development of FRM policies and guidelines.
- Engaging with municipality officials on land use planning and designation of flood hazard zones.
- Consulting with relevant stakeholders on structural and non-structural flood management options.
- Undertaking community surveys to help characterize the socioeconomic conditions in the basin and better understand potential flood risks.
- Designing and implementing a public-facing website for disseminating information to the public.

Annex 5 to the project document contains a stakeholder involvement plan in tabular form, including a list of the key stakeholders, their interests or mandate, relevance to the project and modality of involvement. The types of involvement included formal review of the project proposal, participation on the project board, participation in preparation of sectoral policies and plans, provision of data, beneficiary in terms of strengthening institutional capacity, active participation in project implementation, etc.

There were a few shortcomings in the stakeholder involvement plan, including the lack of clearly articulated approaches and identification of key stakeholders in the agricultural, forestry and energy (hydropower) sectors.

3.5 Replication approach

The potential for replication was incorporated into the project design. By focusing on a complete river basin, the Vrbas River Basin, the approaches regarding flood risk management and the technologies and tools applied can be replicated in other river basins in the country. The river basin approach is fully consistent with the EU Water Framework Directive and the EU Flood Directive, both of which are transposed to varying degrees among the BiH governing entities.

⁴ This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence

Production of guidance documents on climate resilient flood risk management approaches under Component 1 of the project not only benefits the enabling stakeholders in the VRB but also provide practical information for replication in other river basins.

Proactive engagement with key water management sector stakeholders is another way in which the project design and implementation promoted replication. Stakeholder involvement included membership on the project board, direct involvement in the execution of project outputs and participation in trainings, workshops and other capacity building activities.

3.6 UNDP comparative advantage

The UNDP comparative advantage as the GEF agency was based on their extensive experience working in BIH, long-standing resident operations, their favorable standing among national stakeholders, and their institutional expertise in supporting CCA and disaster risk reduction projects. UNDP has delivered extensive and continuous in-country support to the BIH government and other partners in strengthening institutional and individual capacities and the multitude of aspects centered on human development, including gender and social inclusion.

The UNDP has provided technical assistance to the Government of BIH in the preparation and submittal of the INC and SNC to the UNFCCC, and has supported the government in preparing the Climate Change Adaptation and Low Emission Development Strategy. Moreover, the UNDP CO has successfully implemented water management projects in BIH and maintains a well-developed network among key institutional and civil society stakeholders in the water and climate change sectors.

The programme team at the UNDP Country Office has in-house specialists to support the project, and senior management in the CO provides resident strategic guidance. And, one of the four UNDP regional offices is located in the VRB. The UNDP Regional Technical Advisor based in Istanbul provides high level advisory services, e.g., through sharing best practices and lessons learned from the large portfolio of GEF projects supported by UNDP.

3.7 Management arrangements

The project was designed under a direct implementation modality (DIM), a modality that has been supported and agreed by governments at all levels (state and entity) and is in line with the Standard Basic Assistance Agreement (SBAA, 1995) between the UNDP and the Government of BIH. Considering the complexity of BIH's administrative arrangements, which includes two self-governing entities and multi-layered administrative procedures, the 2015-2019 United Nations Development Assistance Framework (UNDAF) stipulates that GEF-financed projects be implemented. The management arrangements are illustrated in the project organization structure copied below in **Figure 2**.

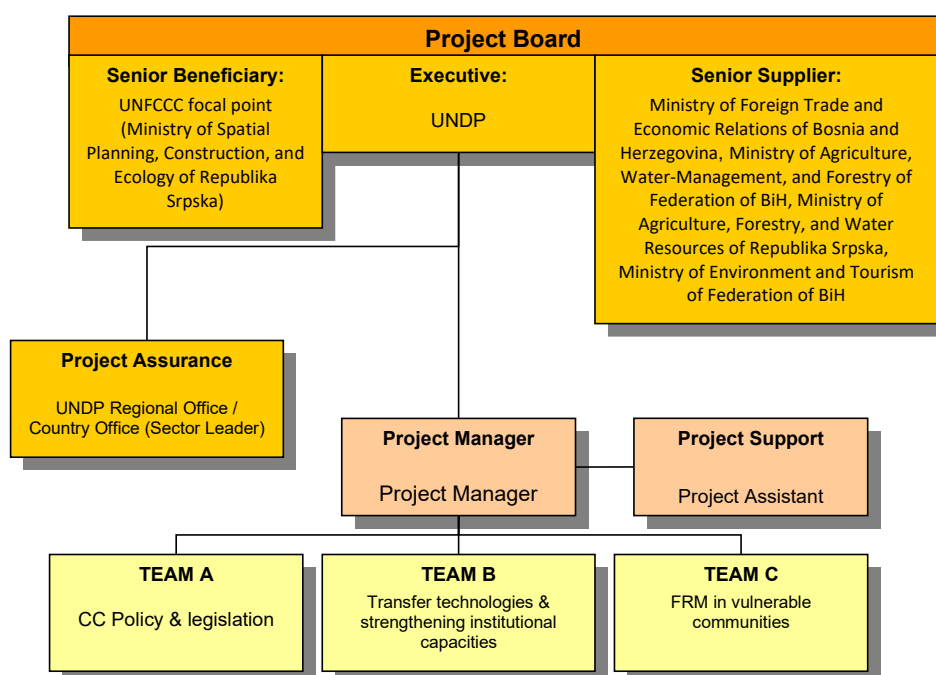


Figure 2: Project Organization Structure⁵

⁵ Copied from the project document.

The project board is chaired by the UNFCCC focal point, the RS Ministry of Spatial Planning, Construction, and Ecology of Republika Srpska. Other members of the board include the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina, the Ministry of Agriculture, Water-Management, and Forestry of Federation of BiH, the Ministry of Agriculture, Forestry, and Water Resources of Republika Srpska, and the Ministry of Environment and Tourism of Federation of BiH.

The day-to-day management of the project is carried out by a Project Manager under the overall guidance of the project board. The core project team consists of project manager and administrative assistant, supported by senior chief technical advisor and project officers who divide their responsibilities among specified three main areas of work.

4 Assessment of Project Results

4.1 Outputs

COMPONENT 1: ENABLING ENVIRONMENT FOR CLIMATE RISK SENSITIVE WATER AND FLOOD MANAGEMENT

Outcome 1: Key relevant development strategies/policies/legislation integrate climate change-resilient flood management approaches

Output 1.1: At least two priority sectoral policies and plans (agriculture and hydropower) updated to include climate change modeling results

Key Achievements:

- Amendments to the Law on Waters (Republika Srpska), transposing EU flood directive have been adopted.
- Decree containing content and elements of flood risk management has been developed and adopted (RS Government Decree).
- Amendments to the Law on Spatial Planning to include flood maps and climate changes have been adopted (RS Government).
- Draft flood zoning policy, which includes flood zoning rules, has been developed.

Issues/Challenges:

- The policy related advances facilitated through the project were primarily in the Republika Srpska (RS). Legislative reviews were made for both entities, but the results delivered for RS were more substantive than for FBiH.
- The two sectors highlighted in the project design were agriculture and energy (hydropower). Extensive climate scenarios were assessed for the agricultural sector, technical guidelines and training delivered for agricultural stakeholders; however, sector level policies for agriculture and hydropower were not realized.

Output 1.2: Floodplain management and spatial planning regulations and policies updated to include climate change risks (revision of land use regulations, stricter policy on construction permits in the areas prone to flooding, etc.)

Key Achievements:

- Flood hazard and risk maps with associated building codes have been prepared and made public, available to citizens of the VRB municipalities.
- Methodologies developed for torrents cadaster and susceptibility model.

Output 1.3: Appropriate adaptation technology solutions for climate resilient flood management in BiH codified and disseminated

Key Achievements:

- The project has reported the development of the following guidance documents
 1. Flood risk modelling and mapping methodology has been developed and adopted by local institutions.
 2. Guidance for the development of a centralized flood forecasting and early warning system.
 3. Operational and maintenance plan for hydrometric stations.
 4. Guidance to use of the participatory GIS-based platform (PGIS) and geoportal.

5. Methodology for socio-economic survey to assess and quantify the value of property at the level of settlements within municipalities.
6. Guidance to develop flood depth/damage curve and loss/damage model.
7. Guidance documents for integration of flood risk and spatial plans at local level.
8. Draft guidance for the development of a community-based early warning system.
9. Report on future climate scenarios for the Vrbas River basin.
10. Methodology on socioeconomic vulnerability and risk assessment

Issues/Challenges:

- Some of the envisaged guidance documents listed in the project strategy have not been prepared, including:
 - A comprehensive report on future climate scenarios for the Vrbas River basin was prepared. The report does not specifically provide an assessment of climate change impacts on different sectors, at the basin scale and incorporation of CC impacts into sector policies.
 - Guidance for undertaking field surveys for river topographic surveys, river flow surveys, and landslide surveys. This was determined unnecessary, as there was best practice guidance in place.⁶

COMPONENT 2: TECHNICAL AND INSTITUTIONAL CAPACITY FOR TRANSFERRING CLIMATE RESILIENT FLOOD MANAGEMENT TECHNOLOGIES AND APPROACHES

Outcome 2: Climate resilient flood risk management enabled by transferring modern technologies and strengthening institutional capacities

Output 2.1: Improved hydrological and hydrodynamic model for the VRB incorporating climate change predictions developed to produce flood hazard inundation maps for spatial planning and emergency response planning, and for the long-term strategic flood risk management of the VRB

Key Achievements:

- Hydrological and hydrodynamics models (including 2D model for the whole basin) have been completed. Climate scenarios included in the hydrological modelling.
- Data for flood mapping and flood forecasting were reconciled through data digitalization, interpolation, verification, desk analysis and extensive ground-truthing in gathering existing and verification of historical data.

Output 2.2: GIS-based vulnerability, loss and damages assessment tool and database established and institutionalized to record, analyze, predict and assess hydro-meteorological and other hazard events and associated losses

Key Achievements:

- A GIS-based loss/damage model, based on flood depth /damage curve, has been developed for housing and business sectors. Damages have been estimated for each return periods (20, 100 and 500 year).
- GIS based loss/damage models for agriculture has also been completed. This model is more complex than the one for housing and business sectors, as factors such as flood duration and flood seasonality are also integrated in order to assess the damage level for different crops.

Output 2.3: Hydro-meteorological monitoring system in the VRB upgraded (increased from 11 to 25 gauging stations) and harmonized into a central hydrometric system

Key Achievements:

- Deployment and transfer of the following hydrometeorological equipment: twenty (20) precipitation stations, seven (7) hydrological stations and two (2) automatic meteorological stations (a list of the stations is presented below **Table 10**; and maps showing locations of the stations are compiled in **Annex 5**).

⁶ Information provided by the CTA in the comments to the draft version of the TE report.

Table 10: Hydrometeorological stations purchased with VRB project funds

Location	Latitude	Longitude
Precipitation stations:		
Managed by the RS Hydromet:		
Šipovo	44°17'3.15"N	17° 5'15.92"E
Banja Luka PMF	44°46'44.66"N	17°11'56.34"E
Krupa na Vrbasu	44°36'54.48"N	17° 8'38.16"E
Majevac	44°14'24.86"N	17° 1'33.89"E
Manjača	44°39'47.64"N	17° 0'20.32"E
Kotor Varoš	44°36'34.36"N	17°23'19.13"E
Mrkonjić Grad	44°24'40.14"N	17° 5'0.63"E
Srbac	45° 6'10.42"N	17°30'52.49"E
Kneževo	44°31'27.30"N	17°19'5.81"E
Čelinac	44°44'1.59"N	17°20'50.32"E
Managed by the FBiH Hydromet:		
Šeherdžik	44°12'30.77"	17°25'7.11"
Rovna	44° 5'52.54"	17°29'24.72"
Rat	44° 2'39.17"N	17°41'13.85"E
Gračanica	44° 0'7.18"N	17°29'42.71"E
Kupres	43°59'23.04"N	17°16'34.26"E
Voljice - Gaj	43°55'7.52"N	17°32'3.29"E
Pidriš	43°53'31.57"N	17°35'0.82"E
Borova Ravan	43°51'22.04"N	17°40'59.15"E
Divičani	44°21'44.98"N	17°19'39.86"E
Dobroštin	43°53'49.07"N	17°38'8.56"E
Hydrological station		
Managed by RS Hydromet:		
Delibašino selo	44°48'2.20"N	17°13'32.20"E
Volari	44°17'31.75"N	17° 6'54.90"E
Bočac	44°34'13.30"N	17° 7'57.46"E
Majevac	44°14'20.62"N	17° 1'29.05"E
Sarići	44°16'28.54"N	17° 5'23.27"E
Donji Obodnik	44°33'31.62"N	17°28'37.01"E
Klašnice	44°52'48.95"N	17°17'5.70"E
Automatic Meteorological station		
Managed by the RS Hydromet:		
Banja Luka	44°47'37.79"N	17°12'20.77"E
Managed by the FBiH Hydromet:		
Gornji Vakuf-Uskoplje	43°56'13.58"N	17°34'48.35"E

- A photograph of the automatic meteorological station at the RS hydromet institute is shown in **Figure 3**.



Figure 3: Automatic meteorological station, RS Hydromet, 05 Nov 2019

- Training delivered to hydrometric specialists in RS and FBiH on the use, operation and maintenance, and coordination and communication across agencies and entities.
- The project funded 4 years of maintenance of the expanded hydrometric network; there has been generally uninterrupted operation during this period, as shown below in **Figure 4**.

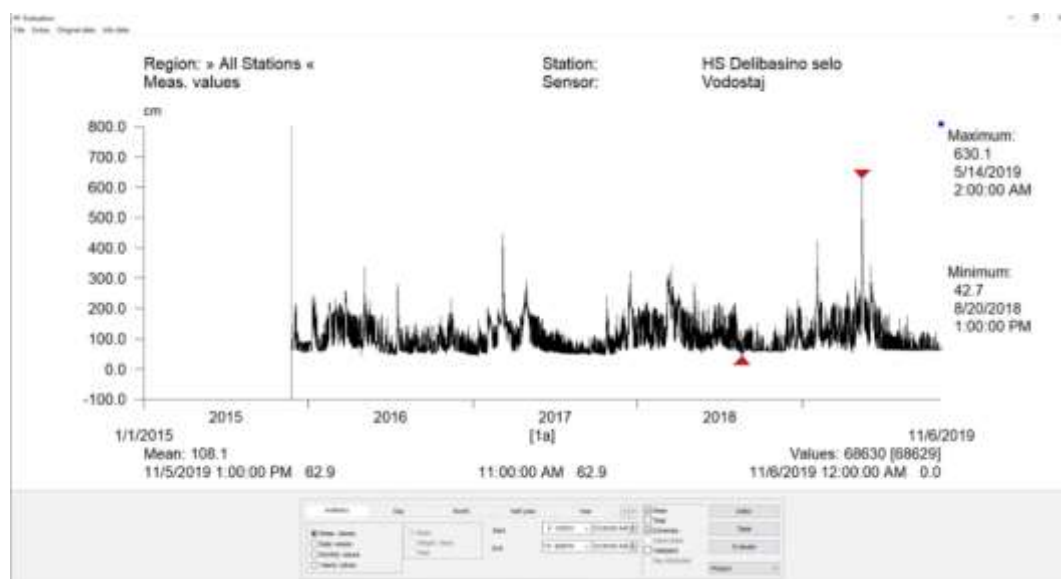


Figure 4: Mean values measured from all hydrological stations, RS Hydromet, 2015-2019⁷

Issues/Challenges:

- In the FBiH, a proportion of the revenue collected from water tariffs is earmarked for the operation of hydrometeorological stations. At the time of the TE mission in November 2019, these financing arrangements were not fully sorted out in RS. Over the timeframe of November 2019 and February 2020, arrangements have been made to finance the operation and maintenance of the hydromet network through allocations from the RS Fund for Environmental Protection and Energy Efficiency⁸.

⁷ Source: RS Hydromet Institute, Nov 2019

⁸ This information was shared by the project team in the review of the draft TE report.

Output 2.4: Institutional capacity strengthening plan developed and targeted training on climate -induced flood risk management provided to at least 100 relevant practitioners and decision makers (e.g. in Water agencies)

Key Achievements:

- The project has reported that more than 150 professionals have been trained in data management, use of water information system, hydrological and hydraulic modelling, torrents modelling, types of non-structural flood protection options and flood forecasting.
- Training of water agency professional staff were trained in the management of the upgraded Water Information System (<https://isvportal.voda.ba/>).

Issues/Challenges:

- The sustained management of the Water Information System will require committed funding from water agencies and regularly updated training delivered to responsible technicians.

COMPONENT 3: CLIMATE RESILIENT FLOOD MANAGEMENT TECHNOLOGIES FOR VULNERABLE COMMUNITIES IN VRB

Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in VRB

Output 3.1: Integrated land use and flood risk management plan for the VRB developed and non-structural measures implemented by local communities (through Output 3.2.), government and/or private sector

Key Achievements:

- Four (4) trainings were delivered and 130 trainers from agricultural extension services and 133 farmers were trained on climate change impacts on agricultural land degradation and decrease in crop yields and measures which can be taken in agricultural practice to mitigate flood risks.
- Through open procurement announcements, 20 non-structural measures completed in 11 VRB municipalities between August 2017 and November 2019 (see **Table 11**). Interventions included regulation of torrential streams, cleaning of riverbeds, strengthening of embankments, bolstering riverbank protection with stone embankments and gabion systems, constructing stormwater drainage systems and reinforcing riverbanks with vegetation, including under an agroforestry management system.

Table 11: List of completed non-structural measures, Aug 2017 - Nov 2019

Municipality	Length of intervention* (m)	Total cost (USD)	GEF funds (USD)
Banja Luka	950	93,555	42,418
Banja Luka	1,100	60,010	25,919
Bugojno	3,000	158,607	104,077
Kotor Varoš	150	81,798	56,888
Laktasi	850	127,362	83,550
Gornji Vakuf-Uskoplje	300	59,078	40,329
Knezevo	1,000	16,047	9,078
Laktasi	950	30,530	23,289
Laktasi	850	30,405	20,562
Srbac	1,000	38,761	26,872
Banja Luka	800	445,431	284,717
Laktaši	862	73,909	32,999
Kotor Varoš	130	52,991	35,941
Gornji Vakuf-Uskoplje	420	74,853	48,118
Čelinac	725	22,880	16,288
Srbac	1,850	39,189	30,039
Jajce	415	95,962	63,887
Mrkonjić Grad	315	47,885	17,789
Gradiška	1,488	611,745	348,144
Srbac	5,400	43,750	25,136
	22,555	2,204,748	1,336,042

* See further details in **Annex 5** to this TE report.

- A photograph of one of the non-structural measures, completed in Laktasi Municipality is shown below in **Figure 5**.



Figure 5: Stone-reinforced embankment on Vrbas River, Laktasi, 05 Nov 2019

- The locations of the municipalities where the non-structural measures have been completed are shown on the aerial photograph in **Figure 6** below.



Figure 6: Locations of municipalities where non-structural measures completed

- A comprehensive flood risk management (FRM) plan has developed for the RS section of the VRB.

- An index-based insurance product was conceptualized in the project strategy as a risk transfer mechanism. The project implementation team facilitated an in-depth analysis of market conditions, carried out a willingness to pay survey, and evaluated lessons from other countries having similar socioeconomic conditions. Based on roundtable discussions and consultations with private insurance sector stakeholders, a mandatory natural disaster insurance product for residential properties was determined to be the most viable approach in BiH, similar to a product that was issued in Romania in 2008. One of the reasons of considering a mandatory insurance product is that the premium would be affordable. The recommended annual premium for BAM 30,000 (approximately USD 17,000) of coverage would be BAM 30 (roughly USD 17).

Issues/Challenges:

- There are funding constraints among VRB local governments for sustaining regular maintenance of the completed non-structural measures, such as cleaning out stream channels and reinforcing embankments.
- FBiH governmental stakeholders decided to wait on developing the FRM plan for the FBiH section of the VRB until countrywide FRM plans are developed under the IPA II project.
- The costed action plan in the FRM plan is broken down into urgent (BAM 92 million), short-term (BAM 35.6 million) and long-term (BAM 35 million) actions. It would be advisable to rephrase or reconsider the “urgent” actions to “priority” measures, carry out a stock taking of circumstances after 1-2 years after project closure and update the FRM plan accordingly.
- The project has spent considerable time exploring possibilities for implementing agroforestry management systems as part of the non-structural measures; this was one of the options indicated in the project strategy. Agroforestry is not commonly practiced in the VRB and the options considered were generally very costly. A viable option was reached in late 2019, on municipality owned agricultural land. The integrated nonstructural measure included planting trees along a 5,400 m stretch of riparian area and cleaning and regulating 3,300 m of watercourses. The total area covered is approximately 1,325 ha.
- In order to make genuine progress towards introducing a mandatory natural disaster insurance product in BiH, the legal framework needs to be developed.

Output 3.2: Participatory community-based adaptation strategies, technologies and practices implemented in priority flood risk areas

Key Achievements:

- A participatory GIS platform (PGIS) was developed for sharing community-based flood risk management and early warning system functions to VRB municipalities. Extensive trainings were delivered to municipality staff. A screenshot of the PGIS is shown below in **Figure 7**.

The screenshot displays the PGIS VRBAS web application interface. At the top, there's a header with the title 'PGIS VRBAS' and logos for UNDP, GEF, and the project. Below the header, there are navigation tabs for 'Novi prijava (15)', 'Verifikovane prijava (2)', 'Nedovršene prijava (1)', and 'Uputstva'. A secondary set of tabs includes 'Komentirane prijava (1)', 'Novi komentari', 'Ustavljeno', 'Raspisi (1)', and 'Administracija'. The main content area features a table with columns for 'ID', 'Poto', 'ID', 'Opis', 'Naziv', 'Kategorija', 'Opis', 'Datum', 'Status', 'Mapa', 'Uredi', and 'Komentar'. The table lists several flood risk management actions, such as 'Potrebno čišćenje oko samopodiznog premosta iznad puta E761, ulica od 196', 'Potrebno čišćenje propusta od kanala', 'Potrebno čišćenje kanala prije odvođa', 'Korisno potoka potrebno čišćenje', 'Otklanjanje na šetniskom dijelu', 'Vodostaj: Gornje Oke, Zaprto u šurje i travu. Smrčeno 23.06.2017 u 12:25h', 'Vodostaj: šetnja i travu i šurje', 'Ispod Pota', and 'Populacija potoka vjenjak 40 šurje koje je ne održava i zanemaruje u travu. Smrčeno 06.07.2017 u 09:40h'.

Figure 7: Screenshot of Participatory GIS platform (PGIS)

- Flood intervention plans have been developed for 13 municipalities in the VRB. The plans include flood risk and flood hazard maps, evacuation protocols with routes and muster areas, and emergency communication and awareness procedures.

Issues/Challenges:

- The PGIS requires regular updating and maintenance, and the flood intervention plans should be updated regularly to reflect any changed circumstances, lessons learned, etc.

Output 3.3: Local communities (particularly women and refugees) trained to implement and maintain flood resilient non-structural intervention measures, including agricultural practices such as agro-forestry, to improve livelihoods of 13 communities in the VRB, and community-based flood early warning systems

Key Achievements:

- A Community Based Early Warning System (CB EWS) has been introduced in three pilot municipalities: Celinac, Bugojno and Kotor Varos. Criteria for selection of these municipalities were: a) local situation: streams and torrents with local flooding effect, but not covered by FFEWS (full FFEWS is covering Vrbas and two main tributaries: Pliva and Vrbanja) and b) strong interest and commitment of the local community. Additional equipment i.e. staff gauges have been purchased and installed at locations where water levels are easily monitored. And local water monitoring plans were developed.
- The project procured emergency response and communication equipment and delivered training to 14 VRB municipalities, the Bosna Canton, and the FBiH and RS civil protection authorities (see **Table 12**).

Table 12: Equipment delivered to Civil Protection Units

Municipality/Institution		Siren/pcs.	Mobile radio stations/pcs.		Portable radio station/pcs.
FUCZ (Federal authority for civil protection, FBiH)			Car mobile station	Fixed radio station	10
RUCZ (Republic authority for civil protection of RS)		Radio relay 2 pcs (location: Mrakovica 1pcs., Lisina 1pcs.)	-	-	20
SBK CZ (Civil protection of Central Bosna Canton)		Radio relay 1 pcs (location: Gornji Vakuf-Uskoplje)	-	-	5
1.	Gradiška	-	-	1	5
2.	Srbac	1	1	1	10
3.	Laktaši	2	1	1	10
4.	Čelinac	2	2	1	10
5.	Kotor Varoš	1	1	1	5
6.	Banjaluka	-	2	1	5
7.	Kneževo	-	1	1	5
8.	Mrkonjić Grad	-	1	1	5
9.	Jezero	-	-	1	5
10.	Šipovo	-	1	1	5
11.	Jajce	1	1	1	10
12.	Donji Vakuf	-	1	1	10
13.	Bugojno	1	1	1	10
14.	Gornji Vakuf-Uskoplje	-	1	1	10
TOTAL:		8	14	14	140

- The locations of the municipalities where civil protection units were strengthened are shown on the aerial photograph shown below in **Figure 8**.
- Sirens were also installed at hydropower plants and linked to the FE EWS; the hydropower plants provided cofinancing for these units.

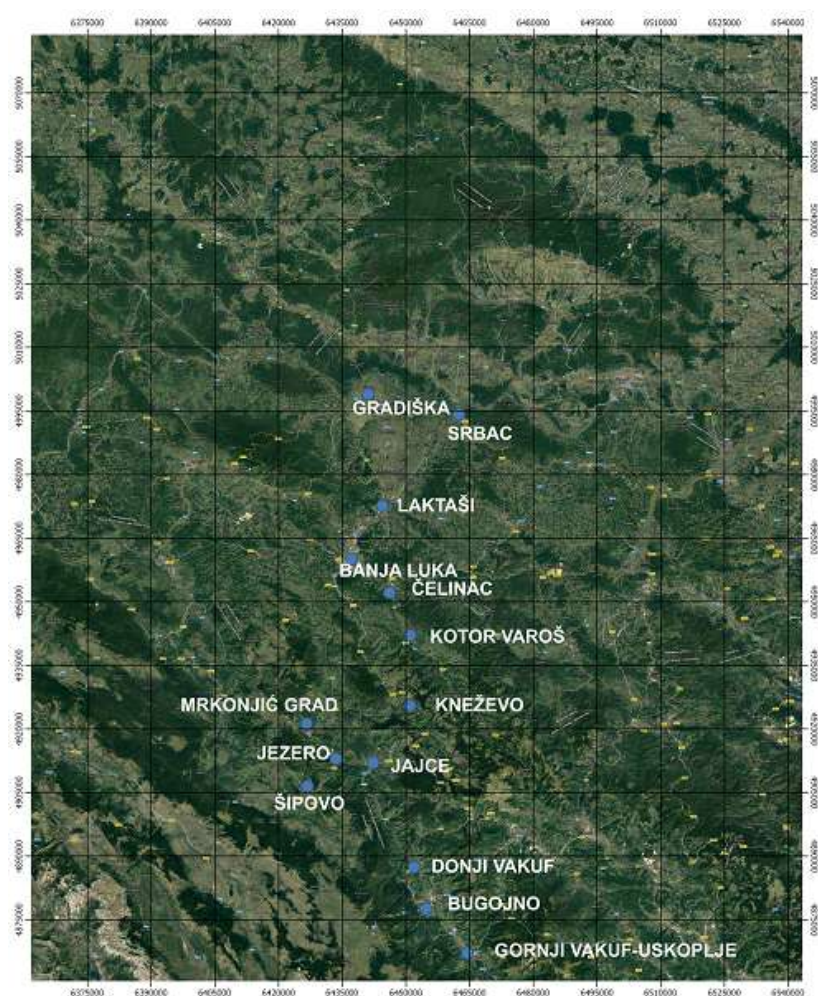


Figure 8: Locations of municipalities where civil protection units were strengthened

Issues/Challenges:

- Local champions are important stakeholders in ensuring community based early warning systems and civil protection units are sustained and expanded to other municipalities in the VRB.

Output 3.4: Early warning system in VRB modified to include the new hydrometric monitoring network as part of a fully-integrated flood forecasting system (comprised of centrally-based and community-based early warning systems). Municipal-level flood response and preparedness plans prepared and implemented.

Key Achievements:

- The project facilitated the establishment of the first flood forecasting and early warning system (FFEWS) in BiH. The platform for the FFEWS has been placed in the RS and FBiH water agencies and will be operationalized following the testing phase being implemented during the second half of 2019.
- The FFEWS for the VRB provides a valuable prototype for other basins to replicate across BiH.

Issues/Challenges:

- It will be important that involvement of the energy (hydropower) sector is sustained in the VRB, including coordination across the RS and FBiH entities.

4.2 Outcomes

4.2.1 Effectiveness

Effectiveness was evaluated by assessing achievement of the project objective and outcomes according to the agreed performance metrics included in the project results framework. A self-assessment made by the project team of achievement towards achievement of end targets of objective and outcome level indicators is compiled in **Annex 6** to this TE report, and TE assessments and ratings are summarized below.

Objective: To transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin

Achievement of the project objective is rated as: Satisfactory

The rating of satisfactory for the project objective is supported by the successful achievement of the two objective-level indicators, as presented below.

Indicator No. 1: Number of new technologies transferred to BiH as part of a methodology for strategic FRM (AMAT indicator 3.1.1.1 Type of adaptation technologies transferred to the target groups)				
	Baseline	End Target	Status at TE	TE Assessment
Value:	Limited institutional capacity and technologies in use for strategic FRM in BiH	At least 5 new technologies introduced (hydrological and hydrodynamic modelling, state-of-the-art monitoring equipment, Flood forecasting and early warning systems, flood damages and losses modelling and vulnerability assessment, and a number of non-structural flood management technologies to BiH)	The project has successfully achieved the end target of introducing at least 5 new technologies for strategic flood risk management.	Achieved
Date:	2013	Mar 2020	Nov 2019	
Indicator No. 2: VRB (12% of BiH territory) covered by an automated hydrometric monitoring network for effective Flood Forecasting and Early Warning				
	Baseline	End Target	Status at TE	TE Assessment
Value:	Hydrometric stations currently cover 50% of the area required for FFEWS for VRB	The VRB (i.e.12% of BiH) covered by a Hydrometric network that provides the optimal coverage required for FFEWS	The VRB hydrometric network has been expanded and the hydromet institutes in the two entities FBiH and RS are coordinating in data transfer and flood risk communication.	Achieved
Date:	2013	Mar 2020	Nov 2019	

Outcome 1: Key relevant development strategies/policies/legislations integrate climate change resilient flood management approaches

Achievement of Outcome 1 is rated as: Satisfactory

Achievement of Outcome 1 is rated as satisfactory. The project made substantive contributions towards strengthening the policy and regulatory frameworks associated with flood risk management, albeit primarily in RS.

Indicator No. 3: AMAT Indicator 3.2.1 Policy environment and regulatory framework for adaptation related technology transfer established or strengthened				
	Baseline	End Target	Status at TE	TE Assessment
Value:	1: No policy/regulatory framework for adaptation related technology transfer in place	4: Policy/regulatory framework for adaptation related technology transfer have been formally adopted by the Government but have no enforcement mechanisms	The project has facilitated substantive advances in policy and regulatory frameworks, primarily in RS. Further progress expected under the ongoing EU-funded flood risk management program and the GCF project currently under development.	Mostly Achieved
Date:	2013	Mar 2020	Nov 2019	
Indicator No. 4: No. of Adaptation technology solutions for climate resilient flood management (CRFRM) enabled for implementation				
	Baseline	End Target	Status at TE	TE Assessment
Value:	0: Document codifying standard methodologies and procedures for Climate	At least 10 guidance documents produced on Climate Resilient Flood Risk Management topics	The end target has been achieved, with guidance documents disseminated and institutionalized (e.g., flood forecasting and early warning system).	Achieved

	resilient flood Risk Management (CRFRM)			
Date:	2013	Mar 2020	Nov 2019	

Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities

Achievement of Outcome 2 is rated as: Highly Satisfactory

Achievement of Outcome 2 is rated as highly satisfactory.

Indicator No. 5: AMAT Indicator 3.2.2: Strengthened Capacity to transfer appropriate adaptation technologies				
	Baseline	End Target	Status at TE	TE Assessment
Value:	1: Very few professional are aware of adaptation technologies	3: High Capacity achieved (>75%). Provision of models, information systems, tools and training in the use of these to professionals, on various aspects of climate adaptation technologies	Capacity building has been a significant strength of the project, with extensive trainings delivered to water management sector and civil protection sector stakeholders.	Achieved
Date:	2013	Mar 2020	Nov 2019	
Indicator No. 6: No. of institutions enabled to modify risk management strategies based on introduced vulnerability, loss and damages assessment and improved hydrometric monitoring technologies				
	Baseline	End Target	Status at TE	TE Assessment
Value:	Most of the socio-economic information required to assess flood damages, losses, exposure and vulnerability is not currently available and is not collected systematically and gender-disaggregation of data not systematically done	GIS-based flood damages, losses and vulnerability assessment tool developed for VRB and systematic socio-economic survey methods established and implemented for VRB and introduces sex-disaggregated data collection protocols and methods	GIS-based tools have been developed and successfully disseminated and made available to municipalities and other users.	Achieved
Date:	2013	Mar 2020	Nov 2019	

Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in VRB

Achievement of Outcome 3 is rated as: Satisfactory

Achievement of Outcome 3 is rated as satisfactory.

Indicator No. 7: No. of people in target basin benefitting from FRM adaptation technologies, tools, and adaptation strategies, and are less exposed to flood risk				
	Baseline	End Target	Status at TE	TE Assessment
Value:	Current approach limited of inclusion of local communities, and particularly the vulnerable groups	At least 5 technologies transferred to 13 communities in community-based adaptation measures	The end target of transferring at least 5 technologies to 13 municipalities has been achieved.	Achieved
Date:	2013	Mar 2020	Nov 2019	
Indicator No. 8: No. of innovative Non-structural measures introduced and implemented as part of climate adaptation strategies to provide improved resilience to communities (include agric.)				
	Baseline	End Target	Status at TE	TE Assessment
Value:	Current approach to FRM is structural flood protection measures	Non-structural measures designed and implemented in 13 municipalities by 2020	Non-structural measures have reduced vulnerabilities in 13 municipalities, with substantial cofinancing from local governments.	Achieved

		At least 4,200 hectares of agric. land protected by non-structural measures (e.g. floodplain agro-forestry to be implemented on at least 840 hectares)	One of the non-structural measures entails protecting riverbank ecosystems with an agroforestry management system. Implementation was underway at the time of the TE mission in early November and completed later that month.	Mostly Achieved
Date:	2013	Mar 2020	Nov 2019	
Indicator No. 9: No. of communities benefitting from introduced forecasting, early warning, response and recovery technologies to support local communities at risk of flooding				
	Baseline	End Target	Status at TE	TE Assessment
Value:	FFEWS system currently disjointed and not fully electronically based	Fully integrated Flood forecasting and Early warning system implemented in VRB	The FFEWS has been set up and protocols were under development at the time of the TE mission in November 2019. The protocols were operationalized in Feb 2020. ⁹ Adaptive management will be required in the implementation of the system, making adjustments as experience is gained and new information is generated.	Achieved
Date:	2013	Mar 2020	Nov 2019	

4.2.2 Relevance

Relevance is rated as: Highly Satisfactory

The project was aligned with Objective CCA-3 of the Programming Strategy for the GEF SCCF for the period of 2010-2014: "Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology". The project remains relevant to the SCCF priorities, as the two subsequent SCCF programming strategies, for 2014-2018 and 2018-2022, contain similar technology transfer oriented objectives.

The project strategy is consistent with the priorities outlined in the countrywide 2013 Climate Change Adaptation and Low Emissions Development Strategy for BiH covering the period 2013 to 2025, and with the Environmental Approximation Strategy (EAS), adopted in May 2017. The main objective of the BiH EAS is to ensure strategic planning of the EU environmental acquis approximation with ultimate goal to improve state of the environment and ensure sustainable development. The project is relevant to the current development of the National Adaptation Plan (NAP) which is identifying resources and timelines for implementing climate change-related policies and strategies, aligning with the climate *acquis*¹⁰ and on building institutional capacities.

Climate change risk in the development of agriculture in BiH is recognized in the Strategic Plan for Rural Development of BiH (2018-2021) – Framework Document, including the increase in extreme weather conditions that have resulted in more frequent flooding and unpredictable seasonal conditions for some crops.

In terms of civil protection, the project interventions on strengthening capacities of civil protection units are in line with the preparations for BiH in becoming a participating state of the Union Civil Protection Mechanism (UCPM). The UCPM helped coordinate interventions in BiH during the 2014 floods, as BiH could request assistance in case of emergency to protect citizens, property, the environment and cultural heritage of the country. And, there is an ongoing EU-funded project on capacity building to prepare for full membership in the UCPM¹¹.

The development objectives of the project were aligned with United Nations Development Assistance Framework (UNDAF) and the UNDP Country Programme Document (CPD) for Bosnia and Herzegovina for the period of 2015-2019, specifically UNDAF Outcome 5, "By 2019, legal and strategic frameworks are enhanced and operationalized to ensure

⁹ Documentary evidence of operationalization of the FE EWS: agreement dated 11 February 2020 signed by the Director of the Sava River Watershed Agency in Sarajevo, the Director of Vode Srpske in Bijeljina, the Director of the Federal Hydrometeorological Institute in Sarajevo and the Director of the Hydrometeorological Institute of Republika Srpska in Banja Luka.

¹⁰ The climate *acquis* refers to EU legislation on greenhouse gas monitoring and reporting, EU emissions trading system, effort sharing decision, carbon capture and storage, transport/fuels, ozone layer protection, fluorinated gases and forests and agriculture.

¹¹ EU for Better Civil Protection, a EUR 1.5 million project initiated in March 2019. Delegation of the EU to BiH, europa.ba

sustainable management of natural, cultural and energy resources, and CPD Output 2 under this outcome, “Subnational actors implement climate change adaptation (CCA) and mitigation measures, sustainable energy access solutions, and manage natural resources sustainably. The project contributions towards strengthening disaster and climate risk management capacities are also consistent with UNDAF Outcome 3, “By 2019, there is effective management of war remnants and strengthened prevention and responsiveness for man-made and natural disasters, and CPD Output 2 under this outcome, “Legal and policy frameworks in place supporting implementation of disaster and climate risk management measures, including gender perspective”.

4.2.3 Efficiency

Efficiency is rated as: **Highly Satisfactory**

Supporting Evidence:

- ✚ The GEF funding addressed the key barriers highlighted in the project design.
- ✚ The project has managed to satisfactorily achieve the intended project outcomes within the allocated budget and 5-year implementation timeframe.
- ✚ Financial delivery exceeded 90% in each of the four years reported.
- ✚ Direct cash cofinancing from 11 VRB municipalities totaling USD 791,566 through September 2019.
- ✚ Total materialized cofinancing nearly 13 times the value of the GEF project grant.
- ✖ Financial audits or spot checks have not been made.

Expenditures:

As of 30 September 2019, total project expenditures incurred were USD 5,404,848, which includes USD 4,513,282 accounted towards the USD 5,000,000 GEF grant and USD 791,566 of direct cash cofinancing contributed by the Government of BiH, as broken down below in **Table 13**.

Table 13: Actual expenditures broken down by project component, 2015-Sep 2019

Outcome	Funding Source	Actual Expenditures, 2015 through September 2019 (USD)						Indicative Prodco Budget
		2015	2016	2017	2018	2019*	Total	
Component 1	GEF	77,555	172,507	240,761	113,709	21,040	625,573	655,000
	UNDP	0	0	0	0	0	0	277,000
Component 2	GEF	354,811	497,455	235,761	135,194	42,600	1,265,821	1,315,000
	UNDP	0	0	0	0	0	0	0
Component 3	GEF	22,020	219,121	529,388	1,044,605	598,561	2,413,694	2,780,000
	UNDP	0	0	0	0	0	0	1,223,000
Project Management	GEF	32,273	49,744	49,701	45,378	31,097	208,194	250,000
	UNDP	0	0	0	0	0	0	0
Sub-total, GEF	GEF	486,659	938,827	1,055,611	1,338,887	693,298	4,513,282	5,000,000
Sub-total, UNDP	UNDP	0	0	0	0	0	0	1,500,000
Cost sharing, Govt.	BiH	0	0	107,518	446,110	237,938	791,566	0
Total	GEF	486,659	938,827	1,163,129	1,784,996	931,236	5,304,848	6,500,000

Figures in USD

Source of budget figures: approved Project Document

Source of expenditures: Combined Delivery Reports (CDR), provided by UNDP

*2019 expenditures reported through September

Spending across the three project components have largely been consistent with the indicative sums outlined in the project document, with actual component-level expenditures lower by 5-10% of the budgeted figures for the full 5-year implementation timeframe.

Financial delivery has been very good, exceeding 90% in each of the four years reported between 2015 and 2018 (see **Figure 9**).

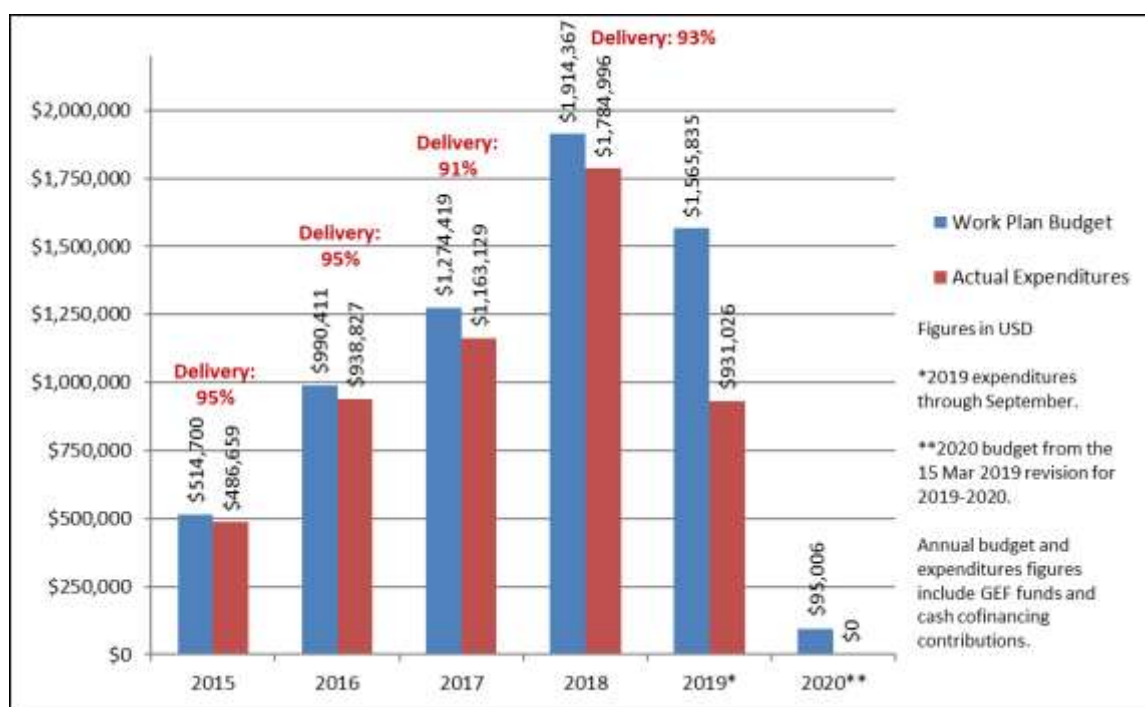


Figure 9: Planned annual budgets and actual expenditures, 2015-2019

Financial audits or spot checks have not been made of the project implementation. With more than USD 1 million expended annual in 2017 and 2018, and >USD 900,000 in 2016, it would have been prudent to carry out at least one financial audit. (lesson learned)

The TE is not a substitute for a financial audit, but there was documentary evidence available indicating satisfactory due diligence in the management of project funds. For example, procurements of project activities were publicly advertised, including the non-structural measures completed under Component 3. The 20 non-structural measures completed in 11 municipalities from Aug 2017 to November 2019 had a cumulative value of USD 2,205 million, with approx. USD 1.336 million contributed from the VRB project funds, which is 27% of the GEF project grant. An evaluation committee reviewed the submitted proposals and reached decisions regarding the selected contractor. The evaluation committee, which consisted of members of the UNDP project team, could have had broader representation, including from the government sector. (lesson learned)

The largest value non-structural measure, involving storm water drainage in the municipality of Gradiška, was USD 611,745.32, with USD 348,143.51 from GEF funds and USD 263,601.82 in cofinancing. Considering there was only one bidder in this 2019 procurement, a case report was prepared for review and approval by the UNDP Regional Chief Procurement Officer (RCPO). The report provided a value-for-money analysis and an explanation regarding why there was only one bidder, e.g., specialized construction techniques required, tight labor market, inability or reluctance to issue a bid security deposit and remoteness of the location. The RCPO approved the decision based upon the detailed back-up information provided.

Asset management:

With respect to asset management, the project team provided an inventory report dated September 2015 that included four laptop computers having a combined value of USD 10,180.

The titles of the assets purchased for the project beneficiary agencies have reportedly been transferred to the beneficiaries by the UNDP. The following transfer of title documents were provided to the TE Consultant for review:

- Hydrometeorological equipment to the Federal Hydrometeorological Institute of FBiH, Feb 2016.
- Hydrometeorological equipment to the Republic Hydro-Meteorological Institute of RS, Feb 2016.
- Automatic hydromet equipment to the Republic Hydro-Meteorological Institute of RS, Feb 2017.
- Equipment to municipal civil protection units in 14 municipalities in the VRB, May 2017.
- Non-expendable supplies and equipment to the Cantonal Civil Protection Administration of Central Bosnia Canton, Jan 2019.

- Non-expendable supplies and equipment to the Republic Administration of Civil Protection of the RS, Jan 2019.

Materialization of cofinancing:

The cumulative amount of cofinancing confirmed at project entry was USD 77,260,000, committed from the Ministry of Agriculture, Forestry and Water Management of RS, the Sava River Watershed Agency of FBiH and the UNDP (see **Annex 7**). According to inputs from the project team and information contained in the midterm review report, the amount of cofinancing materialized by 24 December 2019 is USD 64,831,910, or 84% of the total confirmed at project entry (see **Table 14**).

Table 14: Summary of materialized cofinancing

Sources of Cofinancing	Name of Cofinancer	Type of Cofinancing	Cofinancing Amount (USD)	
			Confirmed at project entry	Materialized by TE
GEF Agency	United Nations Development Programme (UNDP)	Cash	1,500,000	1,500,731
		In-kind	60,000	60,000
Recipient Government	Ministry of Agriculture, Forestry and Water Management of RS	Cash	75,000,000	61,668,856
Recipient Government	Sava River Watershed Agency of FBiH	Cash	700,000	763,408
Recipient Government	Vode Srpske	Cash	0	47,348
Recipient Government	Municipalities within the VRB	Cash	0	791,566
Total			77,260,000	64,831,910

Confirmed cofinancing values obtained from signed cofinancing letters annexed to the approved project document.

The USD 1,500,000 of cash cofinancing from the UNDP was integrated into the total budget and work plan (TBWP) in the project document, implying cost-sharing at the project level. The materialized cofinancing reported in the letter issued by UNDP on 22 June 2018 indicates contributions from three projects: UN Recovery from floods (Project ID 00090943, UN Response to BiH floods (Project ID 00090579) and EU Flood recovery programme (Project ID 00091517). There has reportedly been no further cash cofinancing from UNDP from the period of June 2018 to the time of the TE. The complementary activities completed on the three listed projects represents parallel cofinancing for the VRB project, not cost-sharing at the project level. The USD 1,500,000 cash cofinancing should not have been integrated into the TBWP. (lesson learned)

The 22 June 2018 letter from UNDP also indicates that more than USD 60,000 of in-kind cofinancing contributions have materialized, attributed to 25% of the costs of the salaries of the Energy and Environment Sector Leader and Sector Associate, as well as rent of premises and services costs.

The largest proportion of the project cofinancing was committed by the Ministry of Agriculture, Forestry and Water Management of RS in relation to the EUR 75 million loan issued in 2014 for emergency reconstruction of flood protection facilities along the Sava River and its tributaries. As part of the midterm review of the project, the ministry issued a cofinancing letter report on 19 April 2018, indicating a cumulative investment of BAM 67,913,932.19 (est. USD 42,952,781, based on an exchange rate of 1.58113 on 19 April 2019) for 39 projects completed under the EIB loan during the period of 2014-2017. A separate letter report dated 24 December 2019 (see **Annex 5**) documents an additional 11 interventions completed over the period of 2017-2019 for a cumulative sum of BAM 33,022,266.35 (est. USD 18,716,073.83, based on an exchange rate of 1.76438 on 24 December 2019).

The Sava River Watershed Agency is another cofinancing partner, with USD 700,000 in grant cofinancing committed at CEO ER. The agency submitted a letter on 16 April 2018, as part of the project midterm review, indicating that BAM 1,142,443.12 (est. USD 717,953.26, based on an exchange rate of 1.59125 on that day) for complementary activities completed during the period of 2014-2017. An additional USD 45,455 has been contributed by the Sava Watershed Agency, in support to the cost for the VRB flood forecasting and early warning system (FFEWS). The Vode Srpske also supported the cost of the FFEWS with a contribution of USD 47,348.

There has also been cash cofinancing from twelve (12) VRB municipalities as part of the completed non-structural measures. Based on combined delivery reports (CDRs) from 2017, 2018 and 2019 (Jan-Sep), a cumulative amount of USD 791,566 have been contributed by 12 VRB municipalities. These contributions have materialized during project implementation, i.e., they were not identified in the CEO ER.

4.3 Sustainability

Sustainability is generally considered to be the likelihood of continued benefits after the GEF funding ends. Under GEF criteria each sustainability dimension is critical, and the overall ranking, therefore, cannot be higher than the lowest one.

Overall:

Likelihood that benefits will continue to be delivered after project closure: Moderately Likely

Supporting Evidence:

- + Continued donor funding towards flood risk management, including ongoing EU funding and a GCF project that will be submitted for approval in the first half of 2020.
- + Transposing the EU Flood Directive in RS is a significant step towards institutionalizing flood risk management.
- + VRB flood risk management plan provides a practical framework for prioritizing investment from domestic and international sources for further reducing flood risks.
- + A proportion of revenue collected from water tariffs in FBiH are earmarked for operation and maintenance of hydrometeorological stations. Similar arrangements have been made through allocation of finances from the RS Fund for Environmental Protection and Energy Efficiency.
- + Strong commitment from private insurance sector partners in continuing the development of an affordable natural disaster insurance product.
- Constraints in realizing an approved flood risk management plan across the entire VRB due to the complex institutional arrangements in FBiH and RS.
- VRB local governments have limited funds for carrying out regular maintenance of cleaned out stream channels, reinforced embankments and other non-structural measures completed.
- Challenges in aligning with the EU environmental *acquis*.

Financial Dimension:

Likelihood that benefits will continue to be delivered after project closure: Likely

With respect to the financial resources dimension of sustainability, a rating of “likely” has been applied.

There is continued donor support for flood risk management, including but not limited to the following:

- Long-standing funding from the EU, including the EUR 5 million IPA II “Support to Flood Protection and Flood Risk Management” program
- The proposed USD 14 million GCF project “Scaling up climate resilient flood risk management in Bosnia and Herzegovina” that is expected to be submitted for approval in the first half of 2020.
- The GEF-World Bank West Balkans Drina River Basin Management (WBDRBM) Project for South Eastern Europe and Balkans is to improve mechanisms and capacity of the project countries to plan and manage the trans boundary Drina River Basin (DRB), incorporating climate change adaptation, running from 2017-2021.
- GCF-funded project on advancing the National Adaptation Plan (NAP) process for medium-term investment planning in climate sensitive sectors in Bosnia-Herzegovina (2018-2021).
- “EU 4 Better Protection – Capacity Building and Preparation of Bosnia and Herzegovina for the Union Civil Protection Mechanism”, in the amount EUR 1.5 million, implemented by the end of 2021.

The financial sustainability of the operation and maintenance of the expanded hydrometeorological network realized under the project is variable. In the FBiH, a proportion of the revenue collected from water tariffs is earmarked for the operation of hydrometeorological stations. At the time of the TE mission in November 2019, these financing arrangements were not fully sorted out in RS. Over the timeframe of November 2019 and February 2020, arrangements have been made to finance the operation and maintenance of the hydromet network through allocations from the RS Fund for Environmental Protection and Energy Efficiency.

There are funding constraints among VRB local governments for sustaining regular maintenance of the completed non-structural measures, such as cleaning out stream channels and reinforcing embankments. For instance, during the TE field mission in November 2019, one of the stream channels cleaned out in 2017-2018 under a non-structural measure

completed in the Laktasi Municipality was overgrown with vegetation. The official from the municipality accompanying the field visit indicated that maintenance of stream channels is organized roughly every 2-3 years, due to operating budget limitations.



Figure 10: Overgrown vegetation in cleaned out stream channel, Laktasi Municipality, 05 Nov 2019

From a macro level, gross domestic product (GDP) has steadily increased over the past 5 years, averaging approximately 3% year-on-year, as shown below in **Figure 11**, but there remain constraints in public financing across the country.

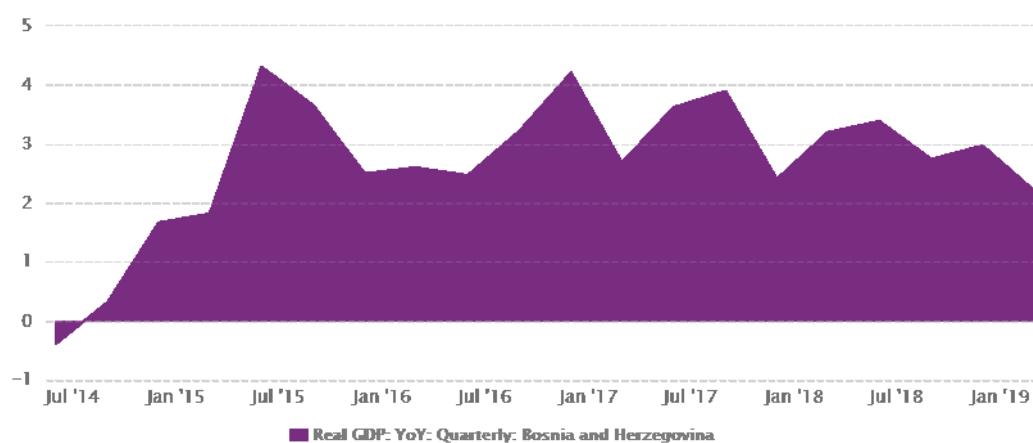


Figure 11. Real GDP for Bosnia and Herzegovina, Jun 2014 to Jan 2019

Socio-Economic Dimension:

Likelihood that benefits will continue to be delivered after project closure: Likely

With respect to the financial resources dimension of sustainability, a rating of “likely” has been applied.

The project has made substantive contributions towards reducing vulnerabilities to increase flood risks due to climate change in the VRB, through development of an improved flood forecasting and early warning system, enabling more timely response and mitigation; strengthening the capacities of civil protection units among VRM municipalities; development of flood risk and flood hazard maps, enabling municipality level officials to make more informed decisions with respect to spatial planning; implementation of 20 non-structural measures in 11 VRB municipalities, providing protection to at-risk communities; and preliminary development of natural disaster insurance coverage, particularly for residential stakeholders.

With respect to the natural disaster insurance coverage, based on feedback from stakeholder interviews during the TE mission, there is strong commitment among the private insurance sector to continue developing and advocating for the establishment of the envisaged obligatory coverage. And, the proposed GCF project would support further advancement of the envisaged insurance. The preliminary analyses have estimated that a penetration rate of 25% would be required for the mandatory insurance in order for it to be viable. The Romanian mandatory insurance product also has a target of 25% penetration rate. In approximately 10 years since the coverage was introduced in Romania, from 2008 to the end of 2018, there were 1,704,634 policies written, representing a penetration rate of 18.99% (see Figure 12).

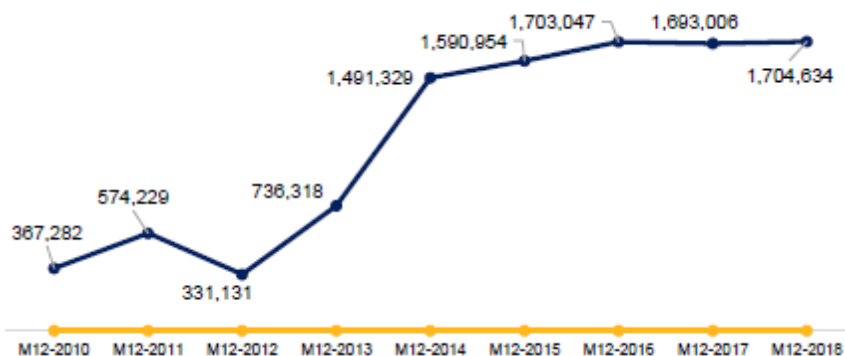


Figure 12: Penetration rate of natural disaster insurance in Romania, 2010-2018¹²

The Romanian policy covers floods, earthquakes and landslides. The insurance working group on the VRB project have considered that if storm damage is added to the policy, it would be easier to market the product and achieve at least 25% penetration.

Institutional Framework and Governance Dimension:

Likelihood that benefits will continue to be delivered after project closure: Moderately Likely

With respect to the institutional framework and governance dimension of sustainability, a rating of “moderately likely” has been applied.

The institutional strengthening achieved on the VRB project through delivery of capacity building and transfer adaptation technologies and approaches has substantively contributed to improvements in the institutional framework regarding flood risk management in the VRB. And, flood risk governance has been improved in the VRB, with increased coordination and collaboration among hydromet institutions and water agencies in the two entities.

There are a few factors that diminish the likelihood that project results will be sustained. Firstly, the limited harmonization across entities. For instance, the VRB flood risk management plan was approved by the RS, but not by the FBiH. Inconsistent harmonization is not restricted to flood risk management. The Analytical Report¹³ accompanying the document on communication from the Commission to the European Parliament and the Council, Commission Opinion on Bosnia and Herzegovina’s application for membership of the European Union, contains the following entries:

- “Due to the complex political and institutional set-up, lack of political consensus and awareness, understaffing and scarce financial resources, progress with legal and policy measures requires considerably greater efforts and much more time than in other countries. This has created a considerable backlog in aligning with the EU *acquis* in this area (environment).”
- “Bosnia and Herzegovina has no state-level law on environmental protection and no state-level authority exclusively dealing with the environment. The alignment of legislation with the *acquis* has been undertaken so far without a National Programme for the Adoption of the Acquis (NPAA) in place or a vertically coordinated approach.”
- “A countrywide environment approximation strategy was adopted in 2017, and supplemented by more specific environmental approximation programmes for the entities and Brčko District. There are few sub-sector strategies at state and entity level in place. These are mostly not harmonised between the entities for the respective areas covered.”

¹² Source: presentation by the CEO of PAID (N. Radu) entitled “Mandatory home insurance in Romania”.

¹³ Reference:{COM(2019) 261 final}, Brussels, 29.5.2019, SWD(2019) 222 final.

Environmental Dimension:

Likelihood that benefits will continue to be delivered after project closure: Likely

With respect to the environmental dimension of sustainability, a rating of “likely” has been applied.

The project strategy emphasizes increasing the resilience of vulnerability communities to risks of floods, but there are inherent environmental benefits as well. The flood risk management plan developed for the VRB provides a framework for improved management of both natural resources and the built-up environment. Implementing improved management of upland regions in the basin, for example, will enhance soil and water conservation, which will in turn maintain ecosystem functions and services and enhance habitat integrity. Encouraging the implementation of non-structural measures to control the risks of floods also have benefits to the environment, e.g., protecting habitats within floodplains and conserving riverine species of plants and animals.

Achieving long-term environmental sustainability in the VRB will require improved stakeholder engagement, particularly with the energy (hydropower) and forestry sectors. Regulation of hydraulic regimes in the basin is important in terms of flood risk management, but also for ensuring optimal ecological flows. Forest governance and management practices need to be strengthened to minimize forest loss, maintain ecosystem integrity and ensure sustained socioeconomic co-benefits.

4.4 Progress towards impact

Strengthened resilience:

The 638,600 ha Vrbas River Basin (VRB), with 213,740 inhabitants as direct beneficiaries of which 52.2% are women, is under improved management for climate resilience through development of a flood forecasting and early warning system (FFEWS), which included deployment and transfer of the following hydrometeorological equipment: twenty (20) precipitation stations, seven (7) hydrological stations and two (2) automatic meteorological stations; coordinated online data management and communication protocols; and is supported by a comprehensive, flood risk management (FRM) plan.

Contributions to Changes in Policy/Legal/Regulatory Enabling Frameworks:

The project has been substantive contributions to enabling legal and regulatory frameworks.

- Amendments to the Law on Waters, Republika Srpska, effectively transposing EU Flood Directive (Gov. Gazette No. 74/17, 07 August 2017)
- RS Decree on the elements of a flood risk management plan (Gov. Gazette No. 115/17, 23 December 2017)
- Flood risk management plan for the RS sections of the VRB
- Amendments to Law on Spatial Planning to include flood maps and climate changes have been adopted by the National Assembly in Official Gazette No. 84/19, 10 October 2019.
- Flood hazard and risk maps together with building codes have been made public and are available to citizens of VRB municipalities.
- Draft flood zoning policy for floodplains, together with of guidance documents for integration of flood risk in spatial plans at local level has been developed.

Arrangements to Facilitate Follow-up Actions:

The project has a strong emphasis on institutional strengthening, enabling relevant stakeholders to operate the improved flood forecasting and early warning systems. The strengthened coordination between the RS and FBiH hydromet institutes and water agencies are essential for facilitating follow-up actions. Roles and responsibilities will be clarified through operationalizing the flood forecasting and early warning system (FFEWS).

The participatory GIS geoportal (PGIS) is an interactive platform for facilitating information sharing information on spatial infrastructure for hydrometeorological data for municipalities and public citizens.

UNDP resident operations in BiH contribute important arrangements for facilitating follow-up actions, including implementing complementary projects, such as the GCP project under development, providing advocacy and mediation support to advance policy and legal reform, such as what is required to move forward with the conceptualized natural disaster insurance coverage.

Follow-up actions are also facilitated through existing institutions, such as the Sava River Watershed Agency, and teams leading complementary projects (WBIF, IPA, World Bank, GIZ, etc.).

Replication:

There is evidence of replication occurring during the implementation phase of the project, including the following:

- The flood risk management planning methodology developed for the VRB project has been replicated for application for the following basins¹⁴:
 - Flood Risk Management Plan for the Sava River Basin in FBiH
 - Flood Risk Management Plan for Watershed of Adriatic Sea in the FBiH
 - Flood Risk Management Plan for district Sava River Basin in Republika Srpska,
 - Flood Risk Management Plan for district Trebišnjica River Basin in Republika Srpska
 - Flood Risk Management Plan for the Brčko District BiH
 - The Roof Report – Framework Plan for Flood Risk Management in BiH, which contains key foundations for inter-basin cooperation and coordination, pertaining to efficient monitoring and integrated implementation of flood risk management, with a special reference to transboundary watercourses in BiH.
- Water agencies have agreed to use the FFEWS platform developed by the project for three basins with similar geographical features: Bosna, Una-Sana and Drina.¹⁵
- The International Sava River Basin Commission adopted the Vrbas River model for the regional EWS.
- Procurement of the same type of hydrometric stations for the projects on the Bosna and Drina rivers.¹⁶
- Implementation of non-structural measures, following completion of the ones constructed under the project.¹⁷
- Vulnerability assessment methodology developed for the VRB is planned to be applied for the GCF project that is currently under development.

5 Assessment of Monitoring & Evaluation Systems

5.1 M&E Design

Monitoring and Evaluation design at entry is rated as: Satisfactory

The M&E plan was developed using the standard UNDP template for GEF-financed projects. The indicative budget for the M&E plan was USD 105,000 (excluding PIU and UNDP staff time and travel expenses), which is 2.1% of the USD 5,000,000 GEF project grant. The M&E budget was broken down into only four items: USD 10,000 for the inception workshop and report, USD 40,000 for the midterm review, USD 40,000 for the terminal evaluation, and USD 15,000 for financial audits. The level of resources allocated for M&E is considered by the TE Consultant to be low. According to the UNDP template for GEF-7 projects, the M&E budget should be 5-7% of the value of the total GEF grant.

Many of the M&E responsibilities, as indicated in the M&E plan, were assigned to the project manager and project team. The terms of reference (TOR) for the project manager includes responsibility for preparing progress reports and delivery of project outcomes; however, other M&E tasks, such as verification of project results, were not clearly articulated in the TOR's for the project manager and team members. (lesson learned)

5.2 M&E implementation

Implementation of Monitoring and Evaluation Plan is rated as: Satisfactory

The quality of implementation of the M&E plan was found to be satisfactory. M&E results were documented in project implementation review (PIR) review reports. The project board was an important platform for M&E, providing strategic feedback to issues raised through project reporting and discussions during the board meetings.

¹⁴ Source: Terms of reference for Flood Risk Management Plans developed in Bosnia and Herzegovina, Sarajevo, November 2018.

¹⁵ Source: Terms of reference for development of the hydrological flood forecasting system for Sava River Basin (Phase 1. Bosna River), 15 January 2016.

¹⁶ Source: Specifications for the hydrometeorological stations set up for the Bosna River, 2019

¹⁷ Source: Testimonial evidence provided by interviewed municipality officials during the TE mission, November 2019.

The project inception report, issued in January 2016 and covering the 6-month inception period from March-September 2015, provides a comprehensive summary of the project, an update of project risks and details on several of the key technical interventions. The project results framework was not critically reviewed during the project inception workshop or during the project inception. For instance, the updated GEF Programming Strategy on Adaptation to Climate Change for the LDCF and SCCF was issued in October 2014, prior to the start of the project. The indicators in the project results framework that were linked to the earlier CCA programming strategy could have been adjusted during project inception. (lesson learned)

Tracking tools:

The baseline assessment was made with the 2010-2014 version of the CCA tracking tool. The 2014-2018 version, introduced in October 2014, was used for the midterm assessment. Starting in the GEF-6 replenishment cycle, the GEF has made significant changes to how tracking tools are used for GEF Trust Fund projects. Climate change adaption is only funded through the LDCF and SCCF and the most recent CCA tracking tool was released in October 2019 for the 2018-2022 programming strategy. The relevant indicators to the VRB project are similar to those in the 2014-2018 tracking tool, including the following:

- Core Indicator 1: Total number of direct beneficiaries (male, female).
- Core Indicator 2: Area of land managed for climate resilience (ha).
- Core Indicator 3: Total number of policies/plans that will mainstream climate resilience.
- Total number of people trained (male, female).
- Objective 1: Technologies and innovative solutions piloted or deployed to reduce climate-related risks and/or enhance resilience.
 - Output 1.1.1. Physical and natural assets made more resilient to climate variability and change
 - Output 1.1.3. New/improved climate information systems deployed to reduce vulnerability to climate hazards/variability.

The TE Consultant recommends carrying out a terminal assessment using the 2018-2022 CCA tracking tool, for the relevant sections listed above.

Responses to midterm review recommendations:

The recommendations from the midterm review have been satisfactorily addressed by the project during the second half of the implementation timeframe, as summarized below in **Table 15**.

Table 15: Summary of management responses to MTR recommendations

Midterm review recommendation	Status at terminal evaluation
1. Repeating exposure through on-the-job training is necessary to ensure long term sustainability of the new technologies	The project has continued to provide trainings on a variety of topics, including flood forecasting and early warning, hydrological and hydraulic modelling, etc.
2. More emphasis, capacity building and knowledge transfer regarding "making room for water" and/or "living with floods" concepts to beneficiaries would be highly beneficial in order to enable these beneficiaries to further develop means for holistic flood management in their jurisdictions.	The VRB flood risk management plan contains a mix of non-structural and structural measures. Further capacity building will be required moving forward, as many water management sector officials have deep-seated opinions on the use of structural measures to control flood risks.
3. The government of BiH as well as entities and municipalities will need to find ways and conduct the necessary legal adjustments to collect and/or allocate the necessary funds to ensure long term sustainability of the flood protection, adaptation and warning interventions. It is expected that capital intensive maintenance and replacement works will become necessary in the future that will need respective financing. Financing will need to cover both capital costs and staffing costs. The project is to develop a sustainability strategy with as exact as possible financial projections in cooperation with the respective stakeholders .	With continued donor support, e.g., from the EU, GEF and the proposed GCF project, there remains a predominant project-based approach towards funding certain systems, such as information management systems. The FBiH Hydromet Institute receives funding for operation and maintenance of hydrometeorological stations from a proportion of revenue collected through water tariffs. These funding arrangements are not in place in RS. And, there remain shortcomings among municipality operating budgets to keep up with the required maintenance of flood control measures.
4. Guidelines for potential upscaling including lessons learnt should be produced. Upscaling of project methodologies and results should be done through concrete project proposals covering other flood prone river basins in Bosnia and Herzegovina.	Many of the best practices under the VRB project were considered in the development of the proposed GCF project, as well is for the ongoing EU-funding on flood risk management.

Midterm review recommendation	Status at terminal evaluation
5. Explore implementation of agro-forestry measures with direct involvement of beneficiaries e.g. project to provide seedlings and municipality or farmers to provide labor for planting.	One of the non-structural measures under the project entails reinforcement of embankments and floodplains through implementation of an agroforestry management system. This can be considered as a demonstration intervention; it will take time to convince farmers and other stakeholders to consider implementing agroforestry based systems, as there is limited practice locally.
6. The project should support development of by-laws that will regulate the development of the flood risk management plan and continue with the development of the Vrbas river basin flood risk management plan as a pilot for the rest of BiH.	The EU Flood Directive has been transposed and the VRB flood risk management plan has been adopted in the RS; however, not in the FBiH, where officials are waiting for the development of countrywide flood risk management plans that are slated to be completed under the ongoing EU-funded project.
7. Insurance models with applicable tariffs to be developed and discussed with stakeholders. Simulation of the model can be initiated in pilot municipalities. In order to ensure necessary insurance take-up, the 'solidarity' approach for financing should be explored.	Considerable progress has been made since the midterm review on further investigating and conceptualizing natural disaster insurance in BiH. The developments have occurred in FBiH, less so in RS. The insurance working group reached the conclusion that a mandatory natural disaster insurance product is most viable for BiH, similar to coverage introduced in Romania in 2008. The proposed GCF project includes an activity on further advancing development of natural disaster insurance in BiH.

6 Assessment of Implementation and Execution

Quality of Implementation and Execution is rated as: Satisfactory

The project was run under a direct implementation modality (DIM), with UNDP as the implementing partner and executing agency. Implementation support was provided by the Ministry of Spatial Planning, Construction and Ecology of RS – which is the UNFCCC focal point for BiH – and the Ministry of Foreign Trade and Economic Relations (MoFTER) – which is responsible for coordination of activities and harmonization of plans of entity bodies and institutions in the fields of environmental protection, development and use of natural resources, and tourism.

The project team was based in the UNDP offices in Banja Luka and Sarajevo, working closely with the UNDP CO in Sarajevo and coordinating with governmental partners in RS and FBiH. The project benefited from effective and consistent project management, led by the Project Manager, who is also managing the National Adaptation Plan (NAP) project, and supported by highly qualified project officers and administrative support staff who are also working on other projects in the UNDP energy and environment portfolio. These arrangements provide a higher level of continuity, saves considerable time in recruiting a separate project team for each new project, and facilitates synergies across projects in the portfolio.

The UNDP CO provided administrative and strategic guidance throughout the project development and implementation phase. Apart from USD 1.5 million of parallel grant cofinancing, UNDP provided more than USD 60,000 of in-kind cofinancing, which includes a share of the salaries of CO staff and costs for office premises and services.

The UNDP regional technical advisor (RTA) has also been actively involved, providing overall guidance during the project preparation phase. Project progress reports provided candid accounts of issues, and these were followed up during project board meetings. Moreover, the international Chief Technical Advisor (CTA) provided consistent strategic guidance from project conceptualization, project development and throughout project implementation.

There have been nine (9) project board meetings, convened approximately twice per year over the period of 16 October 2015 until 16 May 2019 (see **Table 16**).

Table 16: Project board participation, Oct 2015 to May 2019

Member	16 Oct 2015	19 Jan 2016	09 Jun 2016	23 Sep 2016	20 Feb 2017	20 Sep 2017	02 Feb 2018	18 Oct 2018	16 May 2019
Chair, Minister, Ministry of Spatial Planning, Construction and Ecology of RS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Member, Head of Water Resources Department, Ministry of Foreign Trade and Economic Relations of BiH	✓	✓	✓			✓		✓	✓
Member, Expert Advisor, Ministry of Agriculture, Water Management and Forestry of FBiH	✓		✓	✓	✓	✓	✓	✓	✓
Member, Senior Associate, Ministry of Agriculture, Forestry and Water Management, RS	✓		✓	✓	✓	✓	✓	✓	
Member, Head of UNDP Energy and Environment Sector	✓	✓	✓	✓	✓	✓	✓	✓	✓

The board has high level representation, with the Minister of the Ministry of Spatial Planning, Construction and Ecology of RS, as the chair, who has led each of the nine board meetings, the Head of the Water Resources Department of the MoFTER, Expert Advisor of the Ministry of Agriculture, Water Management and Forestry of FBiH, Senior Associate of the Ministry of Agriculture, Forestry and Water Management of RS, and the Head of the UNDP Energy and Environment Sector. Rotated between Banja Luka and Sarajevo.

The board meetings have rotated between Banja Luka and Sarajevo – the rotation of the meeting venue is a good practice in promoting coordination and collaboration across entities. Based on review of the minutes of the board meetings, participation has been high throughout, there is a consistent mention of coordination with other projects (good practice), project results and plans are presented and discussed efficiently and follow-up actions are addressed in subsequent meetings.

A few lessons learned and room for improvement regarding project implementation and execution include:

- Expand upon the level of country ownership on the project by including the annual work plans and PIR reports into the agendas for the project board meetings, and involving governmental sector stakeholders onto the review committees evaluating project procurement results.
- Consistent with the project objective, include a criterion addressing highly exposed rural poor, returnee and displaced persons in the evaluation matrix for the non-structural measures.
- Provide additional details on resource allocation in the annual work plans.

7 Other Assessments

7.1 Need for follow-up


There are a few issues that should be followed up after project closure, including:

- Implement the action plan under the sustainability strategy for the project, one of the recommendations of the midterm review, and including securing financing for long-term operation and maintenance of hydrometeorological stations.
- Operationalizing the flood forecasting and early warning system for the VRB.
- Developing a flood risk management plan for the section of the VRB in FBiH.
- Continuing to advance the natural disaster insurance coverage, including development of the requisite legal framework.

7.2 Contributions towards achievement of Sustainable Development Goals (SDGs)

The project has made substantive contributions toward achievement of SDGs, as outlined below in **Table 17**.

Table 17: Project contributions towards achievement of SDGs

SDG target	Project contribution
 Goal 13. Take urgent action to combat climate change and its impacts	
Target 13.1. Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.	The 638,600 ha Vrbas River Basin is under improved management for climate resilience. Transfer of adaptation technology focused on the 13 municipalities (out of a total of 28 in the VRB) that are most susceptible to flooding; the cumulative number of inhabitants, project direct beneficiaries, in these 13 municipalities is 213,470, of which 52.2% are women.
Target 13.2. Integrate climate change measures into national policies, strategies and planning.	Climate change measures integrated into the VRB flood risk management plan, and the VRB flood forecasting and early warning system.
Target 13.3. Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	Coping capacities of central (RS and FBiH), canton and municipality level civil protection units (CPUs) strengthened through technical training delivered to 571 CPU personnel and municipal officials (including 113 women), information disseminated to the public through radio, television, internet and print media.

Secondary contributions have been made to SDG 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture), SDG 5 (Achieve gender equality and empower all women and girls), SDG 6 (Ensure availability and sustainable management of water and sanitation for all), SDG 11 (Make cities and human settlements inclusive, safe, resilient and sustainable), and SDG 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

7.3 Environmental and social safeguards

Environmental and social risks were screened at the project preparation phase and recommendations for implementing safeguards for each project component developed.

Considering that the overall objective of the project was to increase resilience of vulnerable communities in the VRB, environmental and social safeguards were intrinsically included in the project strategy. The vulnerability methodology and the vulnerability assessments completed addressed environmental and social risks, including those related to marginalized groups, such as highly exposed rural poor, returnee and displaced persons. The flood risk and flood hazard maps and the flood risk management plan took into account the results of the vulnerability assessments.

Marginalized groups were also emphasized in conceptualizing the most appropriate natural disaster insurance coverage. The originally envisaged index-based approach was concluded to be more relevant for agricultural lands, and the mandatory product that was ultimately recommended focused on the residential sector and particularly those homeowners who are most vulnerable, not only in terms of their physical location in the basin but also on affordability.

The non-structural measures implemented in 11 VRB municipalities (through September 2019) also contributed to reductions in vulnerabilities of at-risk communities. The evaluation criteria, however, did not specifically consider marginalized groups. (lesson learned)

7.4 Gender concerns

Gender mainstreaming results were achieved on the project, including generating gender disaggregated data through the socioeconomic surveys completed as part of the vulnerability assessments; incorporating gender disaggregated data into community-driven flood intervention plans for the VRB municipalities; training women on reducing flood risks, e.g., protection of health and property, and preparedness for coping with flood events; and women were actively involved in leadership roles in the implementation of the project.

A gender marker of GEN 2 was applied for the project, which means that outputs have gender equality as a “significant” objective.¹⁸ One of the project outputs contain reference to gender: Output 3.3, “Local communities (particularly women and refugees) trained to implement and maintain flood resilient non-structural intervention measures, including agricultural practices such as agroforestry, to improve livelihoods of 13 communities in the VRB, and community-based flood early warning systems”. Targeting the number of women to train does not fully meet the criteria for a GEN 2 marker output. UNDP guidance¹⁹ on gender-related investments states the following:

“Ratings 3 and 2 require a focus on gender equality and women’s empowerment as an objective for the expected output, rather than on having women and girls as a target group. This is because some outputs and related activities that target primarily women may not contribute to gender equality.”

The project document includes a section on “gender and vulnerable groups” and a gender indicator matrix (copied below in **Table 18**); however, these metrics were not integrated into the project results framework and not all of the targets were monitored and evaluated during project implementation.

Table 18: Gender baseline assessment and targets to be achieved through each output (from project document)

Expected Outcomes	Baseline	Target Indicator
1. Key relevant development strategies/policies/legislation integrate climate change-resilient flood management approaches	No existing sectoral plans or policies include a gender responsive approach. Low gender balance in flood risk management	At least two priority sectoral policies and plans (e.g. agriculture, hydropower, water resources) to include gender disaggregated data, and use gender analysis in their design and included gender indicators for implementation.
2. Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities	Currently no sex-disaggregated data collected in VRB. Loss and damages assessment do not include gender-specific tangible and intangible losses	Introduction of sex-disaggregated data collection protocols and methods. Introduction of GIS-based vulnerability, loss and damages which incorporate gender specific vulnerability, loss and damages calculation methods (e.g. ECLAC method)
3. New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in VRB	Community-based adaptation strategies, technologies and practices do not secure participation of women, nor include them in trainings and communication circles.	Secured minimum of 40% of women in participatory community-based adaptation strategies, technologies and practices implemented in priority flood risk areas
	Early warning systems and Municipal-level flood response and preparedness plans are gender blind.	Early warning system in VRB and Municipal-level flood response and preparedness plans are fully engendered.

A gender assessment for each of the three project outcomes was presented in the project document, along with target indicators. However, a gender analysis and action plan were not prepared during the project preparation phase. The gender analysis and action plan referenced in the PIR report is the document prepared in 2019 for Flood Risk Management in Bosnia and Herzegovina – this document was developed to support the proposed GCF project, which would upscale many of the FRM approaches developed and implemented on the Vrbas project.

7.5 Stakeholder engagement

Stakeholder consultations during the project preparation phase and involvement during implementation were primarily among state and entity level water management sector partners, including ministries responsible for water management, water agencies, hydro meteorological institutes, climate change focal point in BiH (Ministry of Spatial Planning, Construction, and Ecology of Republika Srpska), as well as municipalities, including spatial planning and civil protection units.

The stakeholder involvement plan contained in the project document did not include specific strategies or identification of key stakeholders in the agricultural and energy (hydropower) sectors. Output 1, for instance, called for “at least two priority sectoral policies and plans (agriculture and hydropower) updated to include climate change modeling results”. There was some involvement by the agricultural sector, e.g., delivery of training on farming in the floodplains of the VRB, and hydropower sector stakeholders were engaged in developing the protocols for the FFEWS. However, there was no clear strategy regarding stakeholder engagement for achieving the envisaged results under Output 1.1, i.e., “robust sector policy frameworks incorporating climate change developed for at least 2 sectors”.

There are also opportunities for improvement with respect to engaging with the forestry sector. During the development of the VRB flood risk management plan, the importance of the ecosystem functions delivered by forests in the basin was highlighted.

¹⁸ Financing for Gender Equality and Tracking Systems, Background Note, September 2013, United Nations Development Group (UNDG)

¹⁹ BDP, UNDP Gender Team (2009). Guidance Note: Tracking Gender-Related Investments and Expenditures in Atlas

The project has facilitated meaningful engagement with the private insurance sector, regarding conceptualizing natural disaster insurance coverage. It might have been prudent to have carried out additional consultations during the project preparation phase, e.g., to critically review the originally proposed index-based approach to risk transfer. (lesson learned)

8 Conclusion, Recommendations and Lessons

CONCLUSIONS

The relevance of the project was substantiated in 2014 when extensive areas in BiH were devastated by record-setting flood events; the project concept was submitted in January of that year, before the flood events. The GEF funds have provided important incremental benefits to the flood risk management (FRM) efforts in BiH, specifically in the Vrbas River Basin (VRB). Shortly after the 2014 floods many donor partners and financial institutions disbursed technical and financial assistance, including the European Investment Bank (EIB) which extended a EUR 55 million loan in 2014 for reconstruction of emergency flood protection structures in the Sava River Basin. The activities completed under the EIB loan comprised the largest proportion of cofinancing for the project. The GEF grant has funded a series of complementary non-structural measures, including development of flood forecasting and decision support systems, delivery of communication systems and strengthening flood warning systems, development of a participatory GIS-based flood risk management information system for the public and local governments, advanced planning for flood risks through overlaying flood risk and flood hazard maps to land use plans, assessment of socioeconomic vulnerabilities, constructing field interventions such as river channel cleaning and reinforcement of embankments to reduce vulnerabilities of at-risk communities, and preliminary development of natural disaster insurance primarily for residential stakeholders, as a risk transfer mechanism.

The project was aligned with Objective CCA-3 of the Programming Strategy for the GEF SCCF (2010-2014): “Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology”. The project remains relevant to the SCCF priorities, as the two subsequent SCCF programming strategies, for 2014-2018 and 2018-2022, contain similar technology transfer oriented objectives. The adaptation technology deployed and transferred on the project has provided flood management stakeholders with improved tools to make more informed and timely decisions, enabled more effective coordination across entities and enhanced knowledge of flood risks and hazards and the potential impacts of climate change.

Considering the primary objective of the project was technology transfer, there were commendable advances with respect to policy development, including transposing the EU Flood Directive in the RS. The VRB flood risk management (FRM) plan is another important achievement in terms of a policy tool and planning framework. The government of RS has approved the FRM plan, but the FBiH has elected to wait for the IPA II, EU-funded project to develop flood risk management plans countrywide. Although the VRB is considered an internal river in BiH, it extends across the RS and FBiH entities, and approvals of policies and management plans are handled separately at the entity level. This modality is an administrative reality that is factored into planning and decision making throughout BiH.

The project has contributed towards improved stakeholder involvement among the hydrometeorological institutes and water agencies in the two entities. The project strategy emphasized engagement with the agricultural and energy (hydropower) sectors, which are important stakeholders in the VRB and with respect to water resources management in general in the country. Several climate scenarios were modeled for the agricultural sector and extensive trainings were delivered to VRB extension officials and farmers on agricultural production in the floodplains of the VRB. And, hydropower sector stakeholders have been involved in the development communication protocols for improved flood risk management. The extent of engagement with the hydropower sector will need to increase as the protocols for the FFEWS are further developed and rolled out. As confirmed in the development of the FRM plan, the forestry sector is also an important stakeholder, e.g., due to forest loss in some of the upstream stretches in the VRB, discharges of some of the Vrbas River tributaries are on an increasing trajectory. In fact, the discharge from the Vrbanja Stream has been greater than the main channel of the Vrbas River on some occasions. Forest loss has also led to increased torrential flooding with significant sediment load in the flows due to exposed soils on steep slopes during intense rainfall events. The project made important contributions in the understanding and management of torrential floods, through torrent susceptibility modeling and development of torrent flood risk maps. Considering mountainous nature of many sections of river basins in BiH, these outputs are particularly valuable for flood risk management within the VRB and elsewhere in the country.

Regarding the risk transfer instruments included under Component 3, the project made substantive progress in assessing the local market conditions, surveying willingness to pay and evaluating viable products for BiH. The index-based products envisaged in the project strategy were determined unviable under current socioeconomic circumstances and more pertinent to the agricultural sector than for residential property, which was found to be the

most appropriate segment to focus on. Based on experiences from a natural disaster insurance product introduced in Romania in 2008, a similar, mandatory product is proposed for BiH. The insurance sector, primarily in RS, has been actively engaged in the preparatory work facilitated under the project and remain committed to continue after project closure. Developing the requisite legal framework for the envisaged obligatory natural disaster insurance product will be a key step towards making genuine progress moving forward. The UNDP could provide an important and influential role in the process, bridging the governmental and private sectors and representing the needs of marginalized communities in at-risk areas.

The project has benefited from experienced and efficient project management and a strong project team. Financial delivery has exceeded 90% in each of the four full years reported from 2015 through 2018. Country ownership was found to be good, with high level representation on the project board from national, RS and FBiH stakeholders, and active involvement in the project activities. A total of USD 64.8 million of cofinancing has materialized by 24 December 2019; this is nearly 13 times the value of the USD 5 million GEF project grant. And, nearly USD 0.8 million of cash cofinancing has been contributed by 11 VRB municipalities for 20 non-structural measures completed between August 2017 and September 2019; this figure will increase before project closure as there are a few interventions that will be completed before project closure in March 2020.

The potential for upscaling is high, including through the proposed USD 14 million GCF project “Scaling up climate resilient flood risk management in Bosnia and Herzegovina”, which is expected to be submitted for approval in the first half of 2020. Moreover, the EU remains the main donor in BiH and the EUR 5 million IPA II “Support to Flood Protection and Flood Risk Management” program, running from 2014-2020, includes development of countrywide flood risk management plans, which is the last step in fulfilling requirements stipulated in the EU Flood Directive. The FRM plan developed for the VRB provides valuable guidance for replication across other river basins, and the socioeconomic vulnerability assessment methodology developed on the project will be applied under the GCF project. Other evidence of replication during the project implementation period include adoption of the specifications for hydrometeorological stations for other river basins, including the Bosna River.

RECOMMENDATIONS:

The following recommendations have been formulated based upon the findings of the TE.

No.	Recommendation	Responsible Entities	Timeframe
Corrective actions for the design, implementation, monitoring and evaluation of the project			
1.	Finalize and initiate the implementation of a sustainability plan. One of the recommendations of the midterm review was to develop a sustainability strategy. It would be advisable to complete an action plan according to the strategy and initiate implementation before project closure, e.g., identifying roles and responsibilities, indicating costs and possible sources of funding, recommending champions for follow-up actions, etc.	Project team, project board	Before project closure
2.	Carry out a terminal assessment using the CCA tracking tool for the SCCF programming period of 2018-2022. The suggested sections of the 2018-2022 CCA tracking tool that are relevant to the VRB project include: Core Indicators 1, 2, 3 and 4; Objective 1, Outcome 1.1, Output 1.1.1; and Objective 1, Outcome 1.1, Output 1.1.3.	Project team	Before project closure
3.	Prepare a factsheet on the proposed natural disaster insurance product. A concise and informative factsheet would provide documentary support in advocating for the further development of the insurance coverage.	Project team	Before project closure
4.	Liaise with the “EU 4 Civil Protection Project” regarding results achieved in strengthening capacities of civil protection units. It would be advisable to liaise with the EU 4 Civil Protection project, sharing lessons learned and approaches implemented, and explore possibilities for synergies with the proposed GCF project.	Project team	Before project closure
Actions to follow up or reinforce initial benefits from the project			
5.	Carry out stock-taking and update the FRM plan for the VRB. It would be advisable to carry out a stock-taking exercise of the VRB FRM plan in the next 1-2 years, and update the plan according to any changed circumstances, e.g., completed structural and non-structural measures, and reevaluating the type and costs of short-term and long-term actions; reformulating “urgent” actions to “priority” actions; capturing the operationalized flood forecasting and early warning system; updating information regarding the hydropower sector within the basin; highlighting the importance of the forestry sector; etc.	FRM stakeholders	Within the next 1-2 years

No.	Recommendation	Responsible Entities	Timeframe
6.	Strengthen engagement with the hydropower and forestry sectors for integrated flood risk management. Hydropower and forestry are important sectors in the VRB and it is imperative to better engage these sectors regarding water regulation and land use practices.	FRM stakeholders	Within the next 1-2 years
7.	Develop the requisite legal framework and implement a public information campaign for the proposed natural disaster insurance coverage. In order to realize the envisaged obligatory insurance coverage, developing the requisite legal framework is essential and communicating the concept and coverage to the public should be prioritized.	Multi-stakeholder working group	Within the next 1-2 years
Proposals for future directions underlining main objectives			
8.	Integrate flood risk management with river basin management. Consistent with principles of the EU Flood Directive and the EU Water Framework Directive, flood risk management should be further integrated with river basin management, entailing closer coordination across administrative entities in BiH.	FRM stakeholders in BiH	Within the next 1-2 years
9.	Promote integration of flood risk management priorities into the National Energy and Climate Plan (NECP) for the period of 2021-2030 in order to align with EU energy and climate policies. BiH has recently started working on the NECP and, therefore, the timing is opportune to integrate FRM issues in the early phases in the development of the plan.	FRM stakeholders in BiH	Within the next 1-2 years
10.	Advocate for membership and participation in the Alliance for Hydromet Development²⁰, which brings together major international development, humanitarian and climate finance institutions, collectively committed to scale up and unite efforts to close the hydromet capacity gap by 2030.	Hydromet institutions, UNDP	Within the next 1-2 years

A few examples of good practices and lessons learned regarding project design and implementation are presented below.

GOOD PRACTICES:

Coordination with other projects increases the likelihood that project results will be sustained. The project has done a good job at coordinating with other projects and initiatives, addressing opportunities during each of the project board meetings and facilitating direct cofinancing contributions.

Cash cofinancing from VRB municipalities enhances country ownership and increases the likelihood that project results will be sustained. Substantial cash cofinancing has been contributed by 11 VRB municipalities for cost-sharing in the implementation of non-structural measures. This direct interaction with local governments significantly enhances the level of country ownership on the project and increases the likelihood that project results will be sustained after GEF funding ceases.

Rotating the project board meeting strengthens coordination and collaboration across entities. Considering the VRB extends across the RS and FBiH, rotating the venue of the project board meetings has been a good practice at strengthening coordination and collaboration among entity level stakeholders.

Involvement of the private sector in the conceptualization of natural disaster insurance increases the marketability of the product and contributes towards the objectives of risk transfer. The constructive feedback and interest from the private insurance sector stakeholders has been instrumental in conceptualizing a viable product that has market potential in BiH. In fact, it would have been advisable to have had more in-depth consultation with the insurance sector during the project preparation phase.

LESSONS LEARNED:

The stakeholder involvement plan did not include specific approaches for engagement with the energy (hydropower), agricultural and forestry sectors. The project strategy contains specific objectives regarding the energy (hydropower) and agriculture sector, e.g., integrating climate change considerations in the sector strategies and policies; however, the stakeholder involvement plan did not contain specific approaches on engaging with these sectors, or with forestry sector, which is also an important stakeholder group in the VRB and throughout BiH.

The aim of increasing resilience of highly exposed rural poor, returnee and displaced persons communities in the VRB was not clearly reflected in the evaluation criteria of non-structural measures approved for implementation. The

²⁰ The Alliance was launched at the COP25 climate conference on 10 December 2019.

project developed a comprehensive evaluation matrix for assessing offers for non-structural measures. Flood risk is included among the criteria in the evaluation matrix, but there is not a specific criterion on the risks to highly exposed rural poor, returnee and displaced communities in the VRB – which is the underlying objective of the project.

Gender mainstreaming targets were not fully integrated into the project results framework and not regularly reported on. A gender assessment was included in the project document, but a detailed gender analysis and action plan were not prepared during the project preparation phase, and the project strategy did not fully meet the criteria for a GEN 2 marker characterization. A gender mainstreaming indicator framework was included in the project document; however, it would have been advisable to integrate these gender indicators into the project results framework and to focus the gender metrics on empowerment and equality.

Cost-sharing at the project level. The USD 1.5 million in cash cofinancing from UNDP committed at CEO endorsement was integrated into the total budget and work plan as cost-sharing at the project level. The actual cofinancing that was reported was parallel contributions from complementary projects, which is not cost-sharing at the project level.

It would have been advisable to develop a knowledge management strategy. The project has made important contributions to knowledge associated with flood risk management in the VRB and BiH in general. It would have been advisable to develop a knowledge management strategy, describing roles and responsibilities, cofinancing contributions, ownership of knowledge platforms and systems after GEF funding ceases, etc.

Cofinancing allocations should extend beyond project closure to cover follow-up actions. Allocation of cofinancing contributions should extend beyond the date of project closure, e.g., by 2-3 years, to cover the cost and oversight for follow-up actions.

Annex 1: TE Mission Itinerary

Date	Activity
Monday, 04 November 2019	TE Consultant arrives to Sarajevo
	13:30 Meeting with UNDP, Project manager
	15:00 Meeting with UNDP Country office, Sector leader
	15:30 Meeting with Bosko Kenjic, Head of Water Resources Department, Ministry of Foreign Trade and Economic Relations, BiH, Project board member
	16:30 Meeting with Senad Oprasic, GEF focal point
	Depart for Banja Luka
Tuesday, 05 November	09:00 Meeting with Republika Srpska Hydro-meteo Institute, hydrology department
	11:15 Meeting with Republika Srpska Ministry of Spatial Planning, Civil Engineering and Ecology, UNFCCC focal point, Head of Project Board
	12:00 Marinko Vranic, Republika Srpska Ministry of Agriculture, Forestry and Water Management, Project board member
	13:30 Banja Luka City, Sanja Toljevic, department for communal issues
	14:15, Banja Luka City, Civil Protection
	field visit, non-structural measures in Banja Luka and Laktasi
Wednesday, 06 November	11:00 Meeting with Nedeljko Sudar, Director, Water Institute
	12:15 Meeting with Ozren Djuric, Vode Srpske
	Depart to Tuzla
	15:00 Meeting with CRP, NGO in Tuzla
	15:30 Meeting with prof Kozarevic ref insurance
	Depart for Sarajevo
Thursday 07 November	09:00 Meeting with Bosna Reinsurance
	10:00 Meeting with Suad Skejovic, senior associate for protection from waters, Federal Ministry of Agriculture, Water Management and Forestry, Project board member
	Depart for Bugojno municipality – civil protection
	Return to Sarajevo
Friday, 08 November	09:00 Skype with RTA Nataly Olofinskaya
	10:00 Meeting with Project Manager
	11:00 TE debriefing, presentation of initial findings
	TE Consultant departs Sarajevo

Annex 2: Evaluation Matrix

Evaluation Criteria Questions	Indicators	Sources	Methodology
Relevance: Is the project relevant with respect to the environmental and development priorities at the local, regional and national levels?			
To what extent is the principle of the project in line with national priorities?	Level of participation of the concerned agencies in project activities. Consistency with relevant strategies and policies.	Minutes of meetings, Project progress reports, national and regional strategy and policy documents	Desk review, interviews
To what extent is the project aligned to the main objectives of the GEF focal area?	Consistency with GEF strategic objectives	GEF Strategy documents, PIRs, Tracking Tools	Desk review, interview with UNDP-GEF RTA
To what extent is the project aligned to the strategic objectives of UNDP?	Consistency with UNDP strategic objectives	UNDP Strategic Plan, Country Programme Document	Desk review, interview
Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?			
Assessment of progress made toward achieving the indicator targets agreed upon in the logical results framework			
Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?			
What evidence is available showing sufficient funding has been secured to sustain project results?	Financial risks	Progress reports, sectoral plans, budget allocation reports, testimonial evidence	Desk review, interviews
How have individual and institutional capacities been strengthened, and are governance structures capacitated and in place to sustain project results?	Institutional and individual capacities	Progress reports, testimonial evidence, training records	Desk review, interviews
What social or political risks threaten the sustainability of project results?	Socio-economic risks	Socio-economic studies, macroeconomic information	Desk review, interviews
Which ongoing circumstances and/or activities pose threats to the sustainability of project results?	Risks to sustainability	Sectoral plans, progress reports, macroeconomic information	Desk review, interviews, field visits
Have delays affected project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages?	Impact of project delays	Progress reports	Desk review, interviews
Impact: Are there indications that the project has contributed to, or enabled progress toward long lasting desired changes?			
What verifiable environmental improvements have been made?	Verifiable environmental improvements	Progress reports, sectoral plans, municipal development plans	Desk review, interviews, theory of change analysis
What verifiable reductions in stress on environmental systems have been made?	Verifiable reductions in stress on environmental systems	Progress reports, sectoral plans, municipal development plans	Desk review, interviews, theory of change analysis
How has the project demonstrated progress towards these impact achievements?	Progress toward impact achievements	Progress reports, sectoral plans, municipal development plans	Desk review, interviews, theory of change analysis
Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?			
How was the project efficient with respect to incremental cost criteria?	Incremental cost	National strategies and plans, progress reports	Desk review, interviews

Terminal Evaluation Report

Technology transfer for climate resilient flood management in Vrbas River Basin

GEF Project ID: 5604; UNDP PIMS: 5241

Evaluation Criteria Questions	Indicators	Sources	Methodology
To what extent were the project objective and outcomes realized according to the proposed budget and timeline?	Efficient utilization of project resources	Progress reports, financial records	Desk review, interviews
Country Ownership:			
How are project results contributing to national and subnational development plans and priorities?	Development planning	Government approved plans and policies	Desk review, interviews
Which governments policies or regulatory frameworks were approved in line with the project objective?	Policy reform	Government approved plans and policies	Desk review, interviews
How have governmental and other cofinancing partners maintained their financial commitment to the project?	Committed cofinancing realized	Audit reports, project accounting records	Desk review, interviews
Stakeholder Involvement and Partnership Arrangements:			
How has the project consulted with and made use of the skills, experience, and knowledge of the appropriate government entities, NGOs, community groups, private sector entities, local governments, and academic institutions?	Effective stakeholder involvement	Meeting minutes, reports, interview records	Desk review, interviews, field visits
How were partnership arrangements properly identified and roles and responsibilities negotiated prior to project approval?	Partnership arrangements	Memorandums of understanding, agreements	Desk review, interviews
How have partnerships influenced the effectiveness and efficiency of project implementation?	Effective partnerships	Progress reports, interview records	Desk review, interviews, field visits
How have relevant vulnerable groups and powerful supporters and opponents of the processes been properly involved?	Inclusive stakeholder involvement	Meeting minutes, reports, interview records	Desk review, interviews, field visits
How has the project sought participation from stakeholders in (1) project design, (2) implementation, and (3) monitoring & evaluation?	Stakeholder involvement	Plans, reports	Desk review, interviews, field visits
Catalytic Role:			
How has the project had a catalytic or replication effect in the country?	Catalytic effect	Interview records, municipal development plans	Desk review, interviews
Synergy with Other Projects/Programs			
How were synergies with other projects/programs incorporated in the design and/or implementation of the project?	Collaboration with other projects/programs	Plans, reports, meeting minutes	Desk review, interviews
Preparation and Readiness			
Were project objective and components clear, practicable, and feasible within its time frame?	Project coherence	Logical results framework	Desk review, interviews

Terminal Evaluation Report

Technology transfer for climate resilient flood management in Vrbas River Basin

GEF Project ID: 5604; UNDP PIMS: 5241

Evaluation Criteria Questions	Indicators	Sources	Methodology
How were the capacities of the executing institution(s) and its counterparts properly considered when the project was designed?	Execution capacity	Progress reports, audit results	Desk review, interviews
Were counterpart resources, enabling legislation, and adequate project management arrangements in place at Project entry?	Readiness	Interview records, progress reports	Desk review, interviews, field visits
Financial Planning			
Did the project have the appropriate financial controls, including reporting and planning, that allowed management to make informed decisions regarding the budget and allowed for timely flow of funds?	Financial control	Audit reports, project accounting records	Desk review, interviews
Has there been due diligence in the management of funds and financial audits?	Financial management	Audit reports, project accounting records	Desk review, interviews, field visits
Has promised cofinancing materialized?	Realization of cofinancing	Audit reports, project accounting records	Desk review, interviews
Supervision and Backstopping			
How have GEF agency staff members identified problems in a timely fashion and accurately estimate their seriousness?	Supervision effectiveness	Progress reports	Desk review, interviews
How have GEF agency staff members provided quality support, approved modifications in time, and restructured the project when needed?	Project oversight	Progress reports	Desk review, interviews
How has the implementing agency provided the right staffing levels, continuity, skill mix, and frequency of field visits for the project?	Project backstopping	Progress reports, back-to-office reports, internal appraisals	Desk review, interviews, field visits
Monitoring & Evaluation			
Were intended results (outputs, outcomes) adequately defined, appropriate and stated in measurable terms, and were the results verifiable?	Monitoring and evaluation plan at entry	Project document, inception report	Desk review, interviews
How has the project monitoring & evaluation plan been implemented?	Effective monitoring and evaluation	Progress reports, monitoring reports	Desk review, interviews
How has there been focus on results-based management?	Results based management	Progress reports, monitoring reports	Desk review, interviews
Mainstreaming			
How were gender issues integrated in project design and implementation?	Greater consideration of gender aspects.	Project document, progress reports, monitoring reports	Desk review, interviews, field visits
How were effects on local populations considered in project design and implementation?	Positive or negative effects of the project on local populations.	Project document, progress reports, monitoring reports	Desk review, interviews, field visits

Annex 3: List of People Interviewed

Name	Position	Organization
Senad Oprasic	GEF Focal Operational Point	Ministry of Foreign Trade and Economic Relations
Marinko Vranic	Project board member	Republika Srpska Ministry of Spatial Planning, Construction and Ecology
Bosko Kenjic	Head of Water Resources Department, project board member	Head of Water Resources Department, Ministry of Foreign Trade and Economic Relations, BiH
Darko Borojević	Head of Department of Hydrology, project board member	Republic Hydrometeorological Institute, Ministry of Agriculture, Forestry and Water Management, Republika Srpska
Suad Skejovic	Senior associate for protection from waters, project board member	Federal Ministry of Agriculture, Water Management and Forestry
Mladen Antonic	Senior Associate for the management of water resources	Ministry of Agriculture, Forestry and Water Management, Republika Srpska
Sanja Toljevic	Department for Communal Issues	Banja Luka Municipality
	Civil Protection Unit	Banja Luka City
Nedeljko Sudar	Manager	Institute for Water Management Ltd.
Vujadin Blagojević	Technical Manager	Institute for Water Management Ltd.
Ozren Djuric		Vode Srpska
		Laktasi Municipality
	Civil Protection Unit	Bugojno Municipality
Adi Tanović	Project Officer	CRP
Safet Kozarević	Professor, project consultant (insurance)	University of Tuzla
Anis Hadžialijagić	Reinsurance Director	Bosna Reinsurance Company Limited
Bakir Pilav	Member of Management and CFO	Bosna Reinsurance Company Limited
Sanjin Avdić	Sector Leader, Energy and Environment	UNDP Bosnia and Herzegovina
Nataly Olofinskaya	Regional Technical Advisor	UNDP Regional
Raduška Cupac	Project Manager	UNDP Bosnia and Herzegovina
Margaretta Ayoung	Chief Technical Advisor	International Consultant
Sladjana Bundalo	Project Officer	UNDP Bosnia and Herzegovina
Goran Bosankic	Project Officer/Engineer	UNDP Bosnia and Herzegovina
Jovanka Cetkovic	Project Officer	UNDP Bosnia and Herzegovina
Nemanja Jungić	Field Associate	UNDP Bosnia and Herzegovina

Annex 4: List of Information Reviewed

1. Project documents

- 1) GEF Project Identification Form (PIF)
- 2) GEF Secretariat Review Sheet, STAP Review Sheet
- 3) UNDP Project Document
- 4) GEF CEO Endorsement Request
- 5) UNDP Environmental and Social Screening results
- 6) Project Inception report
- 7) Project Implementation Review (PIR) reports for each year of implementation
- 8) GEF focal area Tracking Tools – AMAT, including baseline and midterm assessments
- 9) Minutes of Project Board meetings
- 10) Midterm review (MTR) and other relevant evaluations and assessments
- 11) Management response to midterm review recommendations
- 12) Annual Work Plans and Budgets
- 13) Financial expenditure reports (Combined Delivery Reports - CDRs) for each year of implementation, broken down by project outcome and project management
- 14) Cofinancing letters reported at midterm and TE
- 15) Cofinancing confirmation letter from Srbac Municipality, 02 July 2019
- 16) List of early warning stations purchased (precipitation stations, hydrological stations)
- 17) Development of Flood Hazard and Flood Risk Maps for the Vrbas River Basin in B&H, March 2017
- 18) Flood hazard and flood risk maps for VRB municipalities
- 19) Flood Risk Management Plan for VRB, expert discussion in English, 21 March 2019
- 20) Summary of completed non-structural measures
- 21) Public call for selection of non-structural projects to reduce the risk of floods in 14 municipalities in the VRB, 13 April 2017
- 22) Minutes of Evaluation of the Project Proposals related to Call for Project Proposals (on non-structural measures), June 2017
- 23) List of communication/warning equipment purchase for Civil Protection Units of VRB municipalities
- 24) Maps showing locations of project interventions
- 25) Minutes of the Meetings of the Insurance Committee
- 26) Conclusions and recommendations from insurance rounds tables held on 21-22 February 2019
- 27) Agro-Forestry Study, VRB, May 2017
- 28) Project training records on agricultural production in the floodplains of the Vrbas River
- 29) Analysis of the vulnerability of women to floods in the VRB, March 2017
- 30) Gender analysis and action plan, flood risk management in Bosnia and Herzegovina, draft 2019

2. UNDP documents

- 31) One United Nations Programme and Common Budgetary Framework, Bosnia Herzegovina, 2015-2019, United Nations Development Assistance Framework (UNDAF)
- 32) Country Programme Document (CPD), 2015-2019

33) National adaptation plans in focus: lessons from Bosnia and Herzegovina, February 2018

34) UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects, 2012

3. GEF documents

35) Revised Programming Strategy on Adaptation to Climate Change (GEF/LDCF.SCCF.9/4/Rev.1, October 19, 2010)

36) Guidelines for GEF Agencies in Conducting Terminal Evaluation for Full-sized Projects, Approved by the GEF IEO Director on 11th of April 2017

4. Other documents

37) Economic Reform Program for 2019-2021 (ERP BiH 2019-2021), January 2019

38) Climate Change Adaptation and Low Emission Development Strategy for Bosnia and Herzegovina, June 2013

39) Third National Communication (TNC) and Second Biennial Update Report on Greenhouse Gas Emissions of Bosnia and Herzegovina, under the UNFCCC, July 2016

40) Strategic Plan for Rural Development of Bosnia and Herzegovina (2018-2021) – Framework Document (unofficial translation)

41) Readiness and Preparatory Support Proposal, Green Climate Fund, Advance the National Adaptation Plan (NAP) process for medium-term investment planning in climate sensitive sectors in Bosnia-Herzegovina (B&H), August 2017

42) Annex to the Commission Implementing Commission, amending Commission Decision C(2014) 9495 of 15.12.2014 adopting the Indicative Strategy Paper for Bosnia and Herzegovina for the period 2014-2020, European Commission, 3.8.2018

43) Tošić, R. et al., 2018. Assessment of Torrential Flood Susceptibility using GIS Matrix Method: Case Study – Vrbas River Basin (B&H), Carpathian Journal of Earth and Environmental Sciences, Vol. 13, No. 2, p. 369-382.

Annex 5: Miscellaneous supporting documentation

Cofinancing letter for the period 2017-2019 issued by Ministry of Agriculture, Forestry and Water Management RS



РЕПУБЛИКА СРПСКА

МИНИСТАРСТВО ПОЉОПРИВРЕДЕ, ШУМАРСТВА И ВОДОПРИВРЕДЕ

Трг Републике Српске 1, Бања Лука, тел:051/338-415, факс: 051/338-865, 338-866, Е-mail: mps@mps.vladars.net

Број: 12.07-337-578/19

Датум, 26-12-2019

United Nations Development Programme
Representation Office Banja Luka
Трг Републике Српске 1/Ц1
78000 Бања Лука

ПРЕДМЕТ: Информација о реализованим улагањима у општине из кредита ЕИБ „Хитне мјере заштите од поплава у РС“, у периоду 2017-2019, доставља се

Поштовани,

Достављамо ва информацију о имплементираним средствима из кредита Европске инвестиционе банке, за период 2017-2019. године.

Ред. Бр.	Пројекат	Општина	Вриједност (КМ)
1	Заштита ријеке Саве - Дубичка Раван	Козарска Дубица	154.314,99
2	Надвишење савског насипа - Домуз скела	Бијељина	102.876,66
3	Надвишење савског насипа	Козарска Дубица	6.728.523,46
4	Изградња мјера заштите од поплава - Усора	Теслић	1.500.000,00
5	Устава Рача	Бијељина	351.891,88
6	Изградња мјера заштите од поплава	Градишка	7.749.256,10
7	Реконструкција канала Дашница	Бијељина	4.627.002,46
8	Реконструкција канала МОК	Бијељина	6.410.507,48
9	Изградња мјера заштите од поплава 1	Србац	637.013,83
10	Изградња мјера заштите од поплава 2	Србац	2.411.313,10
11	Изградња мјера заштите од поплава	Брод	2.349.566,39
УКУПНА ВРИЈЕДНОСТ ПРОЈЕКТА			33.022.266,35

С поштовањем,

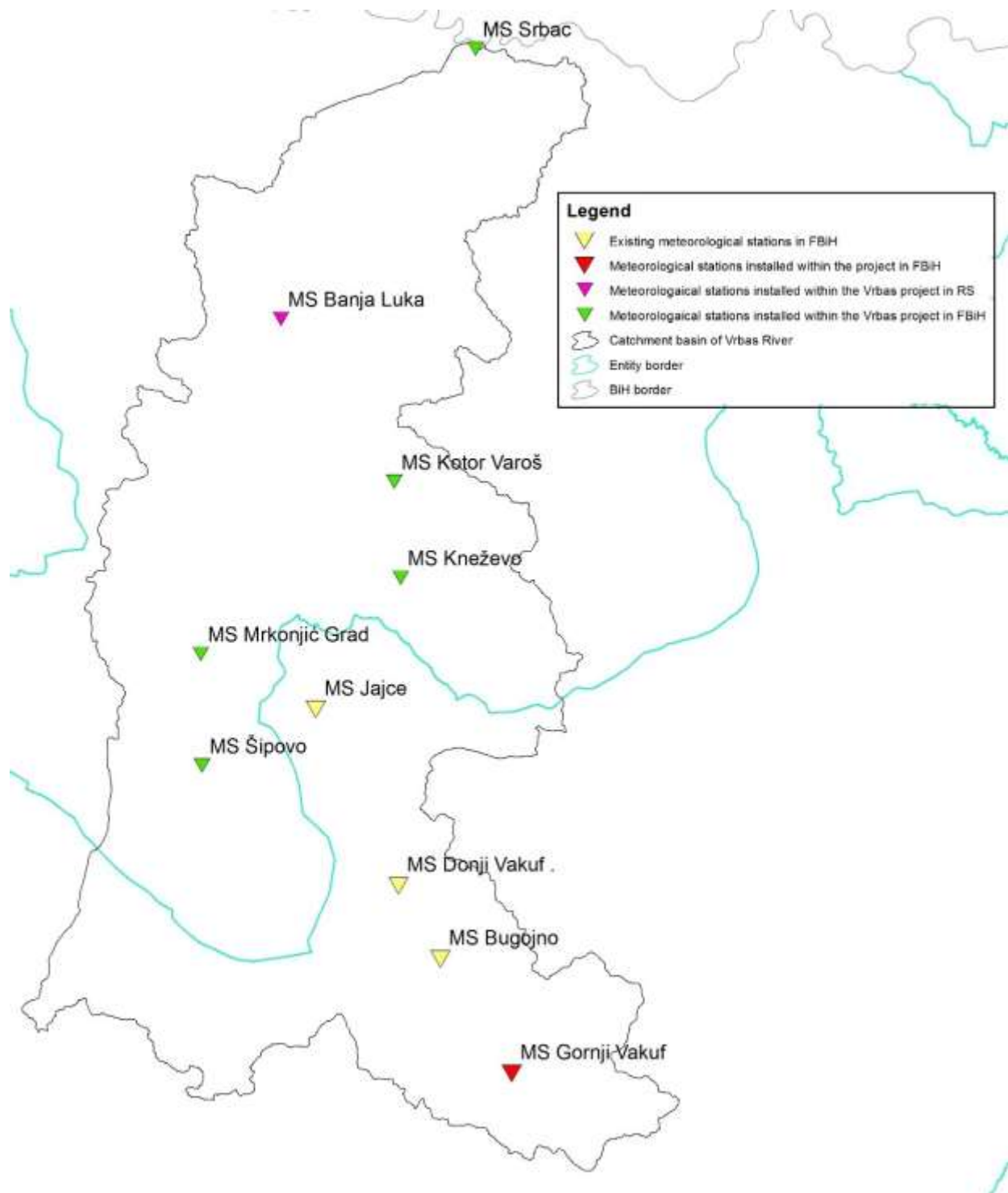
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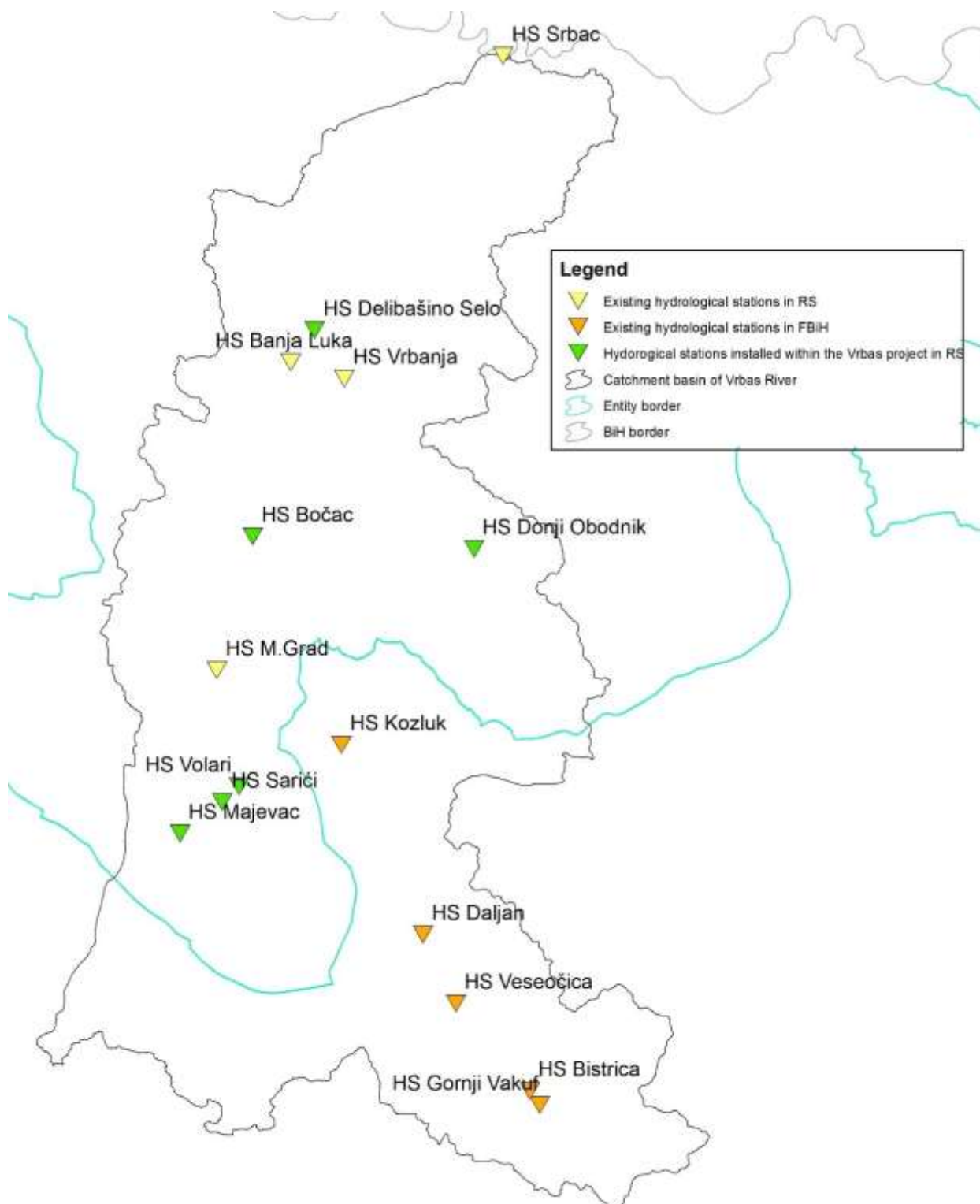
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2. а/а

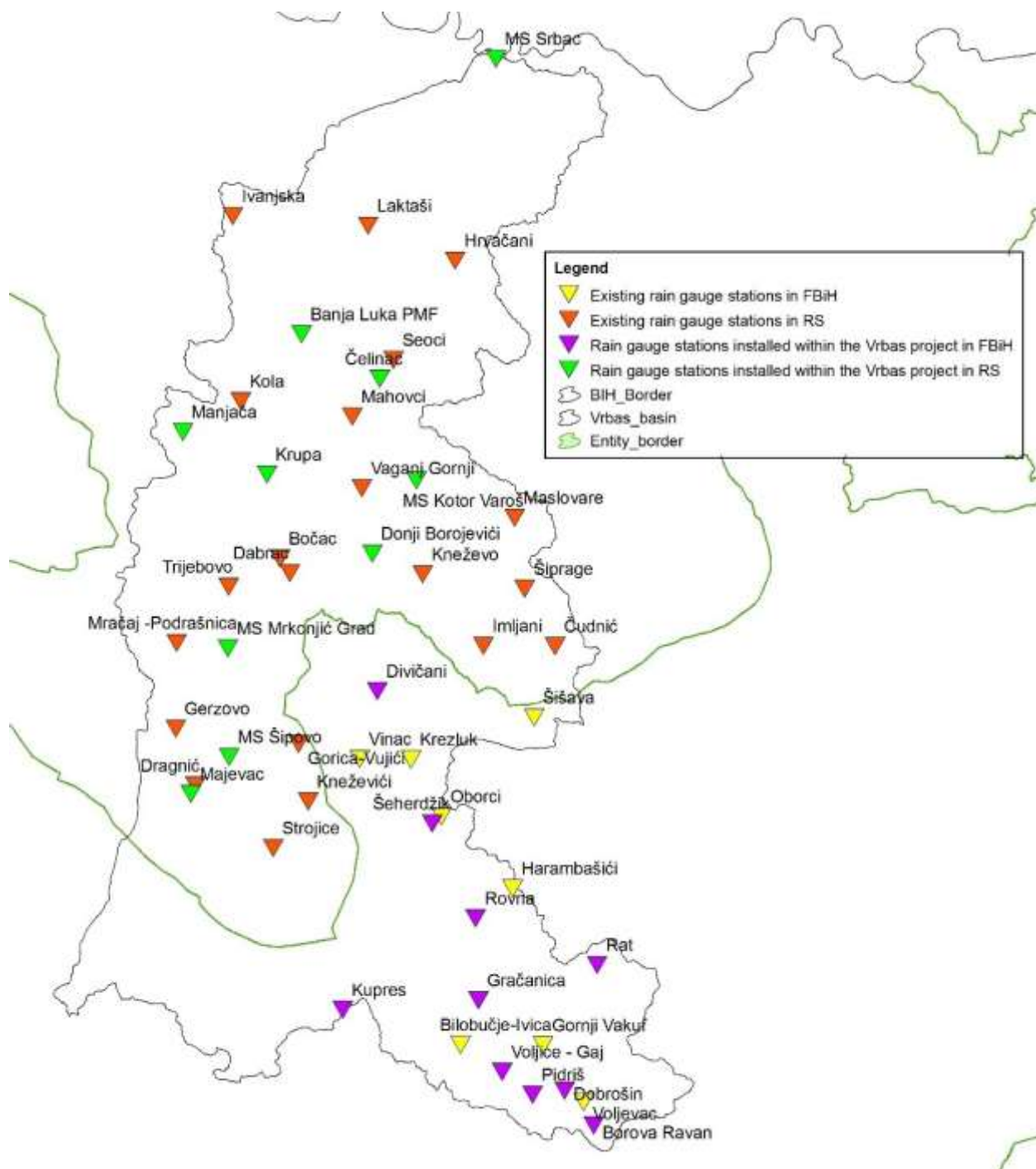
МИНИСТАР
др Борис Пашалић

Hydrometeorological stations purchased with VRB project funds

Location	Latitude	Longitude
Precipitation stations:		
Managed by the RS Hydromet:		
Šipovo	44°17'3.15"N	17° 5'15.92"E
Banja Luka PMF	44°46'44.66"N	17°11'56.34"E
Krupa na Vrbasu	44°36'54.48"N	17° 8'38.16"E
Majevac	44°14'24.86"N	17° 1'33.89"E
Manjača	44°39'47.64"N	17° 0'20.32"E
Kotor Varoš	44°36'34.36"N	17°23'19.13"E
Mrkonjić Grad	44°24'40.14"N	17° 5'0.63"E
Srbac	45° 6'10.42"N	17°30'52.49"E
Kneževo	44°31'27.30"N	17°19'5.81"E
Čelinac	44°44'1.59"N	17°20'50.32"E
Managed by the FBiH Hydromet:		
Šeherdžik	44°12'30.77"	17°25'7.11"
Rovna	44° 5'52.54"	17°29'24.72"
Rat	44° 2'39.17"N	17°41'13.85"E
Gračanica	44° 0'7.18"N	17°29'42.71"E
Kupres	43°59'23.04"N	17°16'34.26"E
Voljice - Gaj	43°55'7.52"N	17°32'3.29"E
Pidriš	43°53'31.57"N	17°35'0.82"E
Borova Ravan	43°51'22.04"N	17°40'59.15"E
Divičani	44°21'44.98"N	17°19'39.86"E
Dobrošin	43°53'49.07"N	17°38'8.56"E
Hydrological station		
Managed by RS Hydromet:		
Delibašino selo	44°48'2.20"N	17°13'32.20"E
Volari	44°17'31.75"N	17° 6'54.90"E
Bočac	44°34'13.30"N	17° 7'57.46"E
Majevac	44°14'20.62"N	17° 1'29.05"E
Sarići	44°16'28.54"N	17° 5'23.27"E
Donji Obodnik	44°33'31.62"N	17°28'37.01"E
Klašnice	44°52'48.95"N	17°17'5.70"E
Automatic Meteorological station		
Managed by the RS Hydromet:		
Banja Luka	44°47'37.79"N	17°12'20.77"E
Managed by the FBiH Hydromet:		
Gornji Vakuf-Uskoplje	43°56'13.58"N	17°34'48.35"E







Annex 6: Matrix of Rating Achievement of Project Objective and Outcomes

Indicator	Baseline	End of Project target	Self-assessment by project team	TE Comments	TE Assessment
Objective: To transfer technologies for climate resilient flood management in order to increase resilience of highly exposed rural poor, returnee and displaced persons communities in Vrbas River Basin				Rating: Satisfactory	
1. Number of new technologies transferred to BiH as part of a methodology for strategic FRM AMAT indicator 3.1.1.1 Type of adaptation technologies transferred to the target groups	Limited institutional capacity and technologies in use for strategic FRM in BiH	At least 5 new technologies introduced (hydrological and hydrodynamic modelling, state-of-the-art monitoring equipment, Flood forecasting and early warning systems, flood damages and losses modelling and vulnerability assessment, and a number of non-structural flood management technologies to BiH)	The Project has introduced 7 new technologies, as follows: 1. Hydro-meteorological network consisting of 7 hydrological, 2 meteorological and 20 rain gauges is operational. 2. Climate change model for Vrbas River Basin has been developed. 3. Hydrological and hydrodynamics models (including 2D model for the whole basin) have been completed. Hydrological modelling included climate change scenarios. 4. Hydrological and hydraulic models for flood forecasting have been completed. Flood forecasting and early warning system has been set with its testing phase starting 01 Aug 2019 5. Vulnerability assessment, including gender segregated data, has been completed. 6. GIS based loss/damage model has been developed for housing, business and agricultural sectors. 7. The first two sets of 21 non-structural measures in 13 municipalities, have been implemented. Currently there are 2 measures which are being implemented (including agro-forestry one).	The project has successfully achieved the end target of introducing at least 5 new technologies for strategic flood risk management.	Achieved
2. VRB (12% of BiH territory) covered by an automated hydrometric monitoring network for effective Flood Forecasting and Early Warning	Hydrometric stations currently cover 50% of the area required for FFEWS for VRB	The VRB (i.e.12% of BiH) covered by a Hydrometric network that provides the optimal coverage required for FFEWS	This target has been fully met. Automated hydrometric monitoring network has been established in Vrbas River Basin, which makes it the first river basin in Bosnia and Herzegovina with a sufficient hydro-meteorological network coverage. Data collection and processing has been centralized and is taking place in hydro-meteorological institutes.	The VRB hydrometric network has been expanded and the hydromet institutes in the two entities FBiH and RS are coordinating in data transfer and flood risk communication.	Achieved
Outcome 1: Key relevant development strategies/policies/legislations integrate climate change resilient flood management approaches				Rating: Satisfactory	
3. AMAT Indicator 3.2.1 Policy environment and regulatory framework for adaptation related technology transfer established or strengthened	1: No policy/regulatory framework for adaptation related technology transfer in place	4: Policy/regulatory framework for adaptation related technology transfer have been formally adopted by the Government but have no enforcement mechanisms	The Project has reviewed existing legislation, policies strategies and plans and identified all sectors of relevance to flood risk. Entry points in the main legislations (law on waters, water management strategies, law on agricultural land, law on spatial planning) for introducing Climate Change considerations have been identified. Amendments to the Law on Waters, transposing EU flood directive have been adopted. Decree containing content and elements of flood risk management has been developed and adopted. Amendments to the Law on Spatial Planning to include flood maps and climate changes have been adopted. Draft flood zoning policy, which includes flood zoning rules, has been developed.	The project has facilitated substantive advances in policy and regulatory frameworks, primarily in RS. Further progress expected under the ongoing EU-funded flood risk management program and the GCF project currently under development.	Mostly Achieved
4. No. of Adaptation technology solutions for climate resilient flood	0: Document codifying standard methodologies and	At least 10 guidance documents produced on	Six guidance documents have been developed: 1. Flood risk modelling and mapping methodology has been developed	The end target has been achieved, with guidance	Achieved

Terminal Evaluation Report

Technology transfer for climate resilient flood management in Vrbas River Basin

GEF Project ID: 5604; UNDP PIMS: 5241

Indicator	Baseline	End of Project target	Self-assessment by project team	TE Comments	TE Assessment
management (CRFRM) enabled for implementation	procedures for Climate resilient flood Risk Management (CRFRM)	Climate Resilient Flood Risk Management topics	and adopted by local institutions. 2. Guidance for the development of a centralized flood forecasting and early warning system has been drafted. 3. Draft operational and maintenance plan for hydrometric stations has been completed. 4. Guidance to use PGIS and geoportal has been developed. 5. Methodology for socio-economic survey to assess and quantify the value of property at the level of settlements within municipalities has been developed. 6. Guidance to develop flood depth/damage curve and loss/damage model have been developed	documents disseminated and institutionalized (e.g., flood forecasting and early warning system).	
Outcome 2: Climate resilient flood risk management is enabled by transferring modern technologies and strengthening institutional capacities				Rating: Highly Satisfactory	
5. AMAT Indicator 3.2.2: Strengthened Capacity to transfer appropriate adaptation technologies ...	1: Very few professional are aware of adaptation technologies	3: High Capacity achieved (>75%). Provision of models, information systems, tools and training in the use of these to professionals, on various aspects of climate adaptation technologies	In addition to initial trainings, professionals from hydro-meteorological institutes and water agencies are undergoing regular on-the-job training in hydrological and hydraulic modelling, water information system, torrents modelling, types of non-structural flood protection options etc. in order to ensure sustainability of the new technologies. Initial trainings in flood forecasting for professionals from hydro-meteorological institutes and water agencies is ongoing. Professionals in hydro-meteorological institutes and water agencies have received trainings on hydrometric monitoring. Geodetic experts have been involved and trained in interpretation of LiDAR survey. Professionals from relevant ministries have been receiving continuous training in water information system (data entry, analysis etc.). Members of civil protection units have been trained on how to use early warning system equipment. So far, more than 150 professionals have been trained in data management, use of water information system, hydrological and hydraulic modelling, torrents modelling, types of non-structural flood protection options and flood forecasting.	Capacity building has been a significant strength of the project, with extensive trainings delivered to water management sector and civil protection sector stakeholders.	Achieved
6. No. of institutions enabled to modify risk management strategies based on introduced vulnerability, loss and damages assessment and improved hydrometric monitoring technologies	Most of the socio-economic information required to assess flood damages, losses, exposure and vulnerability is not currently available and is not collected systematically and gender-disaggregation of data not systematically done.	GIS-based flood damages, losses and vulnerability assessment tool developed for VRB and systematic socio-economic survey methods established and implemented for VRB and introduces sex-disaggregated data collection protocols and methods	End-of-project targets have been met. However, in order for GIS-based tools to become a practice and sustainable in institutions, especially in municipalities, further project engagement with municipal staff is necessary in order for GIS based tools to become an every-day practice. Project Spatial Data infrastructure, in line with the EU INSPIRE directive has been developed. Available data have been collected and digitized. Lidar geodetic survey of flood risk areas, as identified in preliminary flood risk assessment, have been completed. Completed flood hazard and risk maps have been entered in project geoportal. Socio-economic survey in the Vrbas River Basin has been completed with gender disaggregated data and it includes vulnerability assessment for women in flood risk areas in VRB. Torrents susceptibility	GIS-based tools have been developed and successfully disseminated and made available to municipalities and other users.	Achieved

Terminal Evaluation Report

Technology transfer for climate resilient flood management in Vrbas River Basin

GEF Project ID: 5604; UNDP PIMS: 5241

Indicator	Baseline	End of Project target	Self-assessment by project team	TE Comments	TE Assessment
			model has been developed for Vrbas river basin. GIS based loss/damage model has been developed for housing, business and agricultural sectors.		
Outcome 3: New technologies and approaches for enhanced flood risk management applied to increase resilience of vulnerable communities in VRB				Rating: Satisfactory	
7. No. of people in target basin benefitting from FRM adaptation technologies, tools, and adaptation strategies, and are less exposed to flood risk	Current approach limited of inclusion of local communities, and particularly the vulnerable groups	At least 5 technologies transferred to 13 communities in community-based adaptation measures	Five technologies have been transferred to all 13 municipalities in VRB to facilitate implementation of community-based adaptation measures: participatory GIS, flood maps, torrents register, vulnerability assessment, loss/damage curves, while hydrological and hydraulic model, as well as management of water information system has been handed over to hydro-meteorological institutes and water agencies, in line with their legal responsibilities. Implementation of non-structural measures has been completed/ is on-going in 13 municipalities. Participatory GIS, as a means of integrating local community information into the assessments of flood risk, has been developed as part the GIS-based socio-economic tool and introduced to all municipalities in Vrbas river basin. Hydrological and hydraulic (1D and 2D) models for the whole basin have been developed for the purpose of flood mapping. Hydrological models, with climate modelling included, have been transferred to and are being operated by Hydro-meteorological institutes and hydraulic models are handed over to water agencies. Flood hazard and risk maps have been handed over to water agencies and municipalities. Torrents susceptibility model, which includes torrents register and erosion map, has been developed for Vrbas river basin. Hydrological and 1D hydraulic models have been adjusted for the purpose of flood forecasting and early warning system. Flood depth-damage curve has been developed and GIS based loss/damage model has been developed. Water information system restructuring has been completed and a platform for exchange of data among water agencies is functional. Community intervention plans, whose purpose is to improve local preparedness and ability to respond on flood events, have been completed for 13 municipalities in Vrbas river basin.	The end target of transferring at least 5 technologies to 13 municipalities has been achieved.	Achieved

Terminal Evaluation Report

Technology transfer for climate resilient flood management in Vrbas River Basin

GEF Project ID: 5604; UNDP PIMS: 5241

Indicator	Baseline	End of Project target	Self-assessment by project team	TE Comments	TE Assessment
8. No. of innovative Non-structural measures introduced and implemented as part of climate adaptation strategies to provide improved resilience to communities (include agric.)	Current approach to FRM is structural flood protection measures	Non-structural measures designed and implemented in 13 municipalities by 2020	The 21 non-structural measures in 13 municipalities have been identified, of which 18 have been completed and 3 will be finalized by Oct 2019. These measures, which benefited app 60,000 people, treated more than 46 km of river banks and protected app 3,200 ha of agricultural land, included channel cleaning, re-meandering, gabion installation, riverbed cladding, torrential streams management etc. Identification and selection of measures has been based on flood hazard and risk maps and municipal participation. Total value of these investments was 5.12 mil BAM (app USD 2,9 mil) with app 34% co-financing from municipalities. The third set of additional 2 measures focusing on agro-forestry has been identified following the same principle. Agro-forestation scheme which provides concrete solutions for agro-forestry measures in the basin has been completed.	Non-structural measures have reduced vulnerabilities in 13 municipalities, with substantial cofinancing from local governments.	Achieved
		At least 4,200 hectares of agric. land protected by non-structural measures (e.g. floodplain agro-forestry to be implemented on at least 840 hectares)		One of the non-structural measures entails protecting riverbank ecosystems with an agroforestry management system. Implementation was underway at the time of the TE mission in early November and completed later that month.	Mostly Achieved
9. No. of communities benefitting from introduced forecasting, early warning, response and recovery technologies to support local communities at risk of flooding	FFEWS system currently disjointed and not fully electronically based	Fully integrated Flood forecasting and Early warning system implemented in VRB	This target has almost been met. Set up for FF EWS has been completed. Hydro-meteorological network in Vrbas River Basin has been established and real-time data transfer is enabled. Hydrological and hydraulic model for flood forecasting have been completed. Platform for flood forecasting and early warning system has been finalized. Flood forecasting has also included spatial component i.e. potential flood borders. Development of the FF EWS has been co-financed by two water agencies in the amount of BAM 150.000 (app USD 90,000 i.e. 35% of the total value). FF EWS test phase is to start on 01 Aug 2019. Development of Protocol on data flow and issuance of warning information is in progress. Water agencies have agreed to use that platform for other three basins with similar geographical features: Bosna, Una-Sana and Drina.	The FFEWS has been set up and protocols were under development at the time of the TE mission in November 2019. The protocols were operationalized in Feb 2020. Adaptive management will be required in the implementation of the system, making adjustments as experience is gained and new information is generated.	Achieved

Terminal Evaluation Report

Technology transfer for climate resilient flood management in Vrbas River Basin

GEF Project ID: 5604; UNDP PIMS: 5241

Annex 7: Cofinancing Table

Note	Cofinancing Source	Type	GEF Agency (USD)		Government (USD)		Other (USD)		Total Cofinancing (USD)	
			Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
GEF Agency:										
1	United Nations Development Programme	Cash	1,500,000	1,500,731					1,500,000	1,500,731
2	United Nations Development Programme	In-kind	60,000	60,000					60,000	60,000
	Sub-total, UNDP		1,560,000	1,560,731					1,560,000	1,560,731
Government:										
3	National Government (Ministry of Agriculture, Forestry and Water Management of RS)	Cash			75,000,000	61,668,856			75,000,000	61,668,856
4	Sava River Watershed Agency of FBiH (investments 2014-2017)	Cash			700,000	717,953			700,000	717,953
5	Sava River Watershed Agency of FBiH (FFEWS)	Cash			0	45,455			0	45,455
6	Vode Srpske (FFEWS)	Cash			0	47,348			0	47,348
7	Subnational Government (VRB Municipalities)	Cash			0	791,566			0	791,566
	Sub-total, Government				75,700,000	63,271,178			75,700,000	63,271,178
Other										
	Sub-total, Other:									
Total cofinancing for project implementation:			1,560,000	1,560,731	75,700,000	63,271,178			77,260,000	64,831,910
Note:										
1	Information included in letter issued by UNDP on 22 June 2018, as part of the midterm review (MTR).									
2	Information included in letter issued by UNDP on 22 June 2018, as part of the midterm review (MTR).									
3	Information included in letter issued by Ministry of Agriculture, Forestry and Water Management RS on 19 April 2018, as part of the midterm review. Cofinancing contributions from investments in VRB municipalities from the EIB facility Emergency Flood Relief and Prevention RS in the period 2014-2017. Cumulative investments: BAM 67,913,932.19 (approx. USD 42,952,782; exch. 1.58113) over the period of 2014-2017, and BAM 33,022,266.35 (approx. USD 18,716,073.83; exch. 1.76438 over the period of 2017-2019.									
4	Information included in letter issued by the Sava River Watershed Agency on 16 April 2018, as part of the midterm review. Cofinancing contributions reflect investments in 2014-2017.									
5	Additional cofinancing from Sava River Watershed Agency, specifically as a contribution towards cost of Flood Forecasting and Early Warning System (FFEWS).									
6	Cofinancing from Vode Srpske, specifically as a contribution towards cost of Flood Forecasting and Early Warning System (FFEWS).									
7	Direct cofinancing contributions from VRB municipalities for the implemented non-structural measures in 2017, 2018 and 2019 (Jan-Sep). Source: UNDP combined delivery reports (CDRs).									

Annex 8: Evaluation Consultant Code of Conduct Agreement Form

Evaluators / Consultants:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and: respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/ or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

TE Consultant Agreement Form

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: James Lenoci

We confirm that we have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signature:

Budapest, 17 September 2019



James Lenoci, TE Consultant

Annex 9: Rating Scales

Outcome Ratings

The overall ratings on the outcomes of the project are based on performance on the following criteria:

- a. Relevance
- b. Effectiveness
- c. Efficiency

Project outcomes are rated based on the extent to which project objectives were achieved. A six-point rating scale is used to assess overall outcomes:

- Highly satisfactory (HS): Level of outcomes achieved clearly exceeds expectations and/or there were no short comings.
- Satisfactory (S): Level of outcomes achieved was as expected and/or there were no or minor short comings.
- Moderately Satisfactory (MS): Level of outcomes achieved more or less as expected and/or there were moderate short comings.
- Moderately Unsatisfactory (MU): Level of outcomes achieved somewhat lower than expected and/or there were significant shortcomings.
- Unsatisfactory (U): Level of outcomes achieved substantially lower than expected and/or there were major short comings.
- Highly Unsatisfactory (HU): Only a negligible level of outcomes achieved and/or there were severe short comings.
- Unable to Assess (UA): The available information does not allow an assessment of the level of outcome achievements.

The calculation of the overall outcomes rating of projects considers all the three criteria, of which relevance and effectiveness are critical. The rating on relevance determines whether the overall outcome rating will be in the unsatisfactory range (MU to HU = unsatisfactory range). If the relevance rating is in the unsatisfactory range then the overall outcome is in the unsatisfactory range as well. However, where the relevance rating is in the satisfactory range (HS to MS), the overall outcome rating could, depending on its effectiveness and efficiency rating, be either in the satisfactory range or in the unsatisfactory range.

The second constraint applied is that the overall outcome achievement rating may not be higher than the effectiveness rating.

During project implementation, the results framework of some projects may have been modified. In cases where modifications in the project impact, outcomes and outputs have not scaled down their overall scope, the evaluator should assess outcome achievements based on the revised results framework. In instances where the scope of the project objectives and outcomes has been scaled down, the magnitude of and necessity for downscaling is taken into account and despite achievement of results as per the revised results framework, where appropriate, a lower outcome effectiveness rating may be given.

Sustainability Ratings

The sustainability is assessed taking into account the risks related to financial, sociopolitical, institutional, and environmental sustainability of project outcomes. The evaluator may also take other risks into account that may affect sustainability. The overall sustainability is assessed using a four-point scale.

- Likely (L). There is little or no risks to sustainability.
- Moderately Likely (ML). There are moderate risks to sustainability.
- Moderately Unlikely (MU). There are significant risks to sustainability.
- Unlikely (U). There are severe risks to sustainability.
- Unable to Assess (UA). Unable to assess the expected incidence and magnitude of risks to sustainability.

Project M&E Ratings

Quality of project M&E is assessed in terms of:

- Design
- Implementation

Quality of M&E on these two dimensions is assessed on a six point scale:

- Highly satisfactory (HS): There were no short comings and quality of M&E design / implementation exceeded expectations.
- Satisfactory (S): There were no or minor short comings and quality of M&E design / implementation meets expectations.
- Moderately Satisfactory (MS): There were some short comings and quality of M&E design/implementation more or less meets expectations.
- Moderately Unsatisfactory (MU): There were significant shortcomings and quality of M&E design / implementation somewhat lower than expected.
- Unsatisfactory (U): There were major short comings and quality of M&E design/implementation substantially lower than expected.
- Highly Unsatisfactory (HU): There were severe short comings in M&E design/ implementation.
- Unable to Assess (UA): The available information does not allow an assessment of the quality of M&E design / implementation.

Implementation and Execution Rating

Quality of implementation and of execution is rated separately. Quality of implementation pertains to the role and responsibilities discharged by the GEF Agencies that have direct access to GEF resources. Quality of Execution pertains to the roles and responsibilities discharged by the country or regional counterparts that received GEF funds from the GEF Agencies and executed the funded activities on ground. The performance is rated on a six-point scale.

- Highly satisfactory (HS): There were no short comings and quality of implementation / execution exceeded expectations.
- Satisfactory (S): There were no or minor short comings and quality of implementation / execution meets expectations.
- Moderately Satisfactory (MS): There were some short comings and quality of implementation / execution more or less meets expectations.
- Moderately Unsatisfactory (MU): There were significant shortcomings and quality of implementation / execution somewhat lower than expected.
- Unsatisfactory (U): There were major short comings and quality of implementation / execution substantially lower than expected.
- Highly Unsatisfactory (HU): There were severe short comings in quality of implementation / execution.
- Unable to Assess (UA): The available information does not allow an assessment of the quality of implementation / execution.

Annex 10: Terms of Reference for Terminal Evaluation

Annex 11: Signed TE Final Report Clearance Form

Terminal Evaluation Report Reviewed and Cleared By:	
UNDP Country Office	
Name:	
Signature:	Date:
UNDP GEF Regional Technical Advisor	
Name:	
Signature:	Date: