



# PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND:SCCF

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## PART I: PROJECT INFORMATION

Project Title:	Technology transfer for climate resilient flood management in Vrbas River Basin		
Country(ies):	Bosnia and Herzegovina	GEF Project ID: <sup>1</sup>	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
Name of parent program (if applicable):	N/A	Project Agency Fee (\$):	475,000
<ul style="list-style-type: none"> <li>For SFM/REDD+ <input type="checkbox"/></li> <li>For SGP <input type="checkbox"/></li> <li>For PPP <input type="checkbox"/></li> </ul>			

### A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK<sup>2</sup>:

Focal Area Objectives	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-financing (\$)
CCA-3: Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology	SCCF	5,000,000	12,540,000
(select) (select)	(select)		
Total Project Cost		5,000,000	12,540,000

### B. INDICATIVE PROJECT DESCRIPTION SUMMARY

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	Grant Type <sup>3</sup>	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Cofinancing (\$)
1. Enabling environment for climate risk sensitive water and flood management	TA	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.	SCCF	655,000	1,000,000
2. Technical and institutional capacity for transferring	TA	2. Climate resilient flood risk management is enabled by	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	SCCF	1,315,000	2,000,000

<sup>1</sup> Project ID number will be assigned by GEFSEC.

<sup>2</sup> Refer to the reference attached on the [Focal Area Results Framework and LDCF/SCCF Framework](#) when completing Table A.

<sup>3</sup> TA includes capacity building, and research and development.

climate resilient flood management technologies and approaches		transferring modern technologies and strengthening institutional capacities	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;			
	Inv		2.3. Hydro-meteorological monitoring system in the VRB upgraded (increased from 11 to 25 gauging stations) and harmonized into a central hydrometric system;			
	TA		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	TA/Inv	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;	SCCF	2,780,000	9,500,000
	Inv		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);			
	TA		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 13communities 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.			
Subtotal					4,750,000	12,500,000
Project Management Cost (PMC) <sup>4</sup>				SCCF	250,000	40,000
Total Project Cost					5,000,000	12,540,000

<sup>4</sup> To be calculated as percent of subtotal.

**C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)**

Sources of Cofinancing	Name of Cofinancier	Type of Cofinancing	Amount (\$)
Multi-lateral agency	UNDP	Cash	1,500,000
Multi-lateral agency	UNDP	In-kind	40,000
National Government	Ministry of Agriculture, Forestry and Water Management of Republica Srpska; Ministry of Agriculture, Forestry and Water Management of Federation of BiH, Public Institution "Vode Srpske" and Federal Water Agency	Cash	3,000,000
Investment Bank	EIB	Cash	8,000,000
<b>Total Cofinancing</b>			<b>12,540,000</b>

**D. INDICATIVE TRUST FUND RESOURCES (\$) REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY<sup>1</sup>**

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount (\$) (a)	Agency Fee (\$) (b) <sup>2</sup>	Total (\$) c=a+b
UNDP	SCCF	Climate Change	Bosnia and Herzegovina	5,000,000	475,000	5,475,000
<b>Total Grant Resources</b>				<b>5,000,000</b>	<b>475,000</b>	<b>5,475,000</b>

<sup>1</sup> In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for

this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

<sup>2</sup> Indicate fees related to this project.

**E. PROJECT PREPARATION GRANT (PPG)<sup>5</sup>**

Please check on the appropriate box for PPG as needed for the project according to the GEF Project Grant:

	<u>Amount Requested (\$)</u>	<u>Agency Fee for PPG (\$) <sup>6</sup></u>
• No PPG required.	<u>-- 0--</u>	<u>--0--</u>
• (upto) \$50k for projects up to & including \$1 million	<u>                    </u>	<u>                    </u>
• (upto)\$100k for projects up to & including \$3 million	<u>                    </u>	<u>                    </u>
• (upto)\$150k for projects up to & including \$6 million	<u>150,000</u>	<u>14,250</u>
• (upto)\$200k for projects up to & including \$10 million	<u>                    </u>	<u>                    </u>
• (upto)\$300k for projects above \$10 million	<u>                    </u>	<u>                    </u>

**PPG AMOUNT REQUESTED BY AGENCY(IES), FOCAL AREA(S) AND COUNTRY(IES) FOR MFA AND/OR MTF PROJECT ONLY**

Trust Fund	GEF Agency	Focal Area	Country Name/Global	(in \$)		
				PPG (a)	Agency Fee (b)	Total c = a + b
(select)	(select)	(select)				0
(select)	(select)	(select)				0
<b>Total PPG Amount</b>				<b>0</b>	<b>0</b>	<b>0</b>

MFA: Multi-focal area projects; MTF: Multi-Trust Fund projects.

<sup>5</sup> On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

<sup>6</sup> PPG fee percentage follows the percentage of the GEF Project Grant amount requested.

## **PART II: PROJECT JUSTIFICATION**

### **PROJECT OVERVIEW**

#### **A.1. Project Description.**

#### **Problem description**

1. 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.
2. 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. According to the 2010 multi-dimensional Poverty Index introduced in the 2010 Human Development Report, it is estimated that in BiH 14.0 % of the population lives below the official poverty line, and worse yet, the intensity of deprivation amongst the poor is 37.2 %. 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<sup>7</sup>. For example, in 2010 Bosnia and Herzegovina experienced flood damages of USD\$ 200 million which is approximately 1% of GDP.
3. The most damaging floods have had devastating impacts on the most vulnerable groups including the rural poor, war returnees and displaced persons. Based on indicative information from local authorities, a significant proportion of the flood victims belong to one of these vulnerable groups. For example, in several municipalities in the Vrbas basin up to 100% of affected households have been identified as war returnees or displaced persons and are least well equipped to cope with, and recover from floods<sup>8</sup>. This has led to a deepening of poverty in flood affected areas.
4. 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 risks.<sup>9</sup>
5. 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. According to the Localized Climate Models developed for BiH through the SNC<sup>10</sup>, the mean seasonal temperature changes for the period 2001-2030 are expected to range from +0.8°C to +1.0°C above the previous average temperatures, and further significant temperature increases are expected during the period 2031-2060, of between 1° C to 2° C in coastal areas, and 2° C to 3° C inland. Observed historical records show an increase of 1.2°C for the period 1961-2010, in line with predictions. The INC and SNC also predict that precipitation will decrease by 10% in the west of the country and increase by 5% in the east in the period 2001 to 2030. Rainfall extremes are also increasing and there are changes in the seasonality of rainfall with decreased precipitation during the spring and summer months (20%), and increased precipitation in the autumn months. The historical records show that the number of days with rainfall above 10.0 mm has increased, which indicates increasing intensity of rainfall. These observations represent a change to the rainfall regime which, when

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<sup>7</sup> 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>

<sup>8</sup> It should be noted that there is very little statistical data on the number of returnee and displaced persons, who, by the very nature of their situation have been difficult to keep a record of. One benefit of this project will be specific assessment of vulnerability of these groups to climate change within the Vrbas basin.

<sup>9</sup> Risk assessment of vulnerability BiH to natural and other disasters, Ministry of security of BiH.

<sup>10</sup> Second National Communication of Bosnia and Herzegovina to the UNFCCC (SNC), 2013

combined with temperature increases, will result in less moisture in the soil (potentially increasing the frequency and magnitude of drought), and an increased likelihood of floods as the frequency of intense rain events increases. All of these impacts have been observed in the project target area – the Vrbas Basin – but the most damaging has been flooding.

### **The Target River Basin – Characteristics contributing to exposure and vulnerability**

6. The Vrbas River is a right tributary of the Sava River, which is in turn a right tributary of the Danube River, the second largest river basin by area in Europe. The total land area of the Vrbas Basin is about 6,300 km<sup>2</sup>, of which 63% lies within the entity of Republika Srpska (RS) and 37% within the Federation of Bosnia and Herzegovina (FBiH).
7. The Vrbas Basin is typified by mountainous relief, accounting for 90% of land area mainly located in the upper and middle sections. The remaining 10% of a lower, more mature river plain mainly located at Lijevče Polje and the Skopaljska Valley. The Vrbas Basin experiences floods in the spring (March - May) as a result of snow melt and late autumn (December) due to heavier rainfall. The lower part of the Vrbas River - from the confluence with the Sava River upstream to the bridge at Klačnice meanders and there is significant river bank erosion and deposition.
8. In the Vrbas River Basin (VRB), the climate change trends described above have already been observed and 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 years<sup>11</sup> 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). This is noted also in the analyses performed in World Bank's *Update the Basis of the Water Resources Management of the Vrbas River Basin*<sup>12</sup>, which showed 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.
9. There are two significant hydropower dams on the Vrbas River –the Jajce I and II. These hydropower dams regulate flow on the Vrbas and will therefore play a part in flood risk management. Under climate change hydropower dams will be affected by both droughts (due to increased temperatures and hence evaporation losses, and decreased summer precipitation), and floods, both of which will affect power generation. Prior experience has shown that droughts have contributed to reductions in the production of hydro-electric power. On the other hand, more frequent, intense rain events will lead to intensive runoff and increased peak river flows, when power production may not be possible due to potential (or actual) damage to infrastructure. The increased magnitude and seasonal variability of flood flows could also potentially place dams at risk of overtopping which could lead to dam breaks and catastrophic flooding. With increasingly variable river discharge predicted under climate change, there may be significant challenges for the hydropower sector which needs to be addressed through improved management of water resources at the watershed level. The risks associated with climate change have not yet been systematically considered in strategies and management plans for hydropower development.

### **Vulnerability of Vrbas River Basin communities**

10. 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.
11. The population of the Vrbas is approximately 510,000 (based on 1991 figures). Economic activity in Vrbas basin includes forestry products, agriculture, food, textiles and leather products, mining, metallurgy and metal processing, chemical processing and electrical industry. Nationally, the unemployment rate in

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<sup>11</sup> Data on flood damages collected from Vrbas River Basin Municipalities, UNDP 2013

<sup>12</sup> Update the Basis of the Water Resources Management of the Vrbas River Basin, World Bank, February 2012

BiH is at 44%. In Vrbas basin the percentage of unemployed ranges from 30% to 86% (65% on average) in affected areas and the percentage of returnees affected is up to 100%.

12. The majority of the population (approx. 65%) living in the flooded areas of VRB is rural, which in Bosnia and Herzegovina is on average much poorer than urban population and 17% are returnees or displaced persons who are among the poorest in BiH. UNDP's Household Budget Survey in 2007 found that 23.9 % of rural households were poor, compared to only 11.0 % of urban households. Overall, per capita GDP in rural areas averages 4,780 KM (USD 3,186), which is 43% lower than the urban value of 8,360 KM (USD 5,573). The Rural Household Survey (2012) found that the average total household income in rural areas of BiH was 767 KM (USD 520) per month, which, when compared to the minimum monthly income requirement for a family of 3.4 (1,100 to 14,00 KM (USD 680-950) suggests the rural population is living on edge or in poverty. Furthermore, there is a large proportion of rural households, almost 25%, earning only 200-400 KM (USD 133 - 267) per month. Indeed, almost 90 % of the rural households in the survey declared a monthly income below the calculated "family consumption basket" of 1,370 KM (USD 913). That said, it still appears that a lot of rural households are living in or near poverty, and the only way for them to secure subsistence and partially compensate for the income lower than the minimum required to stay out of poverty are the savings created through their own small scale, subsistence farming.
13. Around a third of the rural population of Vrbas Basin (approximately 100,300 people) manage "smallholdings" where they produce fruit, vegetables and livestock products mainly for their own consumption, and about 16 % may be classified as "farmers", in that they manage at least 3 ha and/or 3 livestock units. Agriculture is therefore important to the Vrbas River Basin, and the direct impacts of climate change on agriculture such as floods and droughts will inevitably impact the rural communities. Under climate change there is a real risk of reduced crop yields leading to increased food prices, which would in turn have negative implications for food security.<sup>13</sup> The year 2012 represented the fourth consecutive year when agriculture suffered significant losses due to bad weather. The agricultural damages due to flooding for the last 10 years has been estimated at US\$545,000 in Vrbas basin. Agricultural damages from droughts and floods have serious implications for the poor and vulnerable, as it negatively impacts on households and household budgets. The impacts are experienced differently by men and women, due to their gender-based responsibilities in household management. Hence, adaptation approaches will need to focus on flood risk management which, while addressing flood risk, will not exacerbate drought risk, and if possible will provide attendant benefits to drought risk management. Importantly, adaptation measures should also take account of the different vulnerabilities of men and women.
14. Empirical evidence, based on reports of all 13 municipalities of the VRB to UNDP, shows clearly that all of the municipalities have over the last 10 years, experienced major flooding which resulted in damages estimated at over USD 31 million. The floods have over the period affected directly five of the area's biggest urban centres, over 130 rural communities and villages flooding 9,368 households, 150 social buildings, and 84 businesses. Over the last 10 years, several of the municipalities have reported direct flood damages in range of 40-100% of their annual budgets, while there were cases when the damages exceeded municipal budgets several times (e.g. Municipality of Jajce, damage from floods in March 2004 was 2.45 times bigger than that year's municipal budget; Municipality Kotor Varos, floods in June 2006 resulted in damage 3.4 times bigger than the municipality's budget). In 2004, approximately 2,300 households within 7 municipalities in the Vrbas river basin were affected by flooding, which resulted in approximately USD 12 million in total damages. In December 2010 Bosnia and Herzegovina experienced the largest amount of precipitation recorded in the last 100 years, which resulted in extensive flooding across large areas of the territory. In the Vrbas basin, this flood event affected 4,914 households and buildings, and resulted in USD 13.6 million in damages.
15. A preliminary field research of UNDP BiH, conducted through questionnaires and interviews with the stakeholders in the VRB identified several flooding "hot spots", which are very illustrative of the situation

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<sup>13</sup> Trbic, G., Vojinovic, DG., 'Impact of Climate Change for Food Production in the Western Balkan Region: Study of impacts of climate change for food production in Bosnia and Herzegovina', REC Country Office Bosnia and Herzegovina, 2010. Research has demonstrated that the recent droughts caused a significant reduction in maize yields in Bosnia and Herzegovina.

in the areas and the problems facing the rural population of VRB. Table 1 below shows that the three worst affected municipalities were Laktasi, Gornji Vakuf-Uskoplje and Bugo in terms of the numbers of households affected, while KotoVaroj sustained the largest damages.

**TABLE 1: FLOOD DAMAGES FOR THE PERIOD 2003-2013**

FLOOD DATE (month / year)	Total number of households affected by flood	Social structure of damaged households				Intervention costs of the municipalities during flooding and reconstruction (USD)	DAMAGES TOTAL (USD)	Average damage as of municipal budget per flooding event (%)
		The percentage of unemployed people in the affected area (%)	Returnees / IDPs / Refugees	Small agricultural producers	Other social categories			
SRBAC	-	-	-	-	-		\$2,000,000	more than 100%
BANJA LUKA	-	-	-	-	-		\$2,896,415	5%
LAKTASI	1,213	35	676	544	515	63,243	\$1,353,029	20%
MRKONJIĆ GRAD	52	86	1	14	-	-	\$573,333	15%
BUGOJNO	430	-	56	314	116	-	\$1,848,947	-
DONJI VAKUF	163	60	1	110	-	78,039	\$389,776	10%
GORNJI VAKUF - USKOPLJE	736	50	1	100-130	-	108,576	\$3,986,837	70%
KOTOR VAROŠ	380	-	-	21	-	3,664	\$6,157,784	185%
JAJCE	250	65	-	187	-	157,435	\$8,751,536	75%
KNEŽEVO	-	-	-	-	-	-	\$302,803	10%
ČELINAC	-	-	-	-	-	-	\$3,064,273	35%
<b>Total</b>							<b>\$31,324,733</b>	

16. In all of the municipalities reviewed, the level of compensation paid against the estimated damages to the flood-affected families and businesses is below 10%. Most of it is paid by municipalities in the form of immediate emergency response and relief, and later repairs of roads, bridges and other damaged social infrastructure while practically the financial support from cantonal, entities and state authorities is almost nonexistent.
17. 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. All of these negative consequences have direct negative effect on livelihood of the individual households and people of the VRB area. The negative effects on livelihood are manifested either directly, 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.
18. In all municipalities, the exposure and vulnerability of the communities described above is further exacerbated by the uncontrolled and unplanned development on the floodplain and other adverse land use practices that affect flooding such as uncontrolled mining of aggregates from river beds and banks, and inappropriate and unsustainable agricultural activity on at risk land. This is mainly due to the lack of land use legislation and policies for the protection against flood risk.
19. The dependence of the area's rural population on the individual small scale subsistence agricultural production, exacerbated by non-resilient and un-sustainable farming practices, coupled with the lack of knowledge and funds to adopt new climate resilient farming techniques increases the exposure of the rural

population of the Vrbas Basin to the effects of climate change which will result in increased agricultural damages in the future.

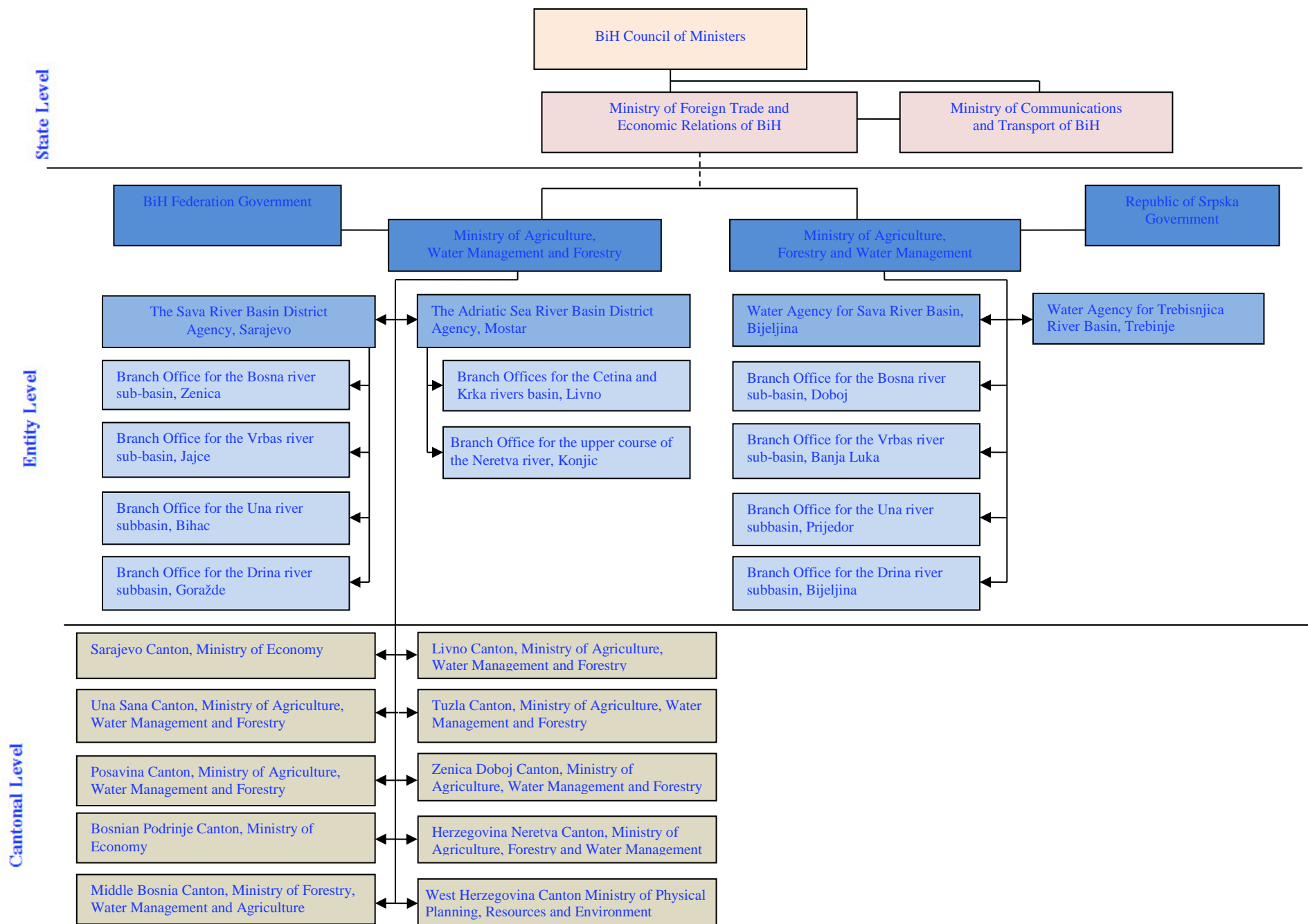
20. Considering all of the above, it is likely that repeated floods in VRB will increase vulnerability of the socially excluded groups and increase the risk of the rural population falling back to poverty. During the project preparation stage, more detailed surveys will be undertaken, to fully define vulnerability of the VRB basin and to ensure that the climate resilient flood management measures take full account of the vulnerability.

### **Existing legislative, policy and institutional framework related to water and flood risk management in BiH**

21. Bosnia and Herzegovina is politically decentralized and comprises two governing Entities, the Federation of Bosnia and Herzegovina and the Republika Srpska, with Brčko District as a de facto third entity. The State of Bosnia and Herzegovina is the central authority, but has only limited and specific powers with regard to the water sector and environmental protection: the Ministry of Foreign Trade and Economic Relations (MoFTER) has water-related competencies at the level of Bosnia and Herzegovina. Due to the lack of a State-level framework and the constitutional character of BiH and its entities, the current state of affairs is complex and heterogenic, especially as the responsibilities for water management rest with the entities. An analysis of the BiH constitutional and legal framework indicates that it does not contain specific and clear principles that should guide the constitutive elements of the State in their management of shared water resources (i.e. those intersected by entity or district borders). The State-level authorities therefore have no responsibility for regulating these inter-entity relations.
22. The legal framework is not unified across the country. There are certain discrepancies between Entities (FBiH and RS) and even among Cantons within FBiH. The level of coordination and cooperation is not as high as it should be. The two Entities and the Brčko District have relevant political, administrative and legal jurisdiction in their own territories. Furthermore, the Federation of Bosnia and Herzegovina is divided into 10 Cantons which have their own authorities (ministries) with responsibilities in the water sector, including adoption of their own relevant laws. This complex administrative structure results in a number of different institutions in charge of water management issues and increases the need for coordination at the national level. The reform of the water sector has led to the adoption of new water legislation.

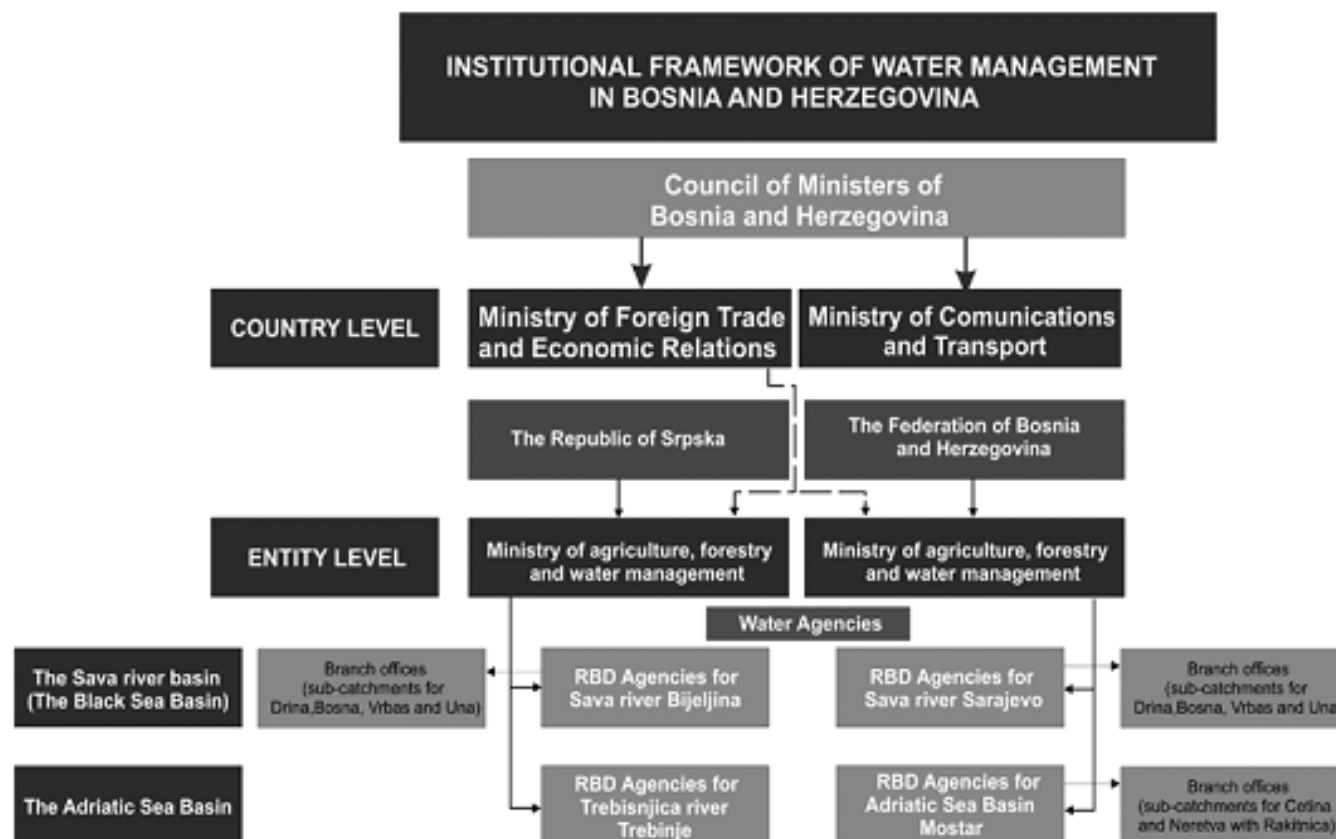
Full implementation of the EU Directive 2007/60/EC on the assessment and management of flood risks is expected by 2018. According to the new Water Laws, Entity Ministers (Federal Ministry of Agriculture, Water Management and Forestry in the Federation and Ministry of Agriculture, Forestry and Water Management in the Republika Srpska) are responsible for the preparation of Entity strategies for water management. The four River Basin District Agencies are in charge of water management and monitoring, as well as the preparation of water management plans.





**FIGURE 1: Summary of water management in BiH**

23. In terms of flood protection, some steps have been taken in preparing strategic documents and plans. For example, IPA project “Support to Water Policy in BiH (Dec 2009 – Dec 2011)” supported development of a Sub-strategy for the implementation of the EU Flood Directive (2007/60/EC).
24. The main documents in the field of water management are above mentioned Water management Strategy in FBiH and the Framework Plan of Development of Water Management of the RS and the implementation Action Plan in RS. The Framework Plan defines the criteria, conditions and obstacles for further development of the water infrastructure and management of the entire water sector, covering the planning period 2007 - 2016. These Entity strategies should be coordinated and harmonized, in order to provide a single strategy for the whole territory of BiH.
25. In order to implement these strategic papers and programmes, water management plans for river basins were planned to be adopted by the water agencies by 2016 for FBiH and 2015 for RS what seems at this moment to be unrealistic. These plans, among other issues, will deal with protection against the detrimental effects of water, protection from erosion, defense against ice, and drought control. They are to be revised and updated every six years. The working plans for the preparation of a water management plan are to be announced to the public at least three years before adoption of the plan.
26. The early warning and disaster risk reduction (DRR) system is also fragmented. Entities, BD and cantons develop their own laws, strategic documents and policies regarding civil protection. DRR priorities are rarely outlined specifically. Rather, they are included in various sectoral mandates at different levels. The Federation of Bosnia and Herzegovina issued several laws related to DRR, such as the Law on Spatial Planning and Land Usage (which requires the inclusion of data about areas prone to natural and/or man-made disasters/catastrophes in spatial plans, but does not mention risk assessments or vulnerability mapping as prerequisites). Amongst others, Republika Srpska has completed its enabling environment for DRR through the Law on the Regulation of Space issued by the Ministry of Spatial Planning Construction and Ecology, and the Law on Water, which outlines preventive measures to be taken to protect people and material goods from potential damage caused by floods or erosion of water surfaces, including a risk and vulnerability assessment of the relevant areas.
27. RS has developed a plan of protection and rescue in 2003. The Federation of BiH adopted its plan of protection and rescue in 2008. Brcko District does not have its own plan, yet various measures can be found in laws issued by individual ministries, e.g. the Law on Food, the Law on Healthcare, etc. The Civil Protection Plans of the Federation of BiH and RS contain similar elements in mobilisation and operational plans and preparedness measures. According to studies conducted by the Ministry of Security of BiH, inter-agency plans conducted at lower levels of organisation (entities, cantons and municipalities) are dysfunctional. The Sector for Prevention and Rescue within the Ministry of Security is making efforts to create a unified methodology for the preparation of planning documents at the state level and to provide adequate guidance on their content, in order to establish a coordinated system of plans for preparedness and activities at the interdisciplinary multi-organisational level.
28. Each year, entity governments, as main carriers of operational planning, approve various planning documents such as the Demining Plan, the Plan for Protection and Rescue from Fire, the Protection and Rescue Plan for Flooding, the Protection Plan and the Rescue from Snow and Snowfall as well as other plans developed depending on the circumstances.



**FIGURE 2: INSTITUTIONAL FRAMEWORK FOR WATER MANAGEMENT IN BIH**

29. The water management institutional framework is fragmented too and lacks vertical and horizontal cooperation (see Figure 2). At the state level, the system for civil protection is headed by the Ministry of Security through the Sector for Protection and Rescue. It leads policy design. However, because of the decentralized nature of the system, the brunt of the responsibility for measures taken to deal with protection and rescue is placed on the entities and Brcko District. The Ministry of Security and the Coordinating Body of BiH (composed of the Council of Ministers, five representatives from the Federation of BiH, five from RS and two from Brcko District) take the leading role only in the event of a large-scale accident with trans-boundary effects or which cannot be resolved at the entity level. Local governments lack capacity and resource to fulfill even basic DRR functions.
30. Civil protection centres are organised on municipal, cantonal and entity levels. There is emergency warning centre being organised on BiH (country) level, but it is still not in operation.
31. Split responsibilities in the past have already led to artificially triggered floods (e.g., Neretva 1999 when lack of coordination among various electricity agencies provoked confusion resulting in unwanted opening of the gates on some dams).

### **Current Approach to Structural Flood Defence in BiH**

32. Historically, flooding in Bosnia and Herzegovina was dealt with mainly by the construction of flood defenses. Throughout BiH and in the Vrbas river basin, flood defenses were severely damaged during the war and have remained in a poor state of repair due to limited budgets for maintenance of flood defenses. Many structures now fail to meet their design standards of protection due to the increased magnitude and frequency of large flood events in the last 10 years. No new flood defense structures have been built since 1998. There is no comprehensive national strategy for the design of new flood defenses, or the operation and maintenance of existing defenses although the current state of flood protection in BiH has been assessed<sup>14</sup>. Some documents make mention of flood defenses, such as '**Action plan for sustainable management of flood risks for Planning period 2010 - 2021 in Republic of Srpska**', prepared by the Ministry of Agriculture, Forestry and Water Management in RS for Sava river basin in RS which mentions planned new flood protections systems (length 40 km) to protect 200,000 hectares of agricultural and construction land in Sava river basin from floods. The **Water Management Strategy for Federation of BiH up to 2021**' (adopted 2012) identifies the need for *Reconstruction and rehabilitation of the existing and construction and maintenance of the system of protection facilities ....* as one of its goals for reducing the risk at extreme hydrological phenomena. While these documents suggest that there will be development of flood defenses in the future, there is no consideration of a strategic approach to flood risk management on the River basin scale, nor the inclusion of non-structural measures to ensure long-term sustainable flood risk management. In addition, there is no national guidance on the design and construction of new flood defenses and no requirement or methodology to include climate change considerations in the development of new structures.

### **Baseline Projects**

#### ***Emergency Flood Relief and Prevention Project - EIB Loan***

33. Following the 2009 flood events which ravaged the Republika Srpska, resulting in emergency food aid to 14,910 people, evacuation of 1,938 families and extensive damages to infrastructure, houses and agricultural land, the Government of Republika Srpska signed an agreement with European Investment Bank for Emergency Flood Relief and Prevention Project: Emergency reconstruction of flood protection facilities along Sava river and tributaries in 2011. The total value of this project is 92 million Euro to be implemented in 2012-2017.<sup>15</sup> The purpose of the project is to safeguard the agriculture, industrial and housing areas prone to flood impacts and to enable a stable basis for future development. The main focus of this project will be construction of hard engineering structures, mainly along the Sava River. The

<sup>14</sup> *Sub-strategy for the implementation of EU Directive on assessment and management of flood risks (2007/60/EC).*

<sup>15</sup> According to the signed agreement, funds could be spent until June 30th 2017 with possibility of extension upon agreement between EIB and the Government.

project will also make an inventory of damages to flood protection infrastructure within the RS's main Danube tributaries, prepare a Flood Risk Management and Flood Prevention plan including the identification of short, mid and long term measures and implement priority works for the remedy, repair and rehabilitation of damaged infrastructure in the most vulnerable areas. Aspects of spatial planning, redevelopment of flood areas and long and mid-term flood prevention measures are also included. In particular, the project will work on establishing protection zones and protected areas in accordance with the EU Directives. Out of the total project budget, USD 8 million will be directly spent in the VRB area for activities which will include: construction and reconstruction of embankments on river banks, channels, pumping stations, project documentation, mapping of flooded areas, etc. Currently the project does not incorporate climate change considerations in its planned activities, including infrastructure designs.

***Vrbas River Basin Environment and Tourism Development programme:***

34. In spring 2013, UNDP started a USD 1.25 million initiative - Vrbas River Basin Environment and Tourism Development programme, aiming to address key developmental challenges of the local communities through an integrated approach which will be focused on strengthening environmental protection, development of touristic potentials and local governance. The project's planned implementation timeframe is two years and it is implemented in partnership with Government of Japan, The Coca Cola Company, all the 13 municipal/city authorities of the VRB, CSOs and local communities in the exactly the same VRB area as the proposed adaptation project. The Vrbas River Basin Environment and Tourism Development programme is a continuation of activities previously implemented in nine Municipalities of Vrbas basin through the "Clean Vrbas" project.

***Disaster Risk Reduction Initiative in Bosnia and Herzegovina (DRR Project):***

35. This project will be implemented by UNDP in the period 2013-2015 and has a total value of USD 500,000. The project will work to improve enabling environment to reduce risk of disasters, in particular by supporting efforts of DRR platforms at state as well as entity levels and development of relevant plans and studies as well as awareness raising campaign. In order to increase preparedness and response capacities project will enhance existing capacities to build a reliable and efficient response system using positive models like REACT in Tajikistan. The project will also work to improve capacity and knowledge of communities and municipalities in disaster prevention and preparedness, with particular attention to especially vulnerable social groups.

***Entity activities on flood protection (link with EU Flood Directive):***

36. In 2010, Water agencies in BiH started activities on implementation of Directive 2007/60/EC on the assessment and management of flood risks. Based on 2007 IPA project "Support to Water Policy in BiH (Dec 2009 – Dec 2011)" a Sub-strategy for the implementation of the EU Directive was prepared in 2011. This Directive requires Member States (but also accession and pre-accession countries) to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. The Directive also reinforces the rights of the public to access this information and to have a say in the planning process. The main technical measures to be implemented by the Water agencies include preliminary flood risk assessment of the river basins and associated coastal zones and identification of areas where potential significant flood risk exists; development of flood hazard maps and flood risk maps for areas where real risks of flood damage exist; and flood risk management plans for these zones. Set deadlines are as follows:

	RS	FBIH
Preliminary flood risk assessment	2010-2013	2010-2013
Flood hazard and risk maps	2015	2015

### **Preferred Solution**

37. In response to the mounting climate change-induced risk exacerbated by anthropogenic factors and vulnerabilities in the Vrbas basin, BiH needs to ensure that it implements a flood risk management approach for the basin which is based on a well-developed knowledge base of flood risk, the avoidance of flood emergency situations through effective climate resilient spatial planning and adaptation measures, the mitigation of the flood damage and loss through the development and implementation of sustainable climate resilient intervention measure, and the reduction of the consequences of flood emergency situations through unified monitoring, forecasting, early warning and emergency response measures. Such as approach should ideally be underpinned by the development of regulations and policies to ensure adequate cross-sectoral enforcements as well as a coordination mechanism which would enable coordination between Entities and between Entity and State level. It will also require any legislative and policy framework to fully embed climate change considerations, something which is currently missing in BiH. An example of needed legislative and policy changes would be the introduction of floodplain development policy which would zone development away from high flood risk areas.
38. Support needs to target the most vulnerable groups of society, as well as local and national government institutions to undertake direct adaptation measures; those that minimize the exposure of people, economic assets and ensure that potential damage is limited to acceptable levels. BiH also needs to strengthen the early warning system for these events that are likely to exacerbate both in frequency and intensity as a result of climate change. In addition, BiH needs to strengthen its technical capacity to assess and manage flood risks, and ensure that such management measures are aimed at adaptation to climate change. This will include the development of flood risk management tools and methods that take full account of climate change considerations and that enable the development and design of sustainable, climate resilient solutions.
39. Importantly, the affected communities in the Vrbas basin will need to be fully engaged and empowered to participate in the adaptation measures for the basin.

### **Barriers**

40. Towards achieving the outlined above normative solution there are several barriers to be addressed:
  - 1) A lack of a comprehensive water and flood risk management policy and legislative framework to respond to climate change risks. Limited controls on adverse land use practices that impact on flood risk, and a lack of spatial control of development in the floodplain increase the exposure and vulnerability to flooding.
  - 2) Limited observational capacity that hampers effective risk assessment, management, forecasting, early warning and response. Essential to the assessment of risk and development of CC resilient and adaptive approaches, is the ability to observe and record hydrometeorological variables over time. In addition, essential to the establishment of a flood forecasting and early warning system is the establishment of a hydrometric network that provides an appropriate spatial resolution of hydrometeorological variables, as well as a database which can be used to store historical data and receive data for flood forecasting and early warning from monitoring stations. BiH does not currently have a centrally held hydrometric database and historical data records exist in many formats including paper.
  - 3) There is limited knowledge and application of the latest methods of flood management, especially hydrological modelling and climate risk assessment methods.
  - 4) Human capacities are limited at national and especially at local levels and lack decision support tools that provide better preparedness to increasing flood risks.

- 5) Lack of coordination among institutions, particularly at the national and entity level, for flood risk management and response. There is no coordination mechanism for Entity level water institutions. The main power and responsibility on water/flood issues lies with Entity Ministries (Agriculture, Forestry and Water management in RS and FBiH), while the state level (Ministry of Foreign Trade and Economic Relations ) has a more coordinating/reporting role to multilateral/bilateral agreements, etc.
- 6) Lack of reliable information and data on current socio-economic conditions of the catchment, and the social and economic impacts of the climate change on the communities in the basin.
- 7) Lack of a strategic approach and available funds for infrastructural improvements and flood protection.
- 8) Lack of adaptive capacity of the communities of the Vrbas basin.

### **Additional cost reasoning**

41. To overcome these barriers and enable the communities of the Vrbas to adapt to flood risk under climate change, this project is proposing an approach, focused on achievement of the following 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. The project will help the governments and the population of the target region of Vrbas Basin to develop adaptive capacity and embark on climate resilient economic development. The project is comprised of three main components:

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

**Component 2** - Technical and institutional capacity for transferring climate resilient flood management technologies and approaches

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

42. The following section discusses each component, expected outcomes and outputs in terms of the existing baseline and the expected alternative under the project implementation.

### **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**

43. Baseline: Flood risk management in BiH is currently aimed at emergency response to flood events rather than strategic management of flood risk through the legislative and policy framework and appropriate sectoral policies and plans that incorporate climate change considerations.
44. As mentioned above, key national strategic documents, such as Action plan for sustainable management of flood risks for Planning period 2010 - 2021 in Republic of Srpska or Water Management Strategy for Federation of BiH up to 2021 do not enable strategic approach to flood risk management on the river basin scale or consider climate change risks. Sub-strategy for the implementation of EU Directive on assessment and management of flood risks contains provisions for shifting towards sustainable flood risk management, however, it contains only a few sporadic references to climate change issues, moreover, its implementation is delayed and depends on funding availability.
45. **DRR Project** will work to develop a state level coordination mechanism between various institutions and authorities (Civil Protection, Ministry of Security on state level, etc.) in the area of civil protection. It will also provide a policy foundation for disaster risk reduction at state and entity level. The DRR project will not focus specifically on floods and other hazards, but rather will set general mechanisms and coordination lines in BiH. The project will also support integration of Disaster Risk Reduction into development programmes ranging from the local communities to the state level. Through supporting the

National Disaster Risk Reduction Platform, established in 2013, the DRR project will facilitate a shift in focus from disaster response, upon which present capacities are predicated, to disaster prevention through policy actions and the development of a priority sector plan, which will serve as an example and provide evidence for further advocacy and action in this direction. Lessons learned about how to make disaster risk reduction an integral part of development will be promoted throughout the project implementation. The DRR project will also invest in preparedness and response system that will lead to a decrease in disaster losses.

46. The *Sub-strategy for the implementation of the EU Flood Directive* mentions development and implementation of a Formal guidance on Flood Risk Management and Spatial Planning, which should be based on international best practice in spatial planning taking into account flood risk. However, references to climate change are very limited in this document and it is not clear whether this Formal guidance will incorporate climate change considerations. Furthermore, implementation of the *Sub-strategy* is highly dependent on funding availability.

47. Alternative:

- 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);*

48. The project will build on the existing legislative and regulatory framework and will fully mainstream the climate risk management (CRM) aspects, especially in relation to flood hazards. It will also complement *the DRR project* mainstreaming CRM in development programmes at the local and national level.

49. The project will take a basin-wide view of flood risk in order to understand and respond to the critical processes that lead to flooding within the basin, through the use of flood modelling and mapping (produced under Outcome 2) which will take account of future flood risk under climate change. This will underpin the floodplain development policy that the government will formulate to achieve a basin-wide resilience to increasing flood risks resultant from climate change. More specifically, the project will help formulate a comprehensive floodplain development policy, based on peculiarities of the Vrbas river basin. The development of land in flood plains has historically taken place in many areas mainly due to a natural tendency for settlers to utilize land that is near bodies of water, not with consideration of emerging risks. The current regulatory weaknesses described above and absence of any floodplain zoning policies also contributes to this progressively increasing exposure and vulnerability. As a result, the potential for flooding is often recognized only after the occurrence of climate hazard. Floodplain management and spatial planning are known as an effective means of flood prevention in the face of long term anticipated impacts of climate change. The project will develop a flood zone designation policy on the basis of flood mapping and outline the permitted land uses in each zone. It will also establish and publish development control rules and regulations designed to zone activities away from high risk areas and to encourage environmental enhancement of the floodplain. It will develop and implement a capacity building roadmap for national and regional authorities to integrate the new land use regulations into national and regional development planning. This will include the development of management tools that will be needed for implementing and enforcing the new land use regulations (such as compulsory flood risk assessments for individual property developments in the riskier zones within the floodplain, as part of the decision making process for granting planning permission). The introduction of floodplain zoning based on flood risk mapping represents a transfer of well-established floodplain management practices from countries that have been using this method for decades such as the UK, USA and Australia. The project will look to these areas for best practice approaches that can be adapted to the BiH context.

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



50. This Output will collect lessons learned from Outputs 1.1 and 1.2. and Outcomes 2 and 3 and facilitate dissemination of successful approaches in the country. In particular, the project aims to transfer best available approaches in climate resilient flood risk management from around the world and adapt them for the Vrbas River Basin. After implementation in the Vrbas River Basin, the successful practices will be codified in a form of guidance documents and upscaling in the rest of the country will be promoted. Most countries that are advanced in flood risk management (for example the UK) have nationally accepted guidance documents and tools on how to undertake flood risk management for any part of their territories and this project will aim to establish such national guidance and tools in BiH based on the work done under other Outputs.
51. For example, the approach to developing floodplain management and spatial planning policy to manage flood risk for the Vrbas basin will be scalable to other basins within BiH and this will be made possible by ensuring that the policy developed, while addressing the peculiarities of the Vrbas basin, is cognizant of the national picture and is therefore sufficiently general to be applied elsewhere. The new policy will therefore take a national perspective and will ensure that all key players are consulted in its development. Ideally the policy changes will be matched by legislative change if possible. To ensure upscaling, all tools, procedures, etc. developed by the project will contain recommendations on how to develop a similar approach for other regions in BiH. Particular attention will be paid to collecting best practices and lessons learned on how to make climate resilient flood risk management an integral part of development process, which will be done by building on mainstreaming approaches and using dissemination mechanisms established by the *DRR project*.

## **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**

52. Baseline: In BiH there is limited knowledge of integrated approaches and tools for adaptive flood risk management among the agencies responsible for water management and even less awareness of how it may be put into practice. Expertise in flood risk assessment using tools such as hydrological models is limited particularly within government organizations. Private companies have some expertise but even they are limited with regard to integrating climate change considerations into flood risk models. As discussed above, the existing institutional capacity focuses on flood defence rather than flood management resulting in a lack of knowledge and experience in using important tools to enhance Climate Change adaptation in water and flood management.
53. An important aspect of managing flood risk and developing adaptive capacities, is the ability to assess vulnerability and hence to test the effectiveness of adaptation measures in reducing vulnerability. The information required to assess vulnerability is not currently available and is not collected systematically, nor are there up-to-date methodologies for collection of information and assessment of damages. There are established procedures for assessment of damages within BiH, which are executed by municipal civil society protection departments, but quality varies from municipality to municipality, and with the capacity of local staff to carry out such assessments.
54. The existing hydrometric network is currently owned and operated by disparate agencies/institutions (for example public electricity institutes in charge of HPP stations) and data collected is not centrally stored, although it is made available to hydro-meteorological institutes. In addition, not all data is available in electronic format. Given the importance of accurate historical hydrometeorological records in the assessment of flood risk, it would be important to ensure that the hydrometric network is centrally managed and that data is made available to all flood management practitioners.
55. The Vrbas basin is characterised by large spatial and temporal variability in rainfall and flow and it is therefore necessary to have sufficient spatial coverage (number and distribution of rain and flow gauges) to provide accurate flood forecasts and long lead-times to respond to flooding. Up to 1991 there were 36

separate gauges installed on the Vrbas River (10) and its tributaries (26), however during the war many were destroyed and only 11 of these gauges were operational in 2011. Those 11 are mainly located along the main watercourse. Principally due to costs, very few of these gauges are in working order and many need to be re-surveyed because of large floods altering the stream profile. In recent years some have been renewed, maintained and monitored, but the majority still need attention. This is particularly important for tributaries which are now without gauging stations and there is no possibility for EWS during floods.

56. The ***Sub-strategy for implementation of EU Flood Directive*** notes that one of the main institutional risks for successful implementation of flood risk management is the lack of qualified human resources for data collection and data management, modelling and risk assessment. Furthermore, there is a lack of capacity of local government to contribute data and information, and to be properly engaged in the flood risk assessment and management. Finally, there is a serious understaffing in professional institutions for water management. For example, according to the organizational scheme there should be 166 employees at the level of the Federation of BiH, whereas in reality there are only 91 employees. It is estimated that in the Vrbas River catchment only 50% of water management positions are currently filled. The ***Sub-strategy*** mentions development of Communication and engagement plan for all relevant bodies (all bodies with water, drainage, land use emergency planning, spatial planning and development control, and environmental regulation within each entity) to be signed off by the Water Agency as well as workshops to introduce the Directive.
57. In the list of priority measures to be implemented by the ***Emergency Flood Relief and Prevention Project***, only three out of 13 municipalities from the VRB were included. Activities prioritized are flood mapping in municipalities of Srbac, Celinac and Laktasi and infrastructure maintenance in Srbac (canal cleaning and pumping station upgrade).
58. ***The DRR Project*** will Conduct Needs Assessment in DRR area in BiH, including policy area, preparedness and prevention, early warning system and local level risk management, with especial attention to vulnerable social groups (women, elderly, children). The project will also conduct awareness raising campaign among key decision-makers while encouraging active participation of women in dialogue and decision making. It also plans to increase capacities of members of response mechanism by providing relevant trainings.
59. To date the ***Water agencies*** have spent approximately USD 800,000 in the last three years on activities aimed to implement EU Flood Directive, however, none of this funding was spent in the VRB. The Water agencies (in line with ***the Sub-strategy***) initiated Preliminary Flood Risk Assessment (PFRA) for watercourses in FBiH, which included (i) collection of historic data with a comprehensive search of local sources (municipal representatives in charge for civil protection); (ii) assessment of extent of flood events based on existing hydrologic extremes (only rough estimate); (iii) development of indicative flood maps based on topographic maps and data from various projects. After PFRA, hydrodynamic modelling of flood areas was done for river stretches where Digital Elevation Model and cross section data were available, but not for Vrbas. Flood hazard and risk maps were prepared for five flood areas out of total 82 identified in FBiH. As data for Vrbas was not available, none of those five maps are in Vrbas catchment. The main constrain for Water agencies to continue with production of hazard and risk maps, is the lack of digital elevation model and channel sections and structures survey. Activities also included supply and installation of 23 automatic monitoring stations (river Bosna) and development of hydrodynamic models for the Sava river basin with the aim to produce flood risk maps in the future. Flood hazard and risk maps should also be prepared for the VRB, however, at this stage it is not clear when this will be done due to the lack of financing.
60. **Alternative:** This component will be focused on developing the tools, data, databases, monitoring systems, methods and procedures for enabling effective flood risk management. Importantly, it will include the elaboration of an institutional capacity development plan, and the provision of training in the use of all tools developed. The selection of measures for enabling effective flood risk management, as well as institutional capacity development plan will be based on the Needs Assessment performed by the

**DRR Project.** Institutional development plan will be also closely coordinated with Communication and engagement plan to be developed under ***Sub-strategy for implementation of EU Flood Directive.***

*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;*

61. There is currently no definitive or accurate hazard mapping for the Vrbas basin. The SCCF funding will enable extending mapping to be implemented by the ***Emergency Flood Relief and Prevention Project*** to the other 10 municipalities in the VRB and making sure that climate change risks are properly incorporated into the process. The proposed project will also attempt to fill in data gaps which prevented the Water agencies from producing hazard and risk maps for the VRB. In particular, it will acquire the DEM data, undertake river cross-section surveys, and develop hydrological and hydrodynamic models for flood hazard assessment and mapping.
62. In the first instance, modelling tools and methods of hazard and inundation modelling under conditions of climate change will be introduced to government departments involved in flood risk management, and flood hazard models and maps will be developed for the entire Vrbas project area. Based on the hazard and inundation maps, SCCF resources will be used to enable flood buffers to be established by Government with appropriate zoning categories such as: a climate change flood zone; a designated floodway fringe; a flood plain; a designated floodway; and lastly, the body of water itself (related to Output 1.2). In addition, the hazard maps will be used by national and local authorities, and communities in the development of emergency preparedness and response plans, for raising public awareness and improving community preparedness. The visual maps will benefit decision makers and all involved in natural hazard risk management at national and local level. It will also enable government and donor agencies to better focus their efforts in dealing with hazards in the basin in the future. A key benefit of this component is that the model will be a tool that can be used by the appropriate government agencies for the long-term strategic management of flood risk in the basin (see Outcome 1). The hazard maps will provide the basis for the management of climate-induced hydrometeorological hazards in the Vrbas basin now and in the future. The introduction of flood modelling methods, tools and practices is a key technology transfer opportunity for BiH, which is likely to have long-term benefits to climate-induced flood risk management and development of adaptation approaches.
63. With support of ‘Coordination of Mayors of Vrbas Municipalities for protection of the river’, established with support of the ***Clean Vrbas project***, the project will undertake socio-economic surveys to map existing vulnerability within the catchment and will undertake economic assessment to identify the most appropriate adaptation options to reduce vulnerability within the Vrbas basin. Importantly, the project will fully map the socio-economic conditions of the rural poor, returnees and displaced person within the catchment, which will contribute to a body of data that is currently missing from BiH. In undertaking this mapping exercise, the community will be engaged and encouraged to participate in the development of climate resilient adaptive measures that will meet their needs (to be implemented in Outcome 3). In order to develop flood vulnerability maps, a GIS-based tool will be developed to integrate various spatial socio-economic data with the flood hazard maps, and to produce vulnerability maps which will include damages and loss of life estimates. The project will develop tools, methods, guidelines and procedures for recording flood events, undertaking post-event surveys and assessing vulnerability to flooding as well as assessing the effectiveness of flood mitigation measures in reducing vulnerability and damages for long-term future management of flood risk within the catchment. This is also an example of technology transfer with long-term benefits to BiH.
64. The project will establish a spatially enabled data repository which will serve to store, maintain and manage all information pertaining to flood risk and to link spatial and temporal datasets such as river flows, rainfall etc. The data repository will provide a structured environment to enforce data integrity and

support data auditing, versioning and data quality, and to facilitate sharing of important hydrometeorological datasets. Audit trails, as well as structured and categorised schemas, will make data collation, manipulation and analysis more manageable. River basin management is inevitably a multidisciplinary and an inter-departmental undertaking, and such a structured GIS data repository is envisaged to provide the framework within which to approach flood risk management in a multi-disciplinary manner and to enable data sharing among relevant stakeholders.

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

65. In order to establish a much better monitoring network for the Basin in future, the project will undertake an assessment of the monitoring network requirements for effective monitoring for strategic flood risk management, flood forecasting and early warning in the future. Local hydrometry experts have already identified a number of gauges that are in need of repair, rerating, and refurbishment, as well as new gauging stations. The project will provide technical and financial assistance in order to improve hydrometric monitoring network. The upgrade and extension of the hydrometric network represents a key technology transfer opportunity which will enhance BiH's ability to undertake strategic monitoring, forecasting and early warning in the VRB.

*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)*

66. The long-term implementation and continued practice of climate resilient risk management will necessitate training at the national and local level. National and regional staff with responsibility for flood management and protection will be targeted for training in advanced climate risk management planning and flood risk management measures.
67. The project will build on general awareness-raising activities for key decision-makers and other trainings delivered by the **DRR Initiative in BiH**, including through adding climate risk management and flood risk management sessions in the trainings provided by the DRR project. Coordination will also be ensured with awareness raising and communication activities implemented under **Sub-strategy for implementation of EU Flood Directive**. The SCCF funding will be used to improve the technical capacity and knowledge base for climate risk management and a long term adaptation planning for flood risk management. The project will do so by introduction of advanced tools and methods to establish the process of planning that is scientifically sound and evidence-based (Output 2.1). The project will also help the relevant government departments and other relevant institutions to improve their hydrometeorological station coverage (Output 2.3) in this hazard prone region and improve the overall observation capacity; climate information storage, processing, analysis and dissemination protocols will be put in place (Output 2.2). Under this Output, the project will design and deliver the training programme to the government personnel (e.g. Water agencies) and other relevant stakeholders on climate risk assessment methods; and scenario based planning for water sector. To make sure capacities gained will be put into practice, the trainings will be delivered specifically to persons responsible for risk assessment, modelling, etc. in respective institutions. On-the-job trainings will be prioritized. Importantly, the project will develop an institutional capacity strengthening plan which will include recommendations for long-term training, staffing, continued development and succession planning for effective flood risk management.

**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**

68. Baseline: One of the root causes of increasing vulnerability and costs of damage from floods is increasing exposure, resulting from the inability of the affected groups to withstand and recover from flooding. In addition, in the absence of more stringent regulations for flood zoning as part of the land use planning,

irreversible adverse land use practices in the floodplain and the location of houses and economic activity (including subsistence agriculture) in the floodplain, are contributing to exposure. Lack of awareness of the risks and continued uncontrolled adverse practices, will further exacerbate the problem, and will increase the vulnerability and costs from flooding. Effective long-term decisions will only be possible by exercising a multi-stakeholder engagement, especially participation of local communities and community groups. As described above there is a lack of human and financial capacities to respond effectively to flood risk at the municipal level and involvement of citizens in civil protection and citizen's awareness of flood emergency response is limited.

69. There is currently no strategic flood risk management that identifies the best combination of structural and non-structural measures to address climate induced flood risk. During the last decade the damages incurred from flood and flash-floods was USD 31 million in the VRB. During the last decade the cost of flood protection and rehabilitation works has doubled, including due to intensified processes as a result of climate change. Existing flood protection structures are in a state of disrepair due to damage incurred in the war and a lack of funding for maintenance since then. In addition, the conventional structural measures have already proved inadequate to resist progressively increasing flood discharge volumes and will therefore become increasingly so, in the face of climate change. Based on experience, traditional structural measures like the building of reservoirs and embankments cannot always be adopted in areas susceptible to flash floods and hence there is potential benefit in adopting more climate resilient and sustainable engineering solutions such as bio-engineering measures that involve the use of local natural material and vegetative cover to restore the physical, biological and chemical flood-plain functions to improve water saturation and transmission to minimize the damage, while providing employment to the vulnerable groups within the basin. Knowledge of such advanced and climate-“smart” flood / flash flood management in BiH is limited and traditional hard engineering solutions prevail.
70. The existing flood forecasting and early warning system for the VRB is manually based and ineffective. It is based on a hydrometric monitoring network which is inadequate and does not effectively capture the full spatial variability of hydrometeorological variables in the catchment. The current system also does not give the desired results because of organizational deficiencies, in particular because of complicated organization of transfer of instructions during and after natural disasters.
71. As mentioned above, *the Disaster Risk Reduction (DRR) Initiative in BiH* will conduct Needs Assessment including for EWS and local level risk management, with especial attention to vulnerable social groups (women, elderly, children). The project will support use of new technologies such as mobile phone application for EWSs. This will ensure availability of real time information on disastrous and hazardous events together with appropriate disaster-related information and advice to citizens and public sector and greater penetration of information to vulnerable groups such as women and children. The project will also support consultations between different stakeholders (including regional cooperation), with full proportional representation of vulnerable social groups. It is envisioned that strengthened local level disaster risk management will build resilience of local communities that are most directly affected by disaster and climate risks.
72. Alternative: The project will work closely with regional authorities, municipalities, local representatives of the line ministries and local community groups to understand the risks and vulnerabilities (through vulnerability surveys mentioned in Component 2), and to develop appropriate flood management and mitigation measures with the full involvement of the community through Participatory Risk Assessment.

*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*

73. The project will develop an integrated flood risk management plan for the VRB, with the participation of local communities. This plan will take a bottom-up, multi-stakeholder, consensus-based approach. As part of the process the project will identify and initiate some of the priority flood management measures (e.g. community afforestation scheme on the flood plains; establishing locally controlled and managed flood zones; watershed rehabilitation works etc). The project will also ensure that tools and guidelines are put into place to enable future update and development of the plan. Importantly, the project will explore the

options for incentives (through municipal job creation or loan / insurance repayment schemes) whereby the local population is systematically engaged in flood management solutions on the ground. Index-based flood insurance has often been advocated as a long-term non-structural measure for building resilience among flood victims, and is one of a broad scope of risk management approaches that can be used as a financial instrument to help zone development away from high risk areas. The project will explore the possibility of introducing an index-based flood insurance scheme for the Vrbas basin.

74. Based on hazard and inundation maps produced under the Component 2 and following some of the key floodplain policy measures that will be developed and implemented in Component 1, the project will invest in direct adaptation action and implement concrete long term climate resilient flood management activities, in selected high hazard risk municipalities based on the vulnerability assessment undertaken. Some of these “hot spot” locations have already been identified (See Table 1). Selection of the thirteen focus communities will be finalized during the PPG phase, based on the following criteria: damages from flooding over the last 10 years, number of IDPs/returnees, poverty level, level of ownership from the community (level of co-financing). Measures implemented in identified hot spots will allow for upscaling of the adaptation measures and practices that will prove to be successful within the scope of the project. The structural and non-structural options will be identified and developed using the flood model to assess feasibility, and develop solutions based on a detailed consideration of climate change scenarios. This options-modeling in combination with the vulnerability mapping and socio-economic cost-benefit analysis (using the economics assessment tool to also be developed under Component 1) will be used to identify and prioritize preferred options or combinations of options which result in the most effective and holistic flood risk management for the basin. The integrated flood risk management plan will include a costed intervention plan (comprising the identified and designed structural and non-structural measures), a programme of implementation and an implementation management plan and will be developed with extensive consultation with, and involvement of all stakeholders, including the communities. It should be noted that this project will not fund the implementation of structural measures, but will implement the identified non-structural measures to address flooding in the hot spot areas. The introduction of such methods of identifying, evaluating and prioritising structural and non-structural measures will utilise established best-practice methods from other countries. An advantage of introducing these methods is that it will establish a method of prioritising intervention options, based on all relevant data, and taking account of vulnerability. The methods will be useful in the future where limited funds are available for action, and can therefore help the country to better identify where limited funds should be spent in the future. This represents a transfer of both technology and best practice.
75. The proposed project will work with the ***Emergency Flood Relief and Prevention Project*** with the aim to incorporate modeling and vulnerability assessment results in the design of the hard structural measures to be implemented for the Vrbas basin. Ideally, the detailed design of structural measures would be deeply rooted in climate change adaptation and would be developed alongside non-structural measures to provide a catchment-wide strategic overview of the optimal options for Vrbas basin.

### *3.2. Participatory community-based adaptation strategies, technologies and practices implemented in priority flood risk areas.*

76. The project will focus on engaging with all local communities to ensure that they participate in the definition of the problems and the development of the solutions. The adaptation solutions will focus on transferring best available technologies for local level flood risk management. Extensive community surveys will be undertaken to help characterise the socio-economic status of the communities and to hear first-hand, what their issues are and what they would like to see as the solutions. Participatory Geographical Information Systems (PGIS) will be used as a means of integrating local community information into the assessments of the problem and the formulation of the solution and to strengthen involvement of communities or marginalized groups in decision making. A number Participatory Rural Appraisal (PRA) approaches will be used to collect community-based data, including the use of interviews, questionnaires and the general use of ephemeral mapping, sketch mapping and scale mapping. The use of PRA is another example of technology transfer, which will then be promoted for further use in BiH.

*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;*

77. The project will roll out a direct campaign to make flood-prone communities aware of flood risks and means of effective risk management. The project will therefore aim to develop policies, methods and long-term practice of public participatory involvement in adaptive flood risk management in the Vrbas basin and will develop adaptive interventions that will improve the financial stability of the communities, which increase their resilience to climate-induced flooding. Interventions such as employment schemes for maintenance of flood defences, replanting of floodplain and hillslope vegetation and implementation of agro-forestry, and operation of a community-based flood monitoring and early warning system. Such schemes will provide paid employment for poor local communities while at the same time, reducing flood risk and building resilience against climate change. When possible, awareness raising activities will be delivered to local communities through events organized by the **Vrbas River Basin Environment and Tourism Development programme**, which aims to work specifically with the communities living on the river banks.

*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.*

78. Flood forecasting and early warning is a key non-structural measure which forms an important part of any flood risk management framework. To address the issue of effective emergency response at municipal level, the project will strengthen early warning capacity for the VRB by developing a fully integrated EWS which will include a central EWS (entity-based, as well as inter-entity and entity-state coordinated) and community-based EWS for the communities of the VRB. Coordination mechanisms created by the **Clean Vrbas Project** and to be created by the **DRR Project** will be used for this purpose.
79. The present forecasting and early warning system (FFEWS) for BiH is based on a simple procedure of manually reading and communicating rainfall and water levels, and this will need to be further professionalized and enhanced through the introduction of automatic monitoring stations where possible. This component will also help strengthen capacities and collaboration between all agencies with monitoring, forecasting, warning and response functions with respect to flooding and represents a key technology transfer opportunity. Given the size and complexity of the study basin, the flood forecasting and early warning system to be developed will be an integrated set of community-based, district and entity level approaches with well-defined procedures for exchanging information and clearly defined roles and responsibilities.
80. An initial assessment will need to be carried out to determine the optimal combination of community-based and central early warning systems. Here the proposed project will build on Needs Assessment to be undertaken by the **DRR Project**. The proposed project will also replicate use of mobile phone and other technologies for EWS if piloting by the **DRR Project** will prove successful.

#### **Gender and vulnerable groups**

81. In engaging with the communities, the project will pay particular attention to inclusion of vulnerable groups and particularly women to ensure that gender issues are taken into account. Gender affects all aspects of vulnerability in societies and there is a need to measure the difference in gender vulnerability to understand who will be at greatest risk in the event of a disaster and evaluate the differential impacts among different groups. One type of differential vulnerability between women and men arises from biological factors. Pregnant and nursing mothers are particularly vulnerable because of their increased need for food and water and their decreased mobility. As the primary caretakers of their homes, women tend to the needs of children, elderly and the disabled. This increases their workload and reduces their mobility in cases where quick evacuations are required or where they live a long distance from evacuation routes. Gender also influences the allocation of social and economic resources in ways that exacerbate women's vulnerability to natural disasters. Women generally have more limited access to the resources their families need for survival and recovery in the wake of disaster. Formal risk management tends to be

male oriented despite the fact that women are custodians of family health and hygiene and providers of domestic water and food, all of which is affected by flooding. In addition, ECLAC studies have shown that, female reproductive health is often affected by flooding.

82. In BiH there are large differences between the genders, in line with traditional gender roles. Men are more than twice as likely as women to be employed, self-employed or engaged in contract work. In general, male-headed households have higher incomes than female-headed households and overall there is a big difference in the income of male-headed households (780 KM/month) and single female households (431 KM), which emphasises the increased vulnerability of female-headed households. For effective flood risk management, the project will ensure that women are primary stakeholders and will therefore need to be involved in decisions on the types of solutions that are implemented.

### **Adaptation Benefits**

83. 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 the 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 will directly benefit 250,000 people within two administrative parts of BiH and contribute to further reconciliation in a war damaged area. Indirectly the project will also benefit at least 464,000 people living in the VRB or 15% of the country's population.
84. The project will improve the knowledge base on flood risk through fully developed modeling and flood mapping. This, as well as the efforts to increase institutional capacity, will lead to improved strategic management of flood risk and improved flood forecasting and warning. In particular, the population of the VRB will benefit 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 will be reduced due to increased awareness and direct engagement of local communities in flood risk management. Adaptation of climate resilient agricultural practices by farmer communities will increase their adaptive capacity and reduce exposure. Employment guarantee schemes will further increase adaptive capacity due to better financial stability of households.

### **Innovativeness, sustainability and potential for scaling up**

85. The project is the first in BiH to attempt to manage flood risk at the river basin scale, by considering all of the key requirements of flood risk management including, legislative and policy-based landuse and floodplain management, development and strengthening of institutional capacity to manage climate-accelerated flood risk, and with community based, participatory methods for building resilience to flood risk.
86. Through Component 1 the project will be the first in BiH to attempt legislative change to enable flood risk management and to link land use and spatial planning, control and management to flood risk management. The key benefit of this approach is that, it will help to zone people, property, and economic activity away from high flood risk zones under climate change. In addition this approach will provide opportunities for the floodplain to re-establish its natural functions. Importantly, the approach will be scalable to other basins since the legislative change will be at state level thus ensuring the sustainability of the approach.
87. Through Component 2 the project will enable the state and local governments to effectively undertake flood risk management in the future, through the provision of the appropriate tools and technology and by strengthening capacity in risk management through training. The project will adopt a 'Training the trainers' approach which will ensure sustainability and continued development of capacity in B&H. This will be the first project to develop a river basin scale flood modeling and mapping approach and develop an integrated flood risk management plan to identify the most appropriate intervention measures for the basin.



88. Under Component 3 the project will be the first in BiH to specifically target returnees, displaced persons and the rural poor and to map the vulnerabilities of these marginalized groups. The project will be the first to implement community-based participatory approaches and to systematize the mapping of socio-economic statistics on vulnerability and provide tools for long-term assessment of vulnerability. It will provide bottom-up community based training as well as train the trainers approach to ensure sustainability.
89. The project will develop community based approaches to flood risk management which will involve the vulnerable communities directly in the implementation, and long-term management of flood mitigation measures and in so doing will provide employment opportunities for the marginalized communities of the Vrbas basin. The project will implement community-based early warning systems with the help of the local communities and provide employment opportunities to enable the communities to run and manage the warning systems themselves. This will give ownership of the system to the communities and in so doing ensure its sustainability. In addition, the community-based early warning system will be linked to a centrally based system, which will give communities the chance to contribute to the wider flood risk management within BiH.

### **Environmental and Social Screening**

90. Following the application of UNDP's Environmental and Social Screening guidance at the PIF formulation stage, the project idea has been assigned a category 3a, signifying that impacts and risks are limited in scale and can be identified with a reasonable degree of certainty and can often be handled through application of standard best practice. These risks will require some minimal or targeted further review and assessment to identify and evaluate whether there is a need for a full environmental and social assessment. During the preparatory phase for this project assessments will be undertaken, using preparatory grant funds, to (i) identify activities that will minimize or negate any environmental and social impacts or increase vulnerable to environmental and social change through the changes that this project will make to upstream planning processes on national and sub-national level; (ii) work specifically to reduce the likelihood of flood risks to vulnerable groups of population as a result of any construction that this project will need to undertake; (iii) to ensure that gender equality and women's empowerment efforts are not undermined as a result of the project (vi) minimize the likelihood of differentiated impacts on women and men; and (v) reduce impacts that could affect women's and men's ability to use and develop natural resources (adoption of climate resilient agricultural practices by farmer communities).
91. The UNDP Initiation Plan for the preparatory phase, which governs the preparatory activities to be undertaken to develop and articulate the project document, will include activities and appropriate resources to further investigate likely environmental and social impacts of the project. Safeguards specific assessment will be conducted based on the initial risks identified during the screening of the PIF. Results of this assessment will inform project design and measures to minimize environmental and social risks will be articulated in the project document.

### **A.2. Stakeholders. Identify key stakeholders (including civil society organizations, indigenous people, gender groups, and others as relevant) and describe how they will be engaged in project preparation:**

STAKEHOLDER	KEY RESPONSIBILITIES	RELEVANT ROLES
Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina; Ministry of Security of B&H	Implementing partner, Coordination, advocating	Supervision and coordination (Outcome 1, 2, 3)
Entity ministries of Agriculture, Water Management and Forestry	Coordination, advocating	Supervision and coordination (Outcome 1, 2, 3)
Entity Hydro Meteorological Institutes	Responsible Parties	Responsible and accountable for technical inputs and providing data and analyses; project beneficiaries

		(Outcome 1 and 2)
Entity Water Agencies	Responsible Parties	Responsible and accountable for technical inputs and providing data and analyses (Outcome 1, 2 and 3)
Smallholder farmers, rural poor	Innovators, Responsible Parties	Beneficiaries. Responsible for identification and delivering of adaptation activities; as well as project beneficiaries (Outcome 3)
Returnees and displaced persons	Responsible Parties	Beneficiaries. Responsible for identification and delivering of adaptation activities; as well as project beneficiaries (Outcome 3)
Civil protection institutions on all levels	Responsible Parties	Responsible for delivering of adaptation activities; as well as project beneficiaries (Outcome 1, 2, 3)
Municipal Reference Groups	Responsible Parties	Coordinate municipal activities among different stakeholders; mainstreaming. (Outcome 3)
NGOs including environmentally based organizations, social inclusion and protection organizations (for returnees and displaced persons, vulnerable groups, minorities, etc.)	Responsible Parties	Rising awareness, delivering of adaptation activities and capacity development (Outcome 3)
Private sector / Micro agricultural businesses	Financial services provider; Implementing partners	Responsible for implementation of adaptation measures (Outcome 3)

92. On national and entity level, ministries responsible for water management, water agencies, hydro meteorological institutes and civil protection will be invited to participate in project preparation. On entity and cantonal level, political, operational and executive jurisdictions for water sector rest with line Ministries in charge of water. UNDP has excellent relationships with the both Entity Ministries in charge of water issues, developed through several water related projects implemented jointly in the past. The Ministries have been extensively consulted in the PIF preparation process and contributed data and practical guidance. One of the important roles of the Ministries in this project will be 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.
93. On local level, in the project preparation phase the project will organize mapping of all stakeholders in the project area and create a reference group in each municipality. It is expected that civil protection organizations and representatives from municipal government will take active participation in these reference groups. Additionally, civil society organisations that could be interested in project results would be involved and encouraged to take active participation. Particularly it would be environmental organisations, social inclusion and protection organizations (for returnees and displaced persons, vulnerable groups, minorities, etc.) who should be actively involved in project preparation and implementation. The project will make a specific attempt to involve private sector in the VRB. Micro agricultural businesses in will be involved due to the fact that they are among most affected by floods groups.

**A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):**

Risk	Risk rating	Risk mitigation strategy
Low level of response and/or interest of local communities to be involved in FRM and to apply proposed adaptive measures	Medium	From the very beginning of the project implementation, specific attention would be on active participation of local communities in the process of FRM (their problems, needs, etc.) and implementation of adaptation measures.  The project will also roll-out an awareness raising campaign targeted at flood-prone communities.
Number of different level stakeholders in the FRM in Vrbas River Basin can create confusion and result with possible conflicts.	Medium	The project will clearly assign roles and responsibilities to all stakeholders, from local level (citizens, civil protection, municipalities) to entity and state level (Ministries, Water Agencies, Hydro meteorological Institutes) and create strong project board that will lead project implementation.
Limited technical capacity to meet the challenges of integration of the climate changes into flood risk management	Medium	Project will create and deliver special capacity building modules targeting different groups of stakeholders to increase capacities both on local level and state and entity level to be ready to implement specific measures.
Limited data availability	High	In its inception phase, Project will specially focus on establishing modalities on data collection and recording.

**A.4. Coordination. Outline the coordination with other relevant GEF financed and other initiatives:**

94. Project will build on a very strong and extensive partnership basis which UNDP already has established in the Vrbas area through 18 years of cooperation with the national, entity cantonal, municipal and smallest local communities. The cooperation was established in the years immediately after the war in Bosnia and Herzegovina over the issues of return and recovery, continued with focus on economic revitalization, infrastructure repair and livelihoods, while in the last years it has shifted towards strategic planning, capacity development, environment protection and sustainable economic development.
95. Specifically, project coordination will be built directly on the work done in the last two years through the above mentioned ***Vrbas River Basin Environment and Tourism Development project***. In particular, the Coordination Team for Protection of Vrbas, consisting of Mayors of all the Municipalities of the VRB, will be used to coordinate with all regional initiatives as well as a vehicle for project promotion and implementation. The Coordination Team is a central and very effective platform for coordination of activities in VRB and its thematic working groups can represent an ideal vehicle for real outreach and effective participation of all the key stakeholders. Furthermore, local presence of the ***Vrbas River Basin Environment and Tourism Development project***, collected data on social and economic vulnerabilities and established cooperation with local communities will be used first during preparation of full project proposal and later, during implementation phase to set up management and administrative structure.
96. Sava Commission implements a pilot project on climate change adaptation: Building the link between the FRM planning and climate change assessment. Main purpose of this project is to address flood management in the Sava River Basin, taking into account the impacts of climate change under different scenarios and the perspective adaptation measures envisaged. The proposed project would use all results

from the Sava Commission project and extend area to one of the most important tributaries of Sava River – Vrbas River.

97. At the regional level, the project will collaborate with the EU Civil Protection Mechanism and Instrument for Pre-Accession (IPA). The IPA 2011 has the following relevant focus areas: training and study tours for IPA beneficiaries, regional coordination workshops, development of a Five-Year Disaster Risk Reduction Plan for the Western Balkans, development of a regional knowledge platform and database for national and regional information, development of hazards databases and/or their alignment with EU standards, provision of and training in risk modeling tools, capacity development in hydro meteorological forecasting and data management, and development of a regional Multi-Hazard Early Warning System. Also, of particular relevance for integrating activities and resources is the regional project Building Disaster Resilience in Western Balkans and Turkey, which is implemented by the UN International Strategy for Disaster Reduction (UNISDR) and WMO, with the support of the European Commission Directorate General for Enlargement under the IPA Programme.
98. In order to avoid duplication of efforts and maximize coordination with the above outlined initiatives Emergency Flood Relief and Prevention, UNDP Clean Vrbas project, UNDP DRR project, as well as Sava Commission's project, during the PPG phase the project will initiate discussion on coordination with government representatives, consultants and representatives of the donor agencies through already existing Donor coordination group on environment and infrastructure. The group is convening regularly to share information, provide inputs, including lessons learnt, and could be used for overall advice on the project development and implementation.
99. Bosnia and Herzegovina has well developed communications, media and internet infrastructure. This opens possibilities for creative approaches to communications and developing different approaches for the different specific target audiences. While for some of the elderly populations in remote areas still the best communication strategy is organizing a village level community meeting, for most of young people a much better strategy is to use modern channels, including the social media. Through the "Clean Vrbas" project UNDP is already developing and piloting several innovative approaches that could be expanded through the adaptation project, including use of social media. For the consensus building and dissemination of specific expert level findings, policies, approaches and other strategic results to the stakeholders from the key partner institutions, local authorities, academia and CSOs the best vehicles are workshops, round tables and high level debates, to be supported by the project.

#### B. Description of the consistency of the project with:

##### **B.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAs, NAPs, NBSAPs, national communications, TNAs, NCSAs, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.:**

100. According to the Initial National Communication (INC) of Bosnia and Herzegovina, the country needs international support for technology transfer. The INC emphasizes a need to modernize the hydro-meteorological network and create an integrated monitoring system, 'particularly with the purpose of automatic monitoring and software control of the situation in river basins'. The draft Second National Communication re-confirms importance of these activities.
101. Bosnia and Herzegovina as an EU candidate country has obligation to integrate water Acquis Communautaire. Both EU Floods Directive and EU Water Framework Directive are placing climate changes as one of the priorities to be integrated and considered in the planning phase. Additionally both International Commission for Protection Danube River and International Sava River Basin Commission strategic documents foresee flood protection and adaptation to climate changes as a priority. However, as until now there was no localized climate change model developed for BiH, there was no possibility to integrate climate changes in the water sector strategic documents in BiH. With the localized climate change model developed for BiH through SNC, now conditions exist to perform that task, but country lacks knowledge, financial and human capacities to do that on its own.

102. 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. The Government of BiH (state level) is highly in favor of this project, and this project idea has been communicated with entity line ministries which also fully support the project. Although existing water development framework does not consider the long-term implications of climate change, it provides favorable baseline conditions for the SCCF project to advance policies and implement suit of on the ground measures for addressing adaptation needs in flood management. Access to SCCF will enable BiH Government to address the above issue in Vrbas River basin and at the same time create a case of integrated approach to river basin management, which can be easily replicated to other river basins in the country, along with promotion of innovative adaptation strategies and technologies.

## **B.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities:**

103. The Project is in line with the GEF CCA results framework: CCA-3: Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology, where it will contribute to 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.

104. The proposed project is:

- Country and target area-driven: consultation meetings have been organized with the flood-affected municipalities in the Vrbas River Basin. The proposed project builds on priorities identified through development of the National Communications, National Adaptation Strategy and preparation and implementation of UNDP Clean Vrbas project;
- Cost-effective: the project will take proven approaches to flood risk management replicable in other regions of the country;
- Supports implementation of national sustainable development and poverty-reduction strategies: the project will help to implement the priorities as outlined in the National Adaptation Strategy, as well as in the Poverty Reduction Strategy Paper—Mid-Term Development Strategy<sup>16</sup>.
- Relevant: as outlined in the Problem description section, according to the National Communications, the problem of floods has been exacerbating in the last years and is expected become progressively more serious due to climate change in the country and in particular in the Vrbas River Basin.

## **B.3 The GEF Agency's comparative advantage for implementing this project:**

105. In Europe and CIS region, UNDP is one of the leaders in supporting countries on advancing climate change adaptation and in assisting governments in preparation of low-carbon and climate-resilient development strategies. In Bosnia and Herzegovina, UNDP is the leading government partner on all climate change related issues. With the technical assistance of UNDP, the Government has prepared and submitted the INC to the UNFCCC and is currently finalizing the SNC process. UNDP has supported the Government in preparing Low emission development and Adaptation strategy and now is working on preparation of four National Appropriate Mitigation Actions – NAMAs (mining sector project, fossil to biomass fuel switch project, “nearly zero” buildings project and Urban NAMAs project), which will be developed and submitted to UNFCCC by end of this year.

106. UNDP Country Office (CO) has strong presence in the field, and one of the four regional offices is based in the Vrbas River Basin. This office is responsible to coordinate all UNDP activities in VRB and

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<sup>16</sup> **Bosnia and Herzegovina: Poverty Reduction Strategy Paper—Mid-Term Development Strategy** (April 2004, IMF Country Report No. 04/114 <http://www.imf.org/external/pubs/ft/scr/2004/cr04114.pdf>)


to implement Clean Vrbas Project. Furthermore, UNDP established partnerships and trust with governments, civil society and private sector and developed cross-sectoral expertise in strengthening economic development, social development, and governance. All the above, together with a proven record of designing and implementing climate change policies and measures, gives UNDP CO in Bosnia and Herzegovina a comparative advantage for implementing SCCF funds.

**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**

- A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):** (Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this template. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Senad Oprasic	Head of Environmental Unit	Ministry of Foreign Trade and Economic Relations	01/08/2014

- B. GEF AGENCY(IES) CERTIFICATION**

<b>This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for project identification and preparation.</b>					
Agency Coordinator, Agency name	Signature	DATE (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
Adriana Dinu Executive Coordinator and Director a.i., UNDP/GEF		January 22, 2014	Anna Kaplina	+421 2 59 337 427	<a href="mailto:anna.kaplina@undp.org">anna.kaplina@undp.org</a>