ADAPTATION FUND

REGIONAL PROJECT PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project:	**Integrated climate-resilient transboundary flood risk management in the Drin River basin in the Western Balkans**
Countries:	Albania, the Former Yugoslav Republic of Macedonia, Montenegro
Thematic Focal Area[1]:	Disaster risk reduction and early warning systems
Type of Implementing Entity:	Multilateral Implementing Entity (MIE)
Implementing Entity:	UNDP
Executing Entities:	UNDP, Global Water Partnership
Amount of Financing Requested:	US$9,927,750 (in U.S Dollars Equivalent)

Project / Programme Background and Context:

1. The Drin River Basin (DRB) is a transboundary river basin, which is home to 1.6 Million people and extends across Albania (30% of basin area, 27% of total country area, 37% of basin population), Kosovo[2] (23% of basin area, 42% of total country area, and 35% of basin population), the Former Yugoslav Republic Macedonia (17% of basin area, 13% of total country area, and 11% of basin population), Montenegro (22% of basin area, 32% of total country area, and 17% of basin population) and Greece.

2. Climate change and climate variability have been increasing the frequency, intensity and impact of flooding in the basin[3]. Historical flood data from the Western Balkans suggests a more frequent occurrence of flood events, attributed to an uneven distribution of precipitation and torrential rain, particularly over the last decade. More and larger areas and, therefore, a greater population numbers are being affected by flooding with a strong impact on national economies. Future climate scenarios project a further increase in the likelihood of floods as well as in their destructive nature. The proposed project will enhance resilience of the DRB countries and communities to climate-induced flood risks.

Geographical and Development Context - Regional and Country Perspective:

3. The Drin River a transboundary river in Southeastern Balkan peninsula which is inhabited by over 1.6 million people, living in 1,453 settlements, and encompasses several complex eco-systems that provide unique habitats for many indigenous species important from both European and global conservation perspectives. Besides the three big natural lakes – Prespa, Ohrid and Skadar/Shkodër – the basin includes several large water reservoir cascades along the Black Drin River in FYR Macedonia and the Drin River in Albania.

4. The Drin River, 335 km long, runs through mountainous areas (highest peaks on the Dinaric Alps of over 2,500 masl) in the south-western Balkans towards the Adriatic Sea, draining a topographic area of 20,311 km^2 and providing the third greatest river discharge into the European Mediterranean. The Drin River has two distributaries one discharging into the Adriatic Sea and the other one into the Buna River. The basin has four main sub-basins and several lakes (Figure 1).

[1] Thematic areas are: Food security; Disaster risk reduction and early warning systems; Transboundary water management; Innovation in adaptation finance.
[2] References to Kosovo shall be understood to be in the context of Security Council Resolution 1244 (1999)
[3] FLOOD PREVENTION AND MANAGEMENT: Gap analysis and needs assessment in the context of implementing the EU Floods Directive, September 2015, European Commission

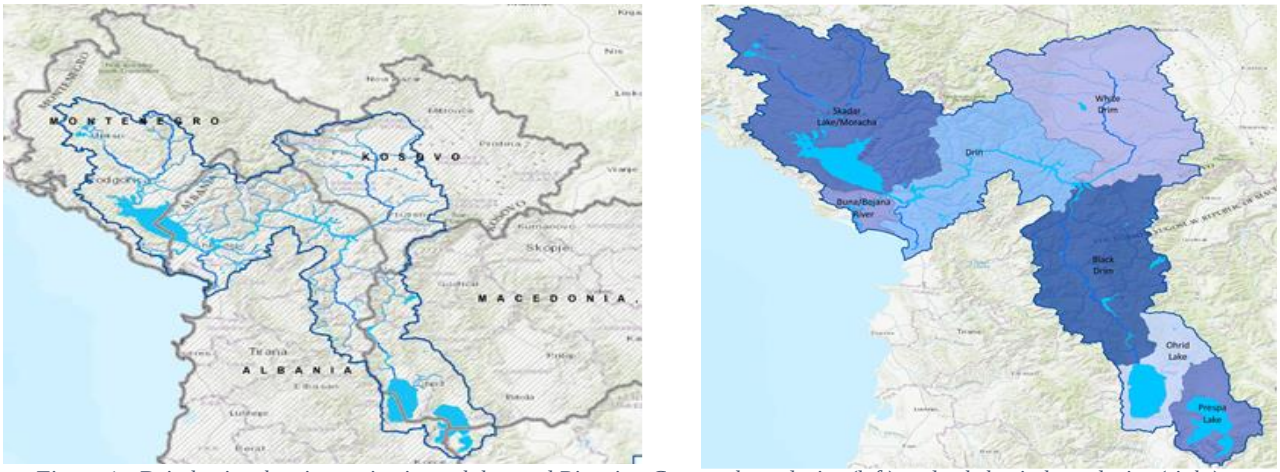


Figure 1: Drin basin, showing main rivers, lakes and Riparian Country boundaries (left) and sub-basin boundaries (right)

5. The **Black Drin** (Crn Drim/Crn Drini) outflows from Lake Ohrid (controlled outflow since 1962), in FYR Macedonia, and flows north through Albania, draining the eastern, mainly mountainous, region of Albania. The total area of the Black Drin basin is 4,472 km^2 (3,295 km^2 of which is in FYR Macedonia) or 22.4% of the DRB. It has an annual discharge of 1,502 million m^3. Two large reservoirs (Globochica and Spilje) have been constructed in this river basin on FYROM side, another 4 dams and 3 reservoirs (Fierze, Komani and Vau I Deje) at the lower Drim in Albania – all with the main purpose of hydroelectric power (providing over 90% of Albanian electricity). The Black Drin crosses near Debar the border to Albania.

6. The **White Drin** surfaces in Kosovo and flows into Albania where it meets the Black Drin at the town of Kukës to form the Drin River. The White Drin drains a karstic region of nearly 3,780 km^2 in Kosovo and 522 km^2 in Albania, resulting in total area of the sub-basin of 4,292 km^2, or 21.5% of the DRB. The Kosovo flow of the White Drin River receives many relatively long tributaries. In the Albanian section of the river there are practically no settlements.

7. **Drin River** flows from Kukës in Albania westward (in the initial section) and southward through northern Albania. The total area of the Drin River equals 4,237 km^2, or 21.2 % of the DRB area. The Gjadri and Kiri rivers join the Drin downstream of the Vau i Dejës dam. Further downstream the river splits into two arms, one which flows directly to the Adriatic Sea southwest of the town of Lezhë (at the Bay of Drin), and the other which flows into the **Buna/Bojana River** downstream of the Skadar/Shkodër Lake. The Drini-Buna River Basin is characterized by groundwater appearances. A number of aquifers exist, often with complex groundwater-surface-water interaction and interdependency. The channel of Drin that flows directly to the Adriatic carries only a relatively small discharge, while most of the Drin flow joins Buna/Bojana River. The Drin Delta which is a complex of relatively intact coastal lakes, marshes and forests, has been recognized as an Important Bird Area of international importance by designation under the BirdLife International Convention[4].

8. The **Lake Prespa** sub-basin comprises the two lakes of Small Prespa and Prespa that are linked together through a channel. A large part of Small Prespa[5] is in Greece, while Prespa Lake[6] is shared between FYR Macedonia and Albania. Lake Prespa drains into Lake Ohrid through underground karst cavities of Galichica and Mali I Thatë mountains. The area of the sub-basin is 1,410 km^2 (not including Small Prespa) or 7% of the total DRB area. Prespa Lakes are the highest tectonic lakes in the Balkans. The area is especially important for water birds, notably the largest breeding colony of Dalmatian pelicans in the world and they are also part of Ramsar List of Wetlands of International Importance.

9. **Shkodra Lake**, a Ramsar site, is the largest lake in the Balkan Peninsula with a surface area varying between 370 km^2 and 530 km^2. It is one of the largest bird reserves in Europe, having 270 bird species, among which are some of the last pelicans in Europe.

[4] http://datazone.birdlife.org/site/factsheet/drini-delta-iba-albania
[5] Limni Mikri Prespa (Greek); Prespa e Vogël (Albanian); Malo Prespansko Ezero (Macedonian).
[6] Also called Great Prespa Lake: Prespansko Ezero (Macedonian); Liqeni i Prespës (Albanian); Megáli Préspa (Greek).

10. **Lake Ohrid**[7] is one of Europe's deepest and oldest lakes and the largest by water volume in South-East Europe, with estimated volume of 55,500 million m^3. It is the deepest lake of the Balkans, with maximum measured depth of 288 m (mean depth 155 m). The lake is shared between FYR Macedonia (272.8 km^2) and Albania (84 km^2). The total area of the Ohrid Lake sub-basin is 919 km^2, or 4.6% of the entire DRB. The lake preserves a unique aquatic ecosystem with more than 200 endemic species. Because of this importance, in 1979 it was declared a World Heritage site by UNESCO.

Development Outlook

11. All of the Riparian countries of the Drin basin are developing middle-income economies[8]. Kosovo*, FYR Macedonia, and Montenegro are successor states of the former Yugoslavia, declaring their independence in 2008, 1991 and 2006[9] respectively. Since the early 1990-ties, all Riparian countries have gone through successful transition from centralized economies to market-based economies[10] and have Human Development Indices of 0.785 for Albania (Rank 68), 0.814 (rank 50) for Montenegro and 0.757 (Rank 80) for FYR Macedonia. Despite this, public debt in Albania and Montenegro remains high (71 and 68% GDP respectively), while in FYR Macedonia it is at 38.70% of GDP, relatively low compared to its Western Balkan neighbors and the rest of Europe. Unemployment remains high (14% in Albania, 17% in Montenegro and 21.6% in FYR Macedonia) as does the percentage of population living below the poverty line - 14% to 9% and 21% Albania, Montenegro and FYR of Macedonia respectively. The percentage of rural population is 40% in Albania and FYR Macedonia and 33% in Montenegro with urbanization rates of 1.69%, 0.45% and 0.54% respectively. Socio-economic outlook of the Drin Riparian Countries is presented in the Annex 2.

Land Use[11]

12. Forests accounts for 32.83%, scrub and open spaces for 35.58% and arable land accounts for 21.25% of the total area of the Drin basin. Inland waters which include natural lakes, rivers, water reservoirs and wetlands, accounts for 6.4% of the area. Urban fabric and Pastures account for 1.9% and 1.8% respectively.

Country	Urban fabric	Arable land*	Forests	Pastures	Inland waters***	Scrub and open spaces**
Albania	1.43%	17.19%	28.78%	1.50%	5.37%	45.59%
Kosovo	2.41%	41.71%	32.71%	1.54%	0.41%	21.39%
Greece	1.10%	9.83%	25.69%	0.40%	24.52%	38.47%
FYR Macedonia	1.09%	15.43%	38.07%	1.22%	14.93%	29.19%
Montenegro	2.68%	12.37%	36.72%	2.98%	7.86%	37.32%
Total	**1.86%**	**21.25%**	**32.83%**	**1.76%**	**6.67%**	**35.58%**
**** Includes: Arable land; Heterogenous agricultural areas; Permanent crops***						
***** Includes: Scrub and/or herbaceous vegetation; Open spaces w/ little or no vegetation; Mine, dur***						
****** Includes natural Lakes Ohrid, Prespa and Skadar/Shkodra***						

13. The interconnected watershed bodies and the ecosystems and communities of the Drin Basin deliver a steady stream of benefits to its residents. All Drin riparian countries rely on the extended Drin River Basin waters and use of its resources for agriculture, energy, water supply and sanitation, mining and industry, environment, fisheries, and tourism[12].

[7] Ohridsko Ezero (Macedonian); Liqeni I Ohrit (Albanian).

[8] With the exception of Greece which is a developed country, but not included in this proposal.

[9] When the Socialist Federal Republic of Yugoslavia dissolved in 1992, Montenegro joined with Serbia, creating the Federal Republic of Yugoslavia and, after 2003, shifted to a looser State Union of Serbia and Montenegro. In June 2006, Montenegro formally restored its independence from Serbia

[10] See Annex 1 for Socio-economic profile of the Riparian countries

[11] Based on the analysis done in "GEF Project "Enabling Transboundary Cooperation and Integrated Water Resources Management in the Extended Drin River Basin - Thematic Report on Socio-Economics of the Extended Drin River Basin" which uses European Environment Agency (EEA), CORINE (Coordination of information on the environment) from 2012.

[12] Trans-Boundary Waters and Integrated Water Resource Management in the Western Balkans Region, 2007

Climate Change and Flood Risk Context:

14. Climate change is already having an impact and is likely to intensify in the future. According to the national communications to UNFCCC from Albania, Montenegro and the Former Yugoslav Republic of Macedonia, as well as to the report 'The state of water in Kosovo', climate change will have serious negative impacts in the Drin river basin including increased frequency and intensity of floods and droughts, increased water scarcity, intensified erosion and sedimentation, increased intensity of snow melt, sea level rise, and damage to water quality and ecosystems. Moreover, climate change impacts on water resources will have cascading effects on human health and many parts of the economy and society, as various sectors directly depend on water such as agriculture, energy and hydropower, navigation, health, tourism – as does the environment.

15. The DRB countries are increasingly exposed to the impact of climate change. They are experiencing increased periods of extreme heat in the summer months and increased rainfall during the cooler seasons. According to long-term projections, the average annual temperature will increase by 2° C to 3° C by 2050 and precipitation will decrease in the summer, resulting in longer dry periods followed by more sudden heavy rainfalls. This combination increases the likelihood of floods as well as their destructive nature.

16. Historical flood data from the Western Balkans suggests a more frequent occurrence of flood events, characterized by more extreme and more rapid increase in water levels, attributed to an uneven distribution of precipitation and torrential rain, particularly over the last decade. More and larger areas and, therefore, a greater population numbers are being affected by flooding with a strong impact on national economies.

17. In ***Albania***, climate change projections indicate the intensification of heavy precipitation and an increase in the frequency of heavy rains with longer duration, causing flooding and economic damages. There is already evidence of increasing frequency of high intensity rainfall, which is increasing pluvial or flash flooding which inundates the floodplain in a matter of hours. In winter, longer duration rainfall causes flooding which lasts for several weeks during the winter period while long-duration spring rainfall combines with snowmelt to cause flooding. Flood risk is a combination of river flooding and coastal flooding due to sea water inundation (storm surges), both of which are increasing with climate change.

18. According to available climate change projections for ***Montenegro***, there will be a sharp increase in variability of river flow, characterized by increased frequency and intensity of flooding and hydrological drought. In addition, coastal flooding and storm surges will also significantly increase. During this period the area of low air pressure develops in the coastal region of Montenegro and has a wide impact causing maximum precipitation in the southern areas. In the karst areas, during spring, there are periodic floods due to longer periods of precipitation, melting snow and high groundwater levels. Such floods have impacted the Cetinje plain several times and have caused severe damage to the buildings there.

19. The First and Second National Communications on Climate Change for ***FYR Macedonia*** outlined a number of scenarios related to water resources. The findings included a projection of a 15% reduction in rainfall by 2050, with a drastic decrease in runoff in all river basins. Although the long-term projection is for increased temperatures and a decrease in sums of precipitation, the past period studied shows significant climate variability with increased precipitation. The proportion of winter precipitation received as rain instead of snow is increasing. Such shifts in the form and timing of precipitation and runoff are of concern to flood risk.

Flood risk and underlying vulnerability in the individual Drin Basin countries

20. Flood risk in riparian countries of the Drin Basin have been an important disaster factor since 2010, as can be seen in Table 1, the frequency of floods has been observed to be increasing over time. The socio-economic vulnerability is high due to the high (9-21%) poverty rate of the Riparian countries. Poverty and unemployment are particularly widespread in rural and mountainous areas of the basin. Vulnerability factors also include poor urban planning, unsustainable water management and agricultural practices, deforestation, industrial pollution and poor waste management in areas highly exposed to flooding.

Date	Affected areas, municipalities	Extent of Damage
Albania		
Jan-10	Shkodra, Ledhe and Durries	10,000 hectares flooded, over 5,000 people evacuated, 2,200 homes damaged
Nov-Dec 10	Drini and Mati River Deltas, Ulza and Shkopeti reservoirs	15,000 people evacuated, 6,000 km^2 land flooded, 4,800 houses flooded
Nov-14	Tirana, Lezhe, Shkoder and Fier	11,000 people evacuated, 3 people dead, 7500 houses damages
Feb-15	Vlora and Fier, Berat, Elbasan and Gjirokaster Rivers Vjosa, Devoll, Osu, Seman	42,000 people affected
Nov-15	Kukës, Dibër, Durrës, Shkodër, the southern county of Gjirokastër, and around the capital in Tirana district, in central Albania	1 death, 30,000 were left without power, and many without drinking water including residents in the Tirana area.
Jan-16	Tirana, Dibër, Durrës, Shkodër and Lezhë	700 people evacuated, roads blocked after several minor landfalls; homes evacuated because of landslides
Oct-16	Laç, Kurbin municipality Lezhë County and Mirditë, also in Lezhë County; Dibër, Tirana and Korçë	1 death has been reported in the north west town of Laç, Kurbin municipality, Lezhë County. 100 homes looded. At least six families displaced as a result. Crops and livestock damaged.
Nov-16	Dibër county, Durres county, Lezhë county, Kukës county	3 deaths, 80 families evacuated from their homes in Tirana county; Several roads have been closed, including the Tirana-Durres highway, landslides blocked roads, a bridge collapsed near Ujmisht village.
Dec-17	Marikaj and Laknas in Tirana County, Fushë-Krujë in Durrës County and also in Bardhaj, Shkodër County	and schools closed. Over 70,000 homes left without electricity. 5,000 households have suffered flood damage, 600 families forced to evacuate. Over 100 road sections and dozens of bridges damaged, along with infrastructure such as power and water supply stations. Approx. 15,000 hectares was under water. Emergency services have evacuated 200 people after they were trapped inside a flooded shopping centre in Kashar, Tirana County.
Mar-18	Shkodër, Diber, Kukes, Durrës and Elbasan Counties	2,285 hectares of land were under water, 800 inhabitants isolated, Landslides, blocked roads
Former Yugoslav Republic of Macedonia		
Feb-13	River Kojnarka Kumanovo, Stip, Sveti Nikole, Strumica, Valandovo, Ohrid, Probstip, and Kocani	Approximately 6,000 people affected
Jan-Feb-15	Eastern region: River Crna - Region of Bitola Municipalities of Moglia, Novaci and Bitola	Over 100,000 people affected
Feb-15	Southern and central parts of the country	100,000 people affected, Agricultural land, electrical infrastructure, roads, and a large number of homes have been severely affected
Mar-15	municipalities of Kavadarci, Prilep and Kumanovo	farm land
Aug-15	Polog Region of north-western Macedonia	6 deaths (including 3 childern) and 12 injured, Roads and buildings have been damaged, particularly in Shipkovica (damage to buildings due to landslides from the Šar Mountain) and Golema Rechica, lost road access because of mudslides, while the storm had also cause a bridge collapse and the overnight closure of the road to neighboring Kosovo, hundreds of homes and key infrastructure suffered severe damage. Mudslides engulfed local roads and cut off a number of mountain villages.
Aug-16	City of Skopje and suburbs	22 dead and state of emergency declared;major damage to buildings and the road network, including parts of the city's ring road; cars swept away by flood water for hundreds of metres; 70 vehicles had been trapped by flooding in the Stajkovci area; major damage property, including some homes which have been destroyed
Montenegro		
Dec-10	Whole of Montenegro to various extents Rivers Lim, Tara, Moraca, Drina tributaries and Bojana; Lakes Skadar, Piva and Niksic area	21 municiplaities affected, 1.49% of GDP equalling 43 Million Euros in losses
Aug-14		Flooding and torrential rain has also caused landslide in Montenegro. Many towns along the Adriatic coast
Nov-16	Municiplaities of Berane, Rožaje and Petnjica	400 people evacuated from their homes

Table 1: Recorded flood events in the Riparian countries of the Drin Basin since 2010

21. According to Desinventar Disaster database, floods and flashfloods in ***Albania*** account for 15% of deaths and 25% of damage and destruction of houses from disasters in Albania. The years with highest

recorded incidents of hydro-meteorological disaster are 1995, 1996, 2003, 2004, 2005, 2006, 2007, 2010, 2012, 2013 and 2014. In Albania, flooding affects 130 000 hectares of land and is generally pluvial in origin, occurring in the period of November – March, when the country receives about 80-85 % of annual precipitation. The largest floods have occurred in the low western area of the country but small rivers and the torrents cause flash flooding and causes high economic damages. As the urban development of the floodplain increased, the damage caused by flooding also increased. Following the devastating floods of 1962-63, flood defenses were built to the 1% return period in some rivers, but such standards of protection are decreasing due to climate change. In January and December 2010, floods caused major damage and disruption over a wide area. The flooding of January 2010 in the district of Shkodra was at the time considered the biggest emergency event which inundated 10,400 ha of land and about 2500 houses and 4800 people were evacuated. As a result of increasing rainfall, the Drin river flow rapidly increased the water level in three hydropower reservoirs, which were forced to release water, increasing discharge to 2450 cubic meters per second into the Buna River which has a maximum capacity of only 1700 cubic meters per second. The Albanian government declared the flood a "natural disaster" and deployed the army and police forces to help evacuate people.

22. The socio-economic vulnerability to climate change in Albania is centered on 4 sectors: agriculture, water, population and tourism. In the 2010 flood which is the largest on recent record, losses reached nearly 0.15 % of the GDP of the country. The average expected losses per year is estimated to be around 370 million of LeK (3.2 million USD), with a maximum of 4 billion LeK (35.2 million USD) arising from the Shkodra flood in 2010. Hydropower is the main source of electricity in Albania, with supply growing by 45.2% in 2015-2016, mainly due to an increase by about 43.4% of hydropower production, from construction and the operation of several small hydropower plants. The country is therefore heavily dependent on hydrological conditions. The Drin is the longest and largest river in Albania and the dams constructed along its way in the Albanian territory, produce hydropower contributing to around 90% of the total electric capacity in the country. Climate change and the increases in risk of both floods and droughts will impact the hydropower sector in Albania.

23. The Third National Communication (TNC) makes the following recommendations for enhanced management of climate-induced flood risk in Albania: maintain efficiency of water evacuation systems; deepen and manage Drin, Mat and Ishëm river flow so that their waters run to the sea; clean, deepen and maintain primary, secondary and tertiary collectors (canals) and draining systems; install and maintain hydrovores during the entire rainfall season; install high power and efficiency pumps for the evacuation of waters from particularly important structures; continuously monitor canals and pipes for the evacuation of communal and industrial waters; plant fast-growing trees to protect river embankments and to mitigate flood risk and soil degradation, and to contribute to climate change mitigation; increase professionalism and efficiency of rescue units (training of existing and new staff); strengthen the role of regional emergency and civil protection units.

24. Historic data on flooding in **Montenegro** shows that in the period 1979-1997 there were 5 major flooding events; but in the six years, 2004-2010, floods occurred 6 times (and twice in 2010-January and November - December). Floods are the most frequent natural hazard. Intensive precipitation and snow melting in the northern part of Moraca basin, combined with high tide in Buna/Bojana river due to the strong south wind and high discharge of Drin resulted in the increase of the water level in Shkoder/Skadar Lake (10.44 m a.s.l.) in December 2010. The December 2010 flood resulted in unprecedented water levels, extent of flooded areas and damages. Total country-wide damages and losses exceeded € 40 million (1.3% of GDP), impacting largely rural areas. Transport routes, electricity supply and communication lines between the northern region and the rest of the country were obstructed for a certain period of time and 1.5% of the population had to be evacuated. Flood damages in areas Golubovci and Tuzi to the north of Shkoder/Skadar Lake reached an amount of ~2.14 million euros (1.462.500 euros on construction objects and 682,800 euros in agricultural crops). An assessment undertaken by FAO of the 2010 floods, estimated that around 30 000 hectares of agricultural land was flooded. The most severely affected was the area around the Zeta river valley and the area around Lake Skadar, specifically the territory of Golubovci, where most of the national vegetable production occurs. Total damages and losses were estimated at over € 13 million, of which over € 6 million in damages and over € 7 million in losses.

25. Given the geo-morphological characteristics of the territory of Montenegro, floods could jeopardize settlements, agricultural areas, forests and other land and transport routes in river plains and valleys.

Vulnerability to flooding in Montenegro is due to the location of many towns and settlements on large river banks which makes them potentially more vulnerable to the overflow of water from watercourses. Around Skadar Lake and the Bojana River, as well as on the Cetinje and Nikšić plains the large areas of agricultural land, assets and urban zones are susceptible to flooding from all sources, including groundwater. Over 60% of Montenegro's territory is comprised of carbonate rock. One of the problems facing karst terrains in Montenegro is frequent flooding in karst fields and in the plains of the Zeta Valley, the area surrounding Skadar Lake, and along the courses of the Bojana and Lim Rivers. Extreme floods were registered in late 2010 in the Zeta Valley and along the course of the Bojana River, with maximum levels in Skadar Lake of 10.44m. The floods were exacerbated by reservoirs in Albania (Vaus Deis, Kumana, Fierza), that released approximately 3,000 m^3/s of water into the Bojana River which has a capacity of around 1,700 m^3/s, while the overall flow from the Skadar Lake Basin was around 7,000 m^3/s.

26. Since 2002 storms and flash floods have become more frequent in ***The Former Yugoslav Republic of Macedonia*** and are causing considerable damage. The severe flooding that hit much of the country in January and February 2015 caused widespread damage and economic losses in 44 municipalities. Frequent floods occur in the Ohrid coastal zone (Crn Drim basin) that, because of the importance of the region from ecological and tourism points of view, is considered significant. For managing the water level fluctuation and controlling the flooding of coastal area, a regulating gate has been established at the Crn Drim river outflow in Struga.

27. The two National Communications proposed the following priority measures for adaptation to climate change in the water resources sector and flood risk management: modernization of the hydro-meteorological network; improvement of data availability and the establishment of data monitoring and processing; rehabilitation and reconstruction of existing hydropower and water management structures and systems; development and implementation of effective water management plan; implementation of priority measures related to water supply and irrigation systems, flood and drought control, as well as protection strategies for controlling erosion and sedimentation; restriction of urban development in flood-risk zones; measures aimed at maintaining dam safety, afforestation and other structural and non-structural measures to avoid mudflows; construction of dikes; adjusting operation of reservoirs and lakes (e.g. multiple use of reservoirs to include flood alleviation); land use management; implementation of retention areas; improve drainage; structural measures such as temporary dams, building resilient housing and modifying transport infrastructure; migration of people away from high-risk areas.

28. The Third National Communication highlights the need for the country to continue accumulating experience to cope with droughts and floods and make best use of existing technologies in water supply and irrigation used in the country. To coordinate these measures more effectively, the report recommends steps be taken to enhance the role of the National Climate Change Committee. The TNC also emphasizes the need for transboundary cooperation to increase the resilience of water resources shared with other countries. Such cooperation will further create opportunities for sharing knowledge and experience and will allow for the exploration of more cost-effective measures. Legislative, regulatory and economic measures can all benefit from a joint transboundary approach.

Indicative flood hazard of the Drin Basin

29. As part of the project preparation, very crude 2D flood hydraulic modelling has been undertaken for the Drin basin using the ALOS Dem for the basin and routing floods of different sizes through the basin sub-catchments. The maps below show the indicative flood map for the 2,500, 3,000 and 7,000 cumecs floods routed through the basin. The indicative maps show that there is extensive flooding on the White Drin in Kosovo*, extensive flooding in the Struga area around Lake Ohrid in Macedonia, and high risk areas all along the valley of the black Drin affecting several settlements in the relatively narrow floodplains there. In the downstream part of the basin, in the Lake Skadar area, there is extensive flooding, which affects the concentration of settlements there, in both Albania and Montenegro. The difference in depth of flooding in the middle and upper parts of the basin is 2- 6m between the 3,000 and 7,000 cumecs floods while in the downstream the extent of flooding (hence numbers affected) is significantly different between flood events, and the difference in flood depths at any given location could vary by up to 4m. These indicative maps do not include other sources of flooding such as groundwater, torrential, pluvial and coastal flooding which will also need to be taken into account in flood hazard and risk modelling and mapping during implementation. It has not been possible to calculate the numbers or people affected by floods of different sizes, as the

population data for settlements is missing. This and other receptor information will need to be addressed by the project.

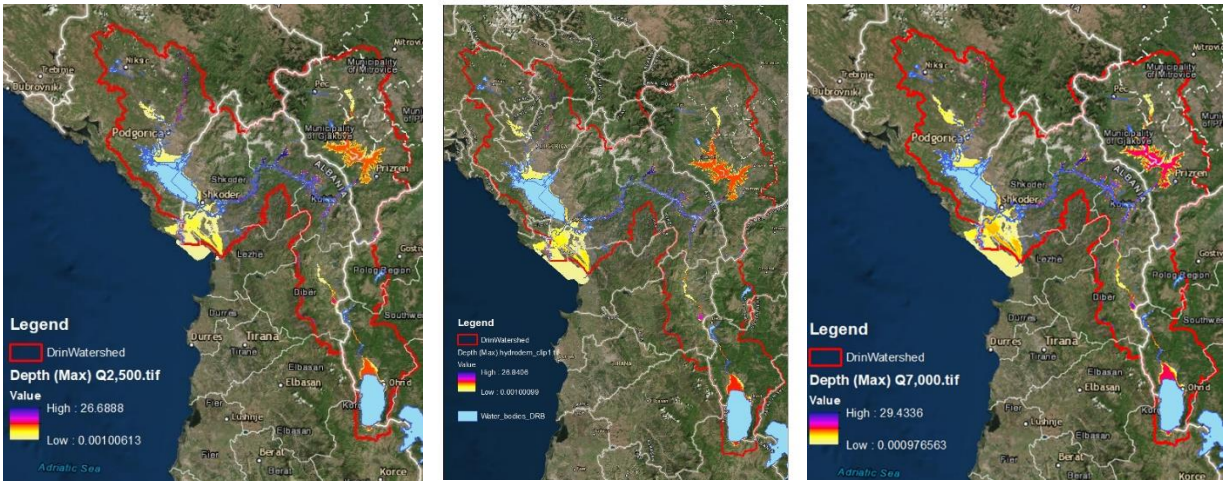


Figure 2: Indicative flood map of the Drin for 3000 cumecs maximum discharge

30. In addition, the GIZ project has produced Preliminary flood Risk maps for the basin which is largely based on areas that have experienced flooding in the past. It does not include climate change, or any other possible futures.

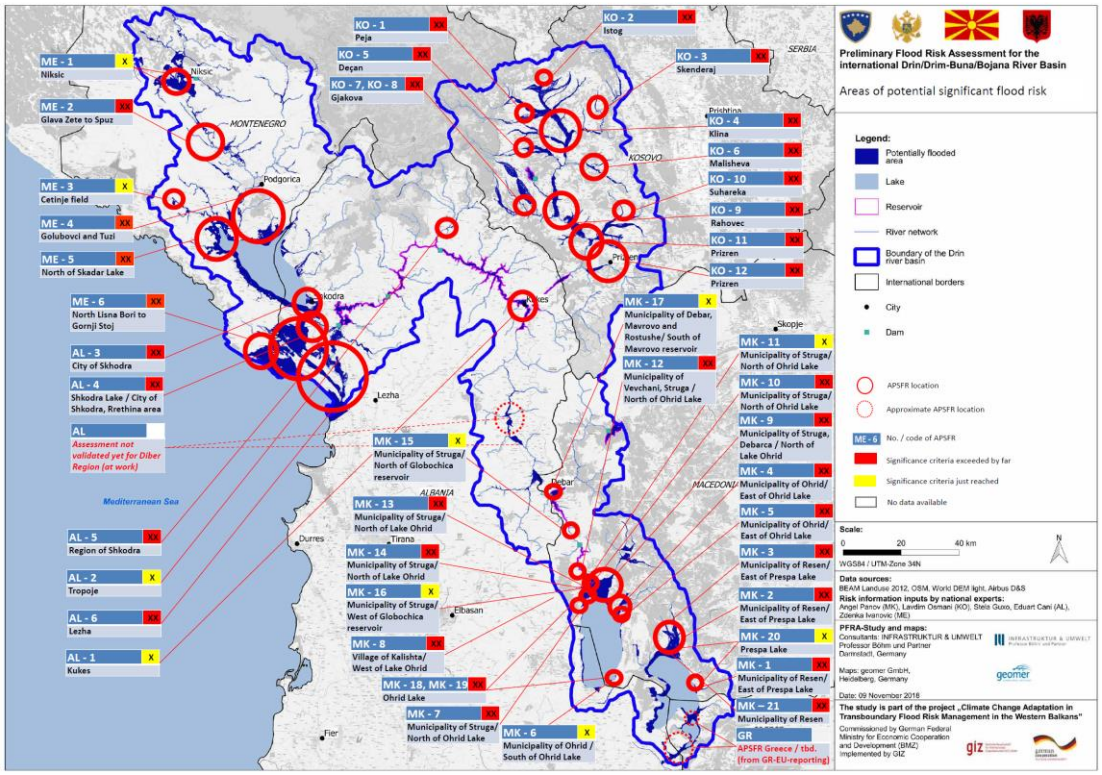


Figure 3: PFRA map of Drin Basin – showing areas of potential significant flood risk

Non-climate drivers of vulnerability

31. The impacts of climate-induced flooding are exacerbated by the anthropogenic pressures including rapid urbanization and unplanned development in the floodplain; deforestation; poor solid waste management; unsustainable use of land and water resources; intensive agriculture, forestry and mining activities; unsustainable tourism. Diverse and often conflicting uses and unsustainable management

approaches applied in the Drin Basin exert severe pressures on the Basin's ecosystems leading to their degradation. Some of these key pressures are: solid waste & marine litter; wastewater; unsustainable use of water resources; hydro-morphological interventions including the construction of dams; extraction of minerals/mining; intensive agriculture and forestry; uncontrolled and often illegal fishing and hunting; erratic land use and urban development; unsustainable tourism; increasing climate variability. These pressures lead to a wide range of impacts such as: deforestation, pollution of surface and ground waters, accelerated soil erosion; salinization and salt water intrusion; loss of valuable ecosystems and biodiversity; greater exposure to floods; increasing health risks, and increased flood risk. These non-climate factors are being analyzed and addressed in the sub-region through a regional GEF supported project "Enabling Transboundary Cooperation and Integrated Water Resources Management in the Extended Drin River Basin" (GEF Drin Project) implemented by UNDP that supports the implementation of the Drin MoU for the coordinated management of the Drin Basin. However, the GEF-supported project and the on-going baseline sub-regional initiatives cannot comprehensively address climate change adaptation needs of the riparian countries and establish a comprehensive basin level climate risk and flood risk management, which needs to include: (1) exchange of flood risk knowledge and climate information; (2) basin level climate change adaptation and flood risk management strategy and plans; (3) combination of structural and non-structural flood risk reduction interventions; (4) institutional capacity.

32. Some of the key drivers are discussed in more detail below.

Erosion and Sedimentation

33. Erosion is an important and complicated issue in the Drin River Basin, which contributes significantly to increased flood risk. Among the causes of erosion and sedimentation are over-grazing, logging, forest fires, unsustainable agricultural practices including inappropriate irrigation methods and agriculture in steep slopes, changes in flow regimes (e.g. due to dams, see below) and gravel extraction along the rivers and their tributaries. Soil erosion is resulting in significant sediment loads transported into the lake of the Hydro-Power Stations of the Drin which could reduce their storage capacities. Increased sediment loads entering both Lakes Micro and Macro Prespa, has resulted from deforestation and overgrazing in both Albania and The Former Yugoslav Republic of Macedonia, and unsustainable agricultural practices in The Former Yugoslav Republic of Macedonia.

34. The main problem in terms of excessive sediment loads entering the Lake Ohrid lies mostly with the diversion of the Sateska River to the Lake in The Former Yugoslav Republic of Macedonia, deforestation in the watershed of Sateska, which has resulted in erosion of the riverbed, and illegal extraction of sand and gravel from the riverbed which has changed flow regimes and caused the increase of sediment loads entering the Lake. Overall, the load of silt entering the Lake Ohrid is large. A delta including a small island has been formed into the lake at the river mouth. Increased sediment loads into the Black Drin River in The Former Yugoslav Republic of Macedonia, is a result of uncontrolled grazing and logging. Illegal gravel extraction from rivers in the Black Drin catchment lead to disturbance of the sediment and the habitats and has an effect on the river flow patterns causing erosion of the adjacent land. The changes of the shape of the river channel undermine infrastructure, bridges and roads, and productive land.

35. In parts of the Buna/Bojana Delta the progression of the sea along some parts of the coast at the Buna/Bojana mouth has been about 500 m since 1936 and about 50 m the past 20 years. The morphology of the Buna/Bojana deltaic complex is believed to be affected by a combination of factors. Alteration of the water flow regime in the Drin–Shkoder/Skadar–Buna/Bojana system due to the construction of the cascade of dams on Drin, entrapment of sediment in the upper part of the watershed by the dams, reduction of the sediment transport capacity of the Drin in combination with the natural low gradient of the channel of Buna/Bojana River resulting in the deposition of alluvium (coming from erosion in the tributaries of Buna/Bojana and Drin) preventing this from reaching the Buna/Bojana mouth at the Adriatic Sea. The sediment deposition in Buna/Bojana River causes reduction of the speed of water and hence deposition of sediment, variability of the wave activity and sea level in combination with short-term events (storm waves and tides) and long-term processes (sea transgressions).

Unsustainable forestry management and deforestation

36. Illegal and indiscriminate lodging for commercial purposes, extensive collection of firewood, uncontrolled grazing coupled with poor forest management, has resulted in the deterioration of forests in most parts of the Drin Basin including the Ohrid sub-basin.

37. In Prespa it is estimated that 50% of the forests are significantly degraded and in some cases the natural regeneration capacity of the forest has been lost. The declining trend of livestock is a positive development with regard to pressures related to grazing. The sub-sequent erosion has been a contributing factor for the destruction of the wetlands in Micro Prespa Lake. Nowadays, the remaining high forest habitats and undisturbed grassland in the Prespa National Park are very limited. Important habitats of several animal species (e.g. Lynx lynx, Rupicapra rupicapra) have been fragmented and degraded.

38. In Lake Ohrid sub-basin habitat fragmentation and loss constitute a threat to mammals, some of which are either threatened with extinction or are classified as vulnerable.

39. In the Black Drin, damages are more severe in the Lura National Park and Luzni-Bullaci Reserve. Habitat fragmentation and loss is an issue across the drainage basin. The Diber, Kukes, Puke and Malesia e Madhe Regions in the Drin watershed host the largest areas of forest in Albania and they play a critical role in flow regulation and prevention of erosion. In addition, poor management practices (e.g. intensive timber production and firewood, over-harvesting of rare medicinal plants, with only limited attention to ecosystem management) have led to direct impacts on biodiversity depending in woodland habitats and increased erosion.

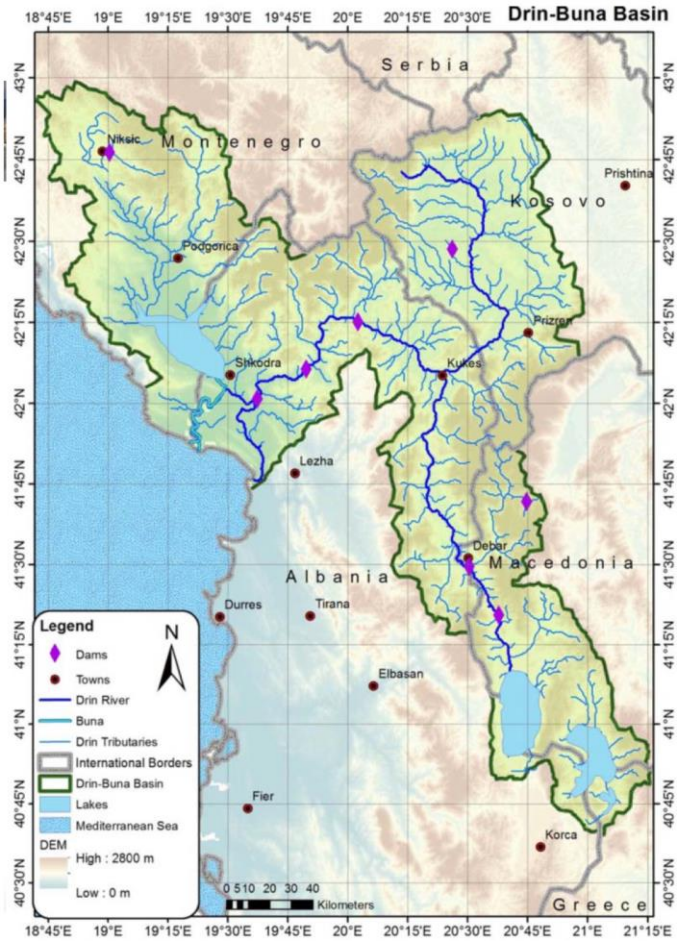
40. In the Lake Shkoder/Skadar Basin on the Montenegrin side, in addition to indiscriminate logging, frequent seasonal fires contribute to deforestation.

41. Alterations in land use also affect directly forests. For instance in Buna/Bojana the natural forests along the seashore are threatened or already damaged by constructions. In The Former Yugoslav Republic of Macedonia forests have been managed more successfully; although still focused on resource production, timber and firewood. Ecosystem values and watershed management considerations are not incorporated as major management objectives. There are on-going efforts to alter this approach e.g. in the Galicica Park in the Prespa sub-basin. In Ohrid and the Black Drin cutting is regulated and reforestation is practiced; there has been some concern with regard to the species used in this regard. Reforestation has significantly reduced erosion; nevertheless, there are still areas that require attention, especially in the Sateska watershed.

Dams on the Drin

42. There are more than 110 irrigation reservoirs in Drin River Basin. There are five big operational hydropower plants on Drin River: Globocica and Shpilje with a total installed capacity of 126 MW, Hydropower Plant (HPP) “Fierza” HPP “Koman” and HPP “Vau i Dejës” with a total in-stalled capacity of 1350 MW. Furthermore, a concessionary contract has been concluded for “Ashta” hydropower plant on Drin river with an installed capacity of 48.2 MW. There are currently 22 small Hydro-power Plants (SHPPs) in operation. The dams have changed the hydrological, hydraulic and sediment regime of the river considerably.

43. Due to the retained volume of the dams the overall hydrological regime changed for low flow and small flood events (1-10 years). Small flood events are particularly important to maintain the dynamic braided river zones and its specifically adapted flora and fauna. There is no evidence that the dams change extreme flood events, however the magnitude of impact can be more dangerous further downstream after releasing large flood waves. Due to the retention volume it is estimated that floods of about 5,000 m³/s can be reduced to about 2,000 m³/s downstream of the last dam (if the dams are not filled with water). The sediment regime is also considerably impacted by the presence of the dams due to the retention of coarse substrate, mostly gravel and bedload in the reservoirs although there is no data on this effect. Typically, dams on gravel reaches can show decrease of bedload transport after construction of dams of up to 90% with only suspended load being transported during flood through the dams. This results in significantly reduced coarse sediment transport and limits the erosion forces of the channels, which is further exacerbated by missing small flood events (1-10 years). This lack of sediment in the Bojana-Buna delta over time is increasing coastal erosion and salt water intrusion.



44. The Hydropower dams in the Drin basin and their reservoirs are of great importance to the economy of the riparian countries. They are the main sources of electricity in Albania and contribute to electricity production in the Former Yugoslav Republic of Macedonia. Albania's internal electricity generation capacity of about 2,100 megawatt (MW) is entirely dependent on hydropower. There are three power plants in the Drin River cascade: Fierza, Komani and Vau Dejes with total installed capacity 1,350 MW, generating about 70 percent of total supply. In an average hydrological year, the Drin Cascade generates about 4 billion kilowatt hours of hydroelectricity. The Drin Cascade, plays an important role in Albania's objectives to increase regional power connectivity, decrease future dependence on thermal power supply and create a Regional Power Market in South Eastern Europe. Hence, extension of the operating life of the three HPPs along the Drin cascade is not only a safety concern, but also a potential revenue management source for the Government in the future[13]. In the Former Yugoslav Republic of Macedonia the two dams on the Black Drin River represents 20% of the total installed hydropower capacity (accounts for 16% of the overall energy production). A considerable number of small HP plants in the Black Drin watershed in The Former Yugoslav Republic of Macedonia, are either planned or are in the "pipeline", one of which involves the diversion of a part of the flow of Radika River to the Vardar River (that flows in the Aegean Sea). This has raised concerns on the Albanian side.

45. Hydropower production is also linked to oscillations of the water level in the lakes Ohrid and Shkoder/Skadar, that impacts their ecological, economic and cultural/recreational value. Variations in the water level in Lake Ohrid is linked with the operation of the Spilje and Globocica dams and the associated HP production stations downstream in The Former Yugoslav Republic of Macedonia, and with extreme precipitation incidents. Hence, floods in the Ohrid Lake sub-basin are closely associated with Lake Ohrid oscillations. Permanent decrease or significant oscillations in the water level may lead to the shift of littoral

[13] Additional Financing to Energy Community of South East Europe APL Program APL 5 for Albania Dam Safety http://documents.worldbank.org/curated/en/426051527478225166/pdf/Albania-Dam-Safety-PP-05082018.pdf

zone habitats and/or deterioration or even elimination of the wetlands hence, deterioration of biodiversity. Commercial fishing will also be negatively affected since these habitats provide the spawning grounds for four commercial species, including the endemic Ohrid trout (Salmo letnica) – currently under protection in The Former Yugoslav Republic of Macedonia - and the smaller size Belvica species (Salmo ohridana). A lack of close coordination between Albania and The Former Yugoslav Republic of Macedonia with regard to the management of the outflow from the dams in both countries is an additional factor which has contributed to flood risk in the past.

46. During 2010, the reduction of the flow of water from Ohrid to Black Drin in The Former Yugoslav Republic of Macedonia was used as a measure to mitigate floods in the northern part of Albania -in the Shkoder/Skadar Lake sub-basin- which led to increased water level in the Lake Ohrid which in turn negatively affected the sewage system and natural environment. Furthermore groundwater flooding was observed in settlements near the Ohrid Lake and Black Drin River. Changes in the flow regime both upstream and downstream of the dams affects the habitats in the Black Drin River and changes in the erosion patterns in the river bed and banks. Deforestation in the Jablanica Mountain in FYR of Macedonia is also increasing flows and exacerbating flooding downstream. Some floods that have been observed in Albania on the border with The Former Yugoslav Republic of Macedonia are attributed to the increase of the discharge from the last dam in The Former Yugoslav Republic of Macedonia.

47. The outflow of the Lake Shkoder/Skadar through Buna/Bojana River is occasionally impeded due to increased flow of the Drin River, caused by water releases from the HPP reservoirs upstream. Depending on the releases from the upstream HPP (Vau Dejes), which depends on both precipitation and electricity demand. Changes in oscillation of the water level of Lake Shkoder/Skadar exert pressures on the ecosystems and the microclimate as well as on the agriculture around the lake.

48. Climate change and variability leading to the increase of the frequency of extreme precipitation events, as well as the operation of the Drin dams under changing climatic conditions, need to be taken into consideration when examining the changes in the flooding regime of the Drin Bain, and its important lakes, in order to understand and mitigate risks to flooding, biodiversity, habitat, economic damages and cultural/amenity impacts on the natural lakes.

49. Dams, by their very nature, create risks, which may increase substantially under climate change. Poor maintenance could lead to reservoir sedimentation which would reduce flood storage and change channel morphology and can thus exacerbate flooding. Poor maintenance or catastrophic hydrometeorological events could ultimately lead to catastrophic failure or breaching of dams, and this risk will increase with climate change.

50. If properly operated and managed within a climate risk informed basin-wide flood risk management framework, the reservoirs and dams of the Drin basin could be used for seasonal and long-term regulation of river flow and can have a positive effect on managing river flooding. The Hydropower sector will therefore be an important stakeholder as well as beneficiary of the climate risk information and basin level climate risk management that the project will implement. A 2016 study[14] undertaken on the KESH reservoir cascade in Albania using simplified reservoir flood routing, inundation and energy production modelling, found that by using a “flood peak reducing” operation of the Fierza Komani, and Dejes reservoirs cascade, a reduction of flooded areas of up to 28% for forests, 15% for roads, 12% for buildings, 10% for arable land, 9% for mixed use land and 7% for livestock land could be achieved for floods with a probability of 20 years. These was approximately half the risk reducing effect for floods of 100 and 1000-year return period. KESH as the energy producer has the obligation to produce as much energy as possible to meet the demand of the energy market in Albania. Hence, from a company perspective, a “flood peak reducing” operation of the cascade might not be in line with their overall objective. However, such an operating regime resulted in a 1.9%, 1.3% and 0.3% loss in energy production, respectively, which is low compared to production losses due to natural water variability (22%) and changes in production. The operation of hydropower dams and reservoirs within the basin will be included in the flood risk assessment, modelling and mapping. Based on climate risk information, the project will assess the current and long-term ability to operate dams in a flood alleviation role under climate change. This will require the involvement of dam owners and operators in the development and eventual implementation of the overall flood management plan for DRB, and the

[14] Potential of multipurpose-use of the hydropower reservoirs of the Drin cascade in Albania

development of individual operating rules for each dam during floods, which enhances the dam safety requirements, and which also fits into the DRB basin flood management plan. This will therefore involve optimization of the dam operations for multiple uses including power generation, flood alleviation and dam safety. At the very least, it should be ensured that dams are operated in a manner which avoids exacerbation of the flood risk, and which takes account of the increasing risks they pose due to climate change.

51. The engagement of the dam owners and operators will be sought actively at the project preparation phase and then later during the project with the aim to have them closely and extensively engaged in all activities to which they can contribute. A stakeholder analysis will lead to the development of a stakeholder engagement and communication plan during the project implementation. The engagement and communications plan will highlight to the hydropower companies the potential benefits from their participation in the activities towards enhanced flood risk management supported under the project e.g. optimization of dams' operation taking into consideration climate change as well as the operation of cascade of dams in neighboring Riparians. As the hydropower companies are among the most important stakeholders, the project will strive to include them in the consultations and discussions with national authorities towards the empowerment of the institutional arrangement through the Expert Working Group on Floods which has been established in the framework of the Drin Core Group, for effective flood risk management. In addition, in developing risk financing mechanisms the project will seek to engage the private sector including the hydropower sector and will conduct willingness-to-pay surveys and detailed consultation, to better understand how the hydropower (and other sectors) can contribute to and benefit from, comprehensive basin FRM.

Existing legislative and institutional framework and technical capacities for flood risk management in Drin Riparian countries

52. A recent review[15] of the institutional and legal framework for water management in the DRB found that national legislation is not fully aligned with the EU Acquis; there is high fragmentation of competencies, overlapping/conflicting responsibilities of institutions; no basin management plans addressing climate risks; limited monitoring; non-reliable, non-harmonized and limited sharing of data among institutions within and between countries; no basin water cadaster; water management investment was not supported by robust analysis, no investment plans and no comprehensive financial risk transfer mechanisms. The report recommends: (i) alignment of the national legislation with the EU Acquis, especially EUFD; (ii) clear assignment of responsibilities among institutions; (iii) strengthened mandates of local government; (iv) drafting and implementing river basin management plans (RBMPs) and flood management plans based on flood risk maps; and (v) cooperation among DRB countries on FRM preventing and responding to floods through co-development of flood management plans based on comprehensive flood risk maps.

53. There is currently no formal basin level flood risk management in place for the Drin basin but the current practices in each Riparian country which constitute the baseline for FRM for the Drin Basin has been elaborated. In addition, there are bilateral agreements between Riparians which include cooperation on water management, as well as informal arrangements, which are described below.

Albania

54. Water Management falls under the responsibility of the National Water Council, chaired by the Prime Minister, as the highest authority for water policy-making. In its effort to ensure a comprehensive cross sectorial water resources management the Government established in January 2018 the Agency for Water Resources Management with central and local presence. The councils for basin management are turned into offices for basins management.

55. ***National Hydrometeorological Service*** in Albania was set up in 1949 with a limited number of the stations mainly comprising water level monitoring of the country's main rivers. The network was gradually

[15] Flood Prevention and Management – Gap analyses and needs assessment in the context of implementing the EU Floods Directive", September 2015, funded by the Wester Balkans Facility Infrastructure Project, Technical Assistance 4 (IPF 4)

expanded over time and in 1962, the Hydrometeorological Service became the Hydrometeorological Institute and in 1972 it became part of the Academy of Sciences of Albania. By the 1990's the Institute had more than 90 staff including more than 20 technicians dealing with this activity and observation data processing. After 1990 the NHMS was seriously damaged and the number of the stations was reduced. In 2008, within the framework of the reform of science merges and reduction in the number of the research institutions occurred and the former Hydrometeorological Institute now Institute of Geoscience, Energy, Water and Environment is placed under the Polytechnic University of Tirana and IGEWE was significantly reduced in all aspects. Currently it has 12 personnel and no technical staff (for maintenance, monitoring and data processing). The last hydrological yearbook dates in 1987. The number of existing hydrological stations located in the Drin Basin (River Drin and tributaries) in Albania is about 52. Nine of them are located in the Buna catchment. A former World Bank project supported digitization of 10-year meteorological and 20-year of hydrological observations (paper) data the identified missing data sets are being digitalized by the EU supported project. Currently there are 76 meteorological and precipitation stations existing in the Drin Basin. IGEWE produces a general forecast for 24 hours, and a 3-, 5- and 10-day outlook. IGEWE`s operational forecasting is based on use of printed analysis and forecast products from international forecasting centers and from the Montenegrin National Meteorological and Hydrological Service (NMHS). KESH[16] have set up its own monitoring network, which is not accessed by the NHMS.

56. ***Disaster Risk Management and EWS*** in Albania was supported by the EU ProNews project, implemented until the end of 2017, which has been working with the Ministry of Defence, Directorate for Civil Protection (CP) and Prefectures. Prefectures are responsible for civil protection at local level and responsible for Emergency Planning. ProNews project financed the improvements in the EWS for flood prevention. Under Component 1 - Emergency Planning and Improvement of civil protection and EWS FRM legal frameworks – the project worked at local and national levels, unified all emergency plans taking into account national and international legislation. Under Component 2 the project developed flood hazard maps for areas potentially susceptible to flood risk, based on the flood susceptibility index. The work didn't include modelling or climate change. The hotspots for future hazard mapping were identified. Under Component 3 the hydrometric stations were installed, and data management systems for EWS were established. Forecasts are based on EFAS[17], ECMWF[18], WMO[19] partners. Digitization of historical data was also undertaken. World Bank project (2011-13) upgraded the hydrometric network and data management, installing 40 stations across Albania. Stations have not been maintained since installation. WMO with IGEWE conducted assessments of all stations and identified needs for civil works, additional sensors, etc. The 40 stations are owned by CP (not IGEWE) although CP has no legal mandate to own the stations. IGEWE uses the data but do not have capacities to maintain them and cannot legally do maintenance.

57. The first ***EWS and forecasting*** platform was created for Albania in 2010. It included radar for now casting and established a database for historical losses and damages (in 2013 DesInventar was implemented and is maintained by CP). Awareness raising programmes for cities (Shkodra, Tirana and Vlora) have been established and FLOODIS[20] App for EW developed, which allows users to send pictures and reports of flooding to CP which can be used with Google Earth layers and in EWS platform. Legal improvements of CP law were completed in March 2018 and are currently under consultation. A National law on EWS is being developed.

[16] The Albanian Power Corporation (Albanian: Korporata Elektroenergjitike Shqiptare - KESH) is the largest electricity producing company in Albania. KESH operates the most important electricity generating plants in the country. They include: The Drin River Cascade hydropower plants (Fierza HPP, Komani HPP and Vau i Dejës HPP), with an installed power capacity of 1,350 MW, and the Vlora TPP, with an installed power capacity of 98 MW. The cascade, built on the Drin River, is the largest in the Balkan region by installed capacity, as well as by the size of the hydropower plants.

[17] European Flood Awareness System

[18] European Centre for Medium-range Weather Forecasts

[19] World Meteorological Organisation

[20] More detail is provided here: http://www.bedrin.eu/be-drin-blog/59-floodis-application-in-shkodra-the-be-drin-synergy-with-unesco

58. The former Technical Water Secretariat now the Agency for Water Resources Management has developed a costed national action plan for water management which includes the following goals relevant to flood risk management:

a. Goal 11 - Reducing the risk of flooding for the loss of life threatening residents, damage to economic assets, public works, cultural assets and environmental values of people, businesses and communities
b. Goal 12 – Dam rehabilitation and maintenance in accordance with technical requirements, according to International Commission on Large Dams (ICOLD)'s recommendations aiming at increasing safety and reducing the possible effects caused by their injury.

59. The ***Flood Risk Management Plan*** for Shkodra region 2012-2018[21] aims at improving Flood Risk Management (FRM) focusing on non-infrastructure measures, such as warning systems, preparedness and spatial planning. This includes consideration of all types of measures for preparation, disaster management and recovery phases, as well as the development of a regional flood risk management framework that includes local flood risk management plans. The plan does not include climate change considerations.

60. ***Climate Change Adaptation:*** Recognizing that reducing Albania's vulnerabilities to climate change requires greater investments and greater integration of Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) into on-going development programs, the Government took strides to start to coordinate climate adaptation efforts at the national level. The Council of Ministers decision no. 155 (2014) called for the establishment of an Inter-Ministerial Working Group on Climate Change (IMWGCC). This body led the finalization of the Third National Communication to the UNFCCC. This body is chaired by the Deputy Minister of Environment and includes representations from all line ministries. This body has the mandate to draft policies related to climate change, promote institutional coordination across ministries, and contribute to UNFCCC processes on behalf of Albania. The role of the IMWGCC was further reinforced through the official launch of the National Adaptation Process in 2015. In its effort to ensure a comprehensive cross sectorial water resources management the Government established in January 2018 the Agency for Integrated Water Resources Management with central and local presence.

Montenegro

61. In Montenegro the Ministry of Agriculture and Rural Development (MARD) and its Directorate for Water Management is in charge of operations related to water management policy, water supply and exploitation, protection of water against pollution, planning of water and water courses and protection from the flood effects. The Ministry is responsible for transposition, implementation and enforcement of all water-related EU Directives in the country. The Water Administration is a body with executive powers under the MARD, responsible for the implementation of water legislation. There is also a Water Council, which has an advisory role to the MARD. Other institutions devolved with responsibilities in the water sector in the country include: Ministry of Sustainable Development and Tourism; Agency for Nature Protection and Environment; Ministry of Health; Ministry of Interior; Ministry of Economy; etc.

62. Protection from water related hazards and disasters in Montenegro is the responsibility of the Ministry of Agriculture and Rural Development (Directorate for Water Management) and Water Administration in cooperation with the Directorate for Emergency Situations of the Ministry of Interior, the Institute of Hydrometeorology and Seismology, the Agency for Nature and Environmental Protection, municipalities and other legal entities entrusted with, or in charge of maintaining the facilities for protection against water related disasters. Reports on the hydrological situation, warnings and forecasts produced by the Institute of Hydrometeorology and Seismology are communicated to the Head of Department for protection from water related hazards.

63. The ***legislative and policy framework*** for flood risk management is comprised of a number of sectoral laws, policies and strategies including the following:

(i) *The Law on water*, which requires the Directorate for Water Management and the Ministry of Agriculture and Rural Development, to develop an annual operational plan for the protection against

[21] Developed in the frame of the project "Climate Change Adaptation in Western Balkans" Implemented by GIZ

water related hazards, which includes preventive works and measures in the period of high waters for protection from floods and erosion; method of institutional organization of protection; duties and responsibilities of the manager for protection; method for monitoring and recording data; method for early warning.

(ii) The laws on “Hydro meteorological services” and on “hydrographic services” define the tasks of the Institute for Hydrometeorology and Seismology of Montenegro of Montenegro (IHMS).

(iii) *The Law on protection and rescue* establishes the legal framework for the development and strengthening of national capacities to combat the harmful effects of natural and other disasters, the role of regional and international cooperation with regard to prevention and mitigation activities, and the rights and obligations of municipalities in the area of protection and rescue. It also includes the collection and consolidation of data on potential risk, the establishment of information and early warning systems and the implementation of preventative activities, such as risk assessments as well as the development of protection and rescue plans.

(iv) The Water Management Strategy for the period 2016-2035, which emphasizes the importance of risk assessment as part of the management of flood risks and flood control measures and the need to include climate change and its impacts on water flows, surface and groundwater that contribute to flood risk. It includes various goals to reduce the risks of floods and its adverse impacts including effective and coordinated action for flood protection, efficient and continuous monitoring and forecasting of floods, regular maintenance and control of watercourses, drainage, anti-erosion protection and soil conservation.

(v) *The Strategy for Disaster Risk Reduction (DRR) with Action Plan for the period 2018-2023* is aimed at reducing the disaster risks and their main causal factors, proper land management and environmental protection, lowering exposure to hazards as well as vulnerability of people and property and improving overall preparedness for disasters.

64. Montenegro recently signed a bilateral agreement with Albania - *Framework Agreement between the Council of Ministers of the Republic of Albania and the Government of Montenegro on cooperation in the field of Transboundary Water Management*, to develop direct and long-term cooperation in the field of water management. The agreement relates to waters of common interest, interventions in facilitating the management of water facilities (of which the hydroelectric power plant and plans for the management of the Skadar Lake, the rivers Drim, Bojana and Morača rivers are of particular importance), activities and events that have or can, from the water management point of view, have an impact on water, water facilities and water use devices, in particular: 1) water balance; 2) protection against water related hazards and disasters; 3) water treatment and maintenance; 4) protection of transboundary waters against pollution; 5) use and management of common water facilities; 6) use of all waters of common interest (of which the waters of Skadar Lake, the rivers Drim, Bojana, Moraca, Grncar and Cijevne are of particular importance); 7) research into the impact of interventions on water management activities on the environment; 8) exchange of opinions, information, consultation and exchange of experiences and cooperation at regional and other levels of organization and networking in the area of water.

65. The Institute of Hydrometeorology and Seismology ***(IHMS)*** in Montenegro is under the Ministry of Sustainable Development and Tourism. It consists of six different sectors which are subdivided into departments. The IHMS has clearly defined organizational structures and responsibilities. About 12 hydrological stations are located in the Drin Basin in Montenegro. The main parameters measured are water level and water discharge, in some of them water temperature as well. Analysis of water quality is done according to the Water Law by IHMS / Sector for Analysis of water and air quality. Analyses are done every year on all water bodies in Montenegro (rivers, lakes and sea), following the Annual programme prepared by Water Administration. Altogether nine stations are actually in operation, all of them are online stations with automatic data transmission. The IHMS has a responsibility to produce non-scheduled meteorological and hydrological information and warnings in situation before disasters; organize emergency observation and measurement of the hydrological stations profiles and provision of emergency information; monitor weather and waters; collect and analyze data; prepare forecast; inform and alert responsible agencies. The Institute for Hydrometeorology and Seismology of Montenegro issues information on status and weather forecasting, climate and water in the text form, in writing, in the form of tables, charts and graphs through networks of electronic or postal traffic, or in the print and electronic media in the form of regular press releases. The hydrometric network of Montenegro is well developed and is receiving further upgrade and rehabilitation from various projects. Funding is already secured for the installation of 20 new meteorological and hydrological stations which will increase the network from 30 to

50 stations across the country, i.e. in Adriatic and Black Sea basins. While this will nearly complete the required network, some additional stations are required, particularly in the Drin sub-basin. In addition, the O&M plan including the O&M financing plan is not developed for the new stations and needs to be addressed.

66. The IHMS has been involved in the basin-wide ***flood forecasting and early warning system*** (FFEWS) being developed by GIZ and has been trained in the use of the system. Further training in the use of the hydrological, hydraulic and flood forecasting and early warning modelling and decision support systems as well as upgrades to computer equipment for running models are needed. During the AF project consultations, the Montenegrin Hydrometeorological Services (IHMS) identified the needs for the development of modelling capacity within the department and for a better cooperation and coordination of HMS activities. Currently coordination among HMSs in the Riparian countries is being undertaken through informal (person to person) contacts, relying on interpersonal relationships as well as new formal bi-lateral arrangements. There are difficulties in coordination due to different statuses of National Hydrometeorological Services (NHMS) in the different Riparian countries. For example, the Albanian NHMS is currently part of a university department with limited resourcing capacity, as well as functional capacity for effective national HMS activities. Development of a coordinating structure for cooperation on flood risk management in the Drin Basin will be important. There is a need for smooth data exchange and prioritized cooperation on data sharing. Dams management in Albania also needs to be addressed as operation of dams in Albania posed potential risks to flooding in Montenegro.

67. Local preparedness plans for communes in Shkodra and Lezha in Albania have been developed by GIZ, as well as in Montenegro but the plans need to be updated using the new climate risk information to be developed through the modelling and in case of Albania the new territorial administrative reform has reduced the number of local government units from 375 to 61 affecting the existing plans.

68. The Directorate for Emergency Management (DfEM) within the Ministry of Interior is responsible for ***Disaster Risk Reduction*** and for implementation of the Sendai framework in Montenegro. It has elaborated the DRR strategy for Montenegro in line with Sendai Framework. DfEM prepared the plan for protection and rescue for floods. An important requirement for implementation of the plans is risk assessment which is currently missing as there is no hazard and risk mapping for any of the hazards in Montenegro. In addition, there is no Loss and Damage database for Montenegro and no harmonized methodology for collecting loss and damage information at the national level. Municipalities have local commissions for damage and loss data collection, but there is no mechanism for providing or using the information centrally. There is no centralized damage and losses database. In accordance with Sendai, Montenegro needs a standardized damages and losses assessment methodology at local and central levels and a centralized disaster database. 112 Centre is established in Montenegro with the Operation Centre (OC) housed in the Directorate for Emergency Management. At the local level, there is no EWS established for any hazards and no equipment such as sirens. GIZ project established local plans and undertook awareness raising campaigns. There is good communication between IHMS and DfEM. Structural and non-structural measures have been identified by DfEM which has established a catalogue of measures.

69. In Montenegro SNC recommendations for addressing climate-induced flood risks include:
    (i) strengthening the hydro-meteorological network;
    (ii) better coordination between the government, the Agency for Nature and Environment Protection and the Institute for Hydrometeorology and Seismology (IHMS) on hydrometric data archiving, establishment of a water information system;
    (iii) enhanced data sharing;
    (iv) harmonization of data set standards;
    (v) clarification of roles, responsibilities and “ownership” of hydrometric data;
    (vi) improvements in flood forecasts;
    (vii) regular maintenance and reconstruction of constructed flood protection structures;
    (viii) mapping and updating a cadaster of hydrogeological phenomena and speleological units;
    (ix) restoring, modernizing and expanding the network of water-measurement stations on karst watercourses;
    (x) mapping surfaces endangered by high waters, analyzing options enabling the IHSM and the relevant municipal services monitoring priority watercourses;
    (xi) defining erosion potential of watercourses.

(xii) implementing regional projects on the regulation of Skadar Lake, Drim and Bojana Rivers and on the establishment of an appropriate operation regime for hydro-power plants on the Drim River and in the Niksic Field in order to prevent frequent flooding in the territories of Montenegro and Albania (Zeta Valley, Skadar Valley, valleys along the Bojana River, etc.)[22]. The proposed project would also assist the government of Montenegro to implement priorities defined by the Strategy for Disaster Risk Reduction for the period 2018-2023 and its associated Activity Plan including local level resilience building measures.

70. UNDP supported the Directorate for Emergency Management and municipalities in the creation of a GIS based platform for flood hazard mapping for 12 of the flood prone municipalities of Montenegro following the extensive floods in 2010. These maps are based on recorded flooding and not on the flood modelling, so they do not consider floods of various return periods, and do not take climate change into account. However, it is a starting point and a base for further consolidation of data, to the extent it is recorded and available, from past floods.

Former Yugoslav Republic of Macedonia

71. The Macedonian Law on Waters defines waters as a common good (property of the state) and sets water management and protection rights and obligations. The direct obligations for water management, lies with several governmental institutions with the competencies shared among the following six ministries: Ministry of Environment and Physical Planning; Ministry of Agriculture, Forestry and Water Economy; Ministry of Transport and Communications; Ministry of Health; Ministry of Economy; and Ministry of Education and Science. In addition, the Hydrometeorology Directorate and the Public Health Institute, as separate Governmental institutions, are also included.

72. The ***institutional framework for FRM*** in FYR Macedonia suffers from a lack of clearly defined responsibilities, competency and authorization to enforce legislation relevant to flood hazard and risk management, national legislation which is not fully aligned with the EU Acquis (EU WFD, EUFD). In addition, there is limited, fragmented and overlapping technical and financial institutional capacities including limited monitoring, non-reliable, non-harmonized and limited sharing of data among institutions, no basin water cadaster; and flood risk financing and investment is not supported by robust assessment of benefit and costs, no investment plans and no comprehensive financial risk transfer mechanisms for dealing with the losses and damages from flooding.

73. The ***legislative framework for flood management*** in the Republic of Macedonia is comprised of several sector laws focusing on various aspects related to flood management. The system encompasses elements of prevention of damage caused by floods, protection by taking measures to reduce the likelihood of floods, information system about flood risks and in event of a flood, as well as emergency response and mitigation of the impacts on the affected population. The key pieces of legislation are:

(i) the *Law on Waters* which incorporates Flood Risk Management as part of the basin district management principles and includes provisions for the development of a programme of protection';
(ii) *Law on Crisis Management* governs the crisis management system which includes gathering of information, assessment, situation analysis, objectives and tasks determination, development and implementation of the necessary actions for prevention, early warning and handling of crises;
(iii) *The Law on hydro-meteorological activities* which governs the functioning of the National Hydro-meteorological Service in the Republic of Macedonia and responsibilities of the Service and establishes a single meteorological and hydrological observation system and also sets obligations for warning and notice of extreme weather conditions;
(iv) *The law on local self-government which* regulates inter alia the competencies of the municipalities which have responsibility for execution, preparations and undertaking of activities for protection and rescuing of citizens and goods against war destruction, natural and other disasters as well as against the consequences caused by them;
(v) *The law on water management enterprises* which regulates the management, utilization, operation and maintenance of hydro-systems and irrigation and drainage systems;

[22] Projects for this purpose have already been designed to implement emergency measures including the cleaning of the Bojana River bed and the building of an embankment along the watercourse bed, SNC

(vi) *The Law on Spatial and Urban Planning* which regulates the issues on planning of the space, defining the types and contents of various plans.
(vii) *The Law on Protection and Rescue* regulated the responsibilities and organization of the protection and response to disasters in the country, including floods.

74. The ***Hydrometeorological Service*** is a part of the Ministry of Agriculture, Forestry and Water Economy and is responsible for issuing weather forecasts, meteorological, climatological and hydrological data and warnings of extra ordinary weather phenomena in the country. The National Hydrometeorological Service of FYR Macedonia has 3 manual and 6 automatic functioning hydrological monitoring stations (water level) out of a total of 25 stations, and 6 functioning meteorological stations out of 20 in the Crn Drim (Black Drin) sub-basin (See Map 1 in Annex 2). Some of the available time series of daily discharge exhibit considerable gaps. A number of stations stopped operation since about 2003. Besides the HMS, additional stations near dams are operated by dam agencies. In the case of Drini River, hydrological and meteorological data is available with the national power production company, ELEM. Data from manual rain gauge stations are sent to WMO Global Telecommunications System (GTS) every month, while the last 3 hours of data from automatic rain gauge stations are available on the web at any given time. The National HMS is currently way under capacity with only 3 hydrologists/engineers to perform all technical tasks nationally. Current skills are limited in the use of modern modelling methods and tools. There are limited budgets for operations and maintenance of the hydrometric network, which limits the ability to replace spare parts for automatic stations and devices for old (40-50 years old) manual stations for which devices are obsolete. A significant monitoring gap exists at high elevations which precludes the ability to systematically monitor snow fall and melt, which are becoming more variable with climate change, and which are important flood risk variables for the basin. Even without expected climate change impacts, there is a need to rehabilitate and extend the hydrometric observation network, to enable effective monitoring, management, forecasting and early warning of hydro-meteorological events at the appropriate spatial and temporal scale. There is also a need to upgrade the observation network with increased automation. Climate change is increasing the need for a modern, fully functioning, denser network supported by modern technology and skilled practitioners.

75. ***Flood Hazard and Risk Mapping*** is fairly advanced but incomplete in Macedonia. In 2009 UNDP Macedonia developed "Guidelines for Development of Methodologies for Assessment of Risks and Hazards and their Implications" which provides general guidance on approaches to assessing all types of hazards in Macedonia. It does not provide detailed specification for floods and makes no mention of the EU flood directive or its underlying methodologies. National guidelines in line with the EUFD for flood hazard and risk modelling and mapping is needed for harmonized flood risk assessment in all basins. More recently, UNDP Macedonia has undertaken flood hazard and risk modelling and mapping for its major river basins (Strumica and Vardar) and sub-basins (Crna, Polog), but not for the Crn Drim. A baseline assessment of hazard and risk mapping in Macedonia identified the following needs: 1) To support the improvement of a data sharing policy framework among national and international institutions; 2) to promote cooperation among the various institutions involved in risk mapping, also with the scientific support of academic excellence in this field; 3) To support the improvement of standards for geospatial data in compliance with the INSPIRE Directive and for hazard-related standards (e.g. for floods these standards should also be in line with the Water Information System for Europe (WISE) system); 4) To promote the development of hazard-related studies and risk maps in line with EU guidelines and directives; 5) To promote the connection among existing DRR platforms and geoportals and to favor the link with the National Spatial Data Infrastructure NSDI and participation in the IMPLUS project.

76. ***Damage and loss accounting*** for floods is still done manually and records are in paper format and not accessible or useable in detailed damage and loss assessment. The existing disaster loss data system is being expanded to include floods and already contains a large dataset on exposure and vulnerabilities that will enable the assessment and modelling of flood risk, vulnerability and damages in the future. IPA (2017) identified the need to support the upgrade of existing legislation on Disaster Loss Data collection and to harmonize existing methodology; and to support the clarification of roles and responsibilities of different institutions and information flow from local to national level and to identify a coordinating institution that will establish a unique national database accessible to all relevant institutions.

Cooperation over water resources management in the Drin Basin

77. Drin Coordinated Action was established through a Shared Vision for the sustainable management of the Basin and the related MoU (Tirana, 2011) signed by the Ministers of the water and environment of the Drin Riparians: Albania, the Former Yugoslav Republic of Macedonia, Greece, Kosovo and Montenegro. The main objective of the Drin MoU is to promote joint action for the coordinated integrated management of the shared water resources in the basin. The Drin MoU provides the political framework for cooperation among the riparian's and identifies short-, medium- and long-term actions to address problems affecting sustainable development in the DRB. Integrated DRB Management Plan is the long-term objective.

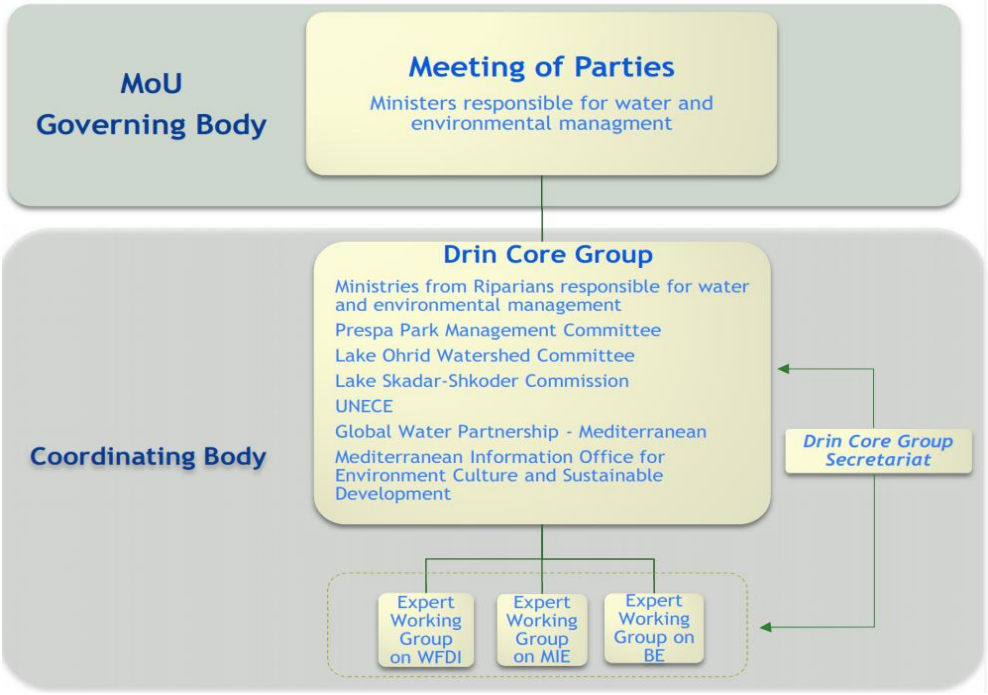


Figure 4: Institutional Framework for the management of the Drin Basin established under the Drin MoU

78. The following institutional set up supports the Drin Coordinated Action (Annex 1, fig. 3): (i) The Meeting of the Parties; (ii) The Drin Core Group (DCG) coordinates implementation of the MoU; (iii) Expert Working Groups (EWGs), an EWG on Floods is being established; (iv) DCG Secretariat hosted by the Global Water Partnership–Mediterranean (GWP-Med). The UNDP/GEF Drin Project[23] executed by GWP-Med assists in building consensus among countries on key transboundary concerns and drivers of change, including climate variability and change, and in reaching an agreement on priority actions.

79. There are also existing bi-lateral agreements between pairs of Riparian countries, such as the newly signed agreement between Montenegro and Albania on water management, including flood management.

Flood forecasting and early warning in the Drin Basin

80. An essential FRM tool is a fully-integrated FFEWS for the basin, which integrates regional, national and community-based systems and provides last-mile flood forecasts, based on EUFD standards and in line with WMO standards.

81. The GIZ-funded project "Climate change adaptation in the Western Balkans"[24] (2012-2018) has been providing advisory services and support to Albania, Kosovo*, the Former Yugoslav Republic of Macedonia

[23] "Enabling transboundary cooperation and integrated water resources management in the extended Drin River Basin" approved by the GEF in 2014. The GEF Drin project includes five components: (1) Consolidating a common knowledge base; (2) Building the foundation for multi-country cooperation; (3) Institutional strengthening for Integrated River Basin Management (IRBM); (4) Demonstration of technologies and practices for IWRM and ecosystem management; (5) Stakeholder Involvement, Gender Mainstreaming and Communication Strategies.

[24] https://giz.de/en/worldwide/29000.html

and Montenegro for enhanced flood and drought risk management in DRB focusing on five key areas: (i) establishing a regional flood EWS; (ii) drafting CC adaptation strategies; (iii) local flood and drought management plans; (iv) transboundary water resource management concepts; (v) integrating CCA into urban planning for Tirana, Podgorica and Belgrade. In Albania and Montenegro FRM plans have been drawn for 31 municipalities and local implementation capacities were enhanced. The rain and stream gauging networks have been extended for flood forecasting with 33 water level and rainfall stations rehabilitated and upgraded. A DRB hydrological model has been developed.

82. The project "South-East European Multi-Hazard Early Warning Advisory System" – USAID/OFDA is aiming to develop a regional multi-hazard early warning advisory system – consisting of information and tools for forecasters at National Meteorological and Hydrological Services (NMHSs) and harmonized national early warning systems. The project is being implemented in the whole of SE Europe including the DRB countries.

83. Hence, through donor and government funded projects there has been gradual modernization of the hydrometric network in the DRB and under an MoU between the national hydrometeorological institutions there is cooperation and data exchange for flood warning. Warnings are currently based on regional forecasts, European Flood Awareness System (EFAS) and Flash Flood Guidance (SEE FFG). GIZ has recently implemented an EWS for the DRB which is now operational in the Riparian countries.

Adaptation alternative – Preferred Solution

84. The AF project will build resilience of communities and livelihoods in the Drin Basin to climate-induced floods by catalyzing a shift to a holistic basin-wide climate-responsive flood risk management and adaptation approaches based on enhanced climate information, risk knowledge, and community structural and non-structural adaptation measures.

85. The proposed integrated approach to climate resilient flood risk management will encompass:

a. increased technical, human and financial capacities of relevant institutions within each Riparian country, with responsibility for flood risk monitoring, forecasting and management to enable implementation of climate resilient Integrated Flood Risk Management (IFRM). This would include strengthening of the hydrometric monitoring network, risk mapping, flood hazard and risk modelling capacity;
b. an enhanced policy and risk financing framework for flood risk management based on enhanced understanding of climate risks;
c. climate-proof and cost-effective investment into flood protection through enhanced capacities to design and implement structural and non-structural flood risk management measures, and to provide effective flood risk reduction measures to the population;
d. enhanced awareness, response and adaptation capacity of the population; engaging private sector into climate information management and risk reduction investment.

Barriers to Basin Level integrated flood risk management:

86. The increasing risk posed by climate change coupled with anthropogenic activities are leading to increased vulnerability of the populations of the Drin River Basin which calls for increased international collaboration in river basin flood management and sound adaptation measures as a focus area of sustainable water management. However, there is a number of barriers to effective basin-level flood risk management which need to be addressed to ensure effective integrated flood risk management for the basin.

1. **Lack of financial, technical and human capacities within the national Hydrometeorological Services, insufficient technologies, equipment, data and tools for flood hazard, risk and vulnerability assessments:**

87. Gaps remain in the hydrometric observation network of all Riparian countries of the Drin, despite several projects and initiatives that have attempted to rehabilitate and upgrade national networks in the past, as well as projects that have taken a basin view of hydrometric needs.

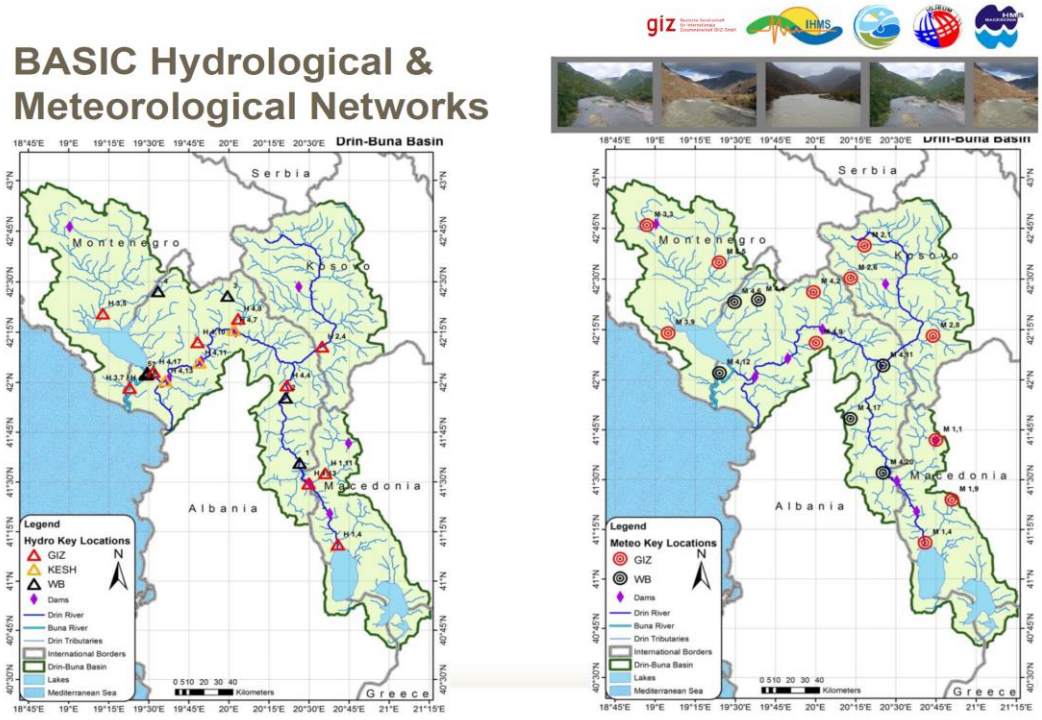


Figure 5: Hydrometric Network of the Drin Basin

88. For example, there are gaps in the hydrometric network at high elevations, which limits the ability to provide sufficient lead times for flood forecasting, and also limits the ability to include snow fall and melt monitoring. It is important to be able to monitor these variables at high elevations, given their increasing variability with climate change. Existing equipment suffers from lack of financing for operations and maintenance, leading to a large number of existing installed stations being non-functional. Financial, human and technical capacities for operations and maintenance differ for each riparian country but remains inadequate, leading to hydrometric stations falling into dis-repair even within a few years of installation. Previous projects which have rehabilitated or installed new equipment have not addressed sustainability of the equipment, nor have riparian governments.

89. Digitization, archiving and systematization of historical data remains *ad hoc* and project-based despite national and basin level attempts to address this issue. Hydrometric networks under private ownership are largely disconnected from the formal centralized hydrometric networks nationally and at basin level due to missing strategies, protocols and mechanisms for data sharing. Human capacities are a major challenge in at least two of the riparian countries. In Albania, the mandate and functional capacity of the NHMS is limited by its status of a severely understaffed and underbudgeted department within a Polytechnic University. It therefore lacks the capacity to execute the necessary functions of an NHMS. In FYR Macedonia, there are only 3 hydrologists in the Hydrometeorological Service for the entire national network and budgets, equipment and technical capacities are limited.

90. These severe gaps in National Hydrometric Service Capacities results in a lack of comprehensive and readily available data for flood hazard risk and vulnerability modelling and mapping, for effective basin-wide flood forecasting and for strategic basin-wide flood risk management initiatives. The newly developed basin FFEWS system is incomplete in terms of the stations for which digitized historical data is provided which limits the underlying model calibration and the accuracy of forecasts that are provided. Missing high elevation stations also do not allow for snowfall and snowmelt to be sufficiently factored into forecasts.

91. There is, as yet, no definitive flood hazard, risk or vulnerability mapping for the Drin basin and the technical and financial capacity to undertake such mapping is lacking. Furthermore, there is a lack of

relevant capacities for risk, damages, losses, exposure and vulnerability assessments. The socio-economic information required to assess climate induced flood damages, losses, exposure and vulnerability is not currently available and is not collected systematically. Existing methodologies and procedures for collection of damages and losses information currently carried out by the municipalities and/or dedicated commissions, varies in approach and quality of data from one municipality to the next and between Riparian countries. This represents a barrier to effective flood hazard and disaster risk management in the basin and needs to be addressed in order to enable risk-informed decision-making on which the socioeconomic future of Riparian countries depend, and to reduce the risk to acceptable levels.

92. Climate-induced flood risk information is not being systematically used to inform national, sectoral and local planning, mainly due to the lack of comprehensive and definitive national hazard and risk mapping. Hence activities within key sectors in Riparian countries such as water management, energy, transport, agriculture, forestry, spatial planning, are not risk-informed and do not take account of climate change. There is limited technical capacity and risk knowledge in flood hazard and risk assessment, due to a lack of standardized hazard, and risk assessment, modelling and mapping methods and technologies for such assessments. To date, only limited, small-scale site-specific modelling and mapping has been undertaken at discrete locations in the basin, which have not taken a river basin perspective, to include the hydrological and hydrological linkage of upstream conditions and processes to downstream, nor have they included climate change. There is therefore no single source of definitive climate-induced hazard mapping of the appropriate technical specification, which includes the whole basin at an appropriate level of detail for all users, to provide the basis for risk-informed decisions and risk-informed activities such as spatial planning, floodplain management policy and emergency response for the basin. Furthermore, there is limited technical capacity and experience of responsible Riparian institutions to produce such. Importantly, previous risk assessments have not explicitly included the dams of the DRB or the effect of their operations on flood risk and water management at the basin scale. There are no platforms for the coordination and dissemination of climate-risk information across all sectors such as a centralized flood risk information system to enable systematic use of climate-risk information in decision making and importantly, in the management and reduction of climate-induced flood risks across all sectors in Riparian countries. At present, strategic planning for flood risk management is not climate-risk informed and do not take a river basin perspective.

2. Limited capacities and insufficient policy framework for basin-level coordination, cooperation and joint basin-level strategic action on flood risk management

93. There is currently limited basin-level coordination and cooperation on flood risk management. Under an MoU between the national hydrometeorological institutions there is cooperation and data exchange for flood warning, based on regional forecasts, European Flood Awareness System (EFAS) and Flash Flood Guidance (SEE FFG).

94. As discussed above, the Drin Coordinated Action was established to promote joint action for the coordinated integrated management of the shared water resources in the basin, based on the political framework for cooperation provided for in the Drin MoU. While the MoU has identified actions to address problems affecting sustainable development in the DRB, it does not currently specifically address joint actions required for cooperation on flood risk management. The Integrated DRB Management Plan which is currently being developed, will also not specifically include a basin flood risk management strategy or plan.

95. As part of the institutional set up which supports the Drin Coordinated Action an expert working group on floods has been recently established, which will support technical consultations related to basin-wide flood risk management. However, institutional capacities at the regional, national and sub-national level across the basin are insufficient to secure climate-resilient FRM.

96. The existing coordination and bilateral agreements are insufficient for a truly transboundary river basin approach to flood risk management. What is missing is a basin-level integrated climate change adaptation and flood risk management strategy and plan and a multi-lateral Framework Agreement for the DRB in the field of flood risk management in which all Riparian countries are Party and which establishes the institutional and legal basis for cooperation, with the international legal capacity, necessary for exercising its functions and clear roles and responsibility for decision-making, cooperation or coordination. Decision

making of this nature requires a legal basis and processes and procedures to enable adoption of recommendations and decisions that are of binding character for all the Parties. Such a framework agreement also needs to provide conditions for effective FRM and conditions for financing basin-level FRM activities.

3. Flood risk reduction, including flood protection measures, do not adequately integrate climate risk information, ecosystem-based and non-structural approaches to climate resilience

97. A significant gap to be addressed for any effective FFEWS is related to the "last mile" communication and delivery of the warnings to the local communities and an enhanced community-based risk reduction. There is currently no comprehensive community-based EWS, where these might be more appropriate than sole reliance on a centralized EWS, this is particularly important where warning times are short. Additionally, the system does not currently include a comprehensive treatment of flash flood forecasting, particularly important for upstream communities. Key sectors at risk from flooding in Riparian countries currently lack the sector resilience and preparedness plans which would enable them to manage hazards and minimize the impacts to people, critical infrastructure, and normal economic activity within the sectors. Seasonal forecasts are not systematically provided to important sectors such as energy, water management, forestry and agriculture. Strategic planning for flood preparedness and response are not climate-risk informed and do not take a river basin perspective. It is understood that these existing limitations in the flood forecasting and early warning system will be addressed in the next phase of the GIZ project which will start in 2019.

98. While the flood forecasting and early warning system provides preparedness for floods, many of the communities of the Drin Basin remain highly exposed to flooding and require preventative and protection measures to further minimize the impacts of flooding. In the Riparian countries of the DRB, flood defense and flood risk management are done in a reactive manner and as budgets allow. Relevant institutions have limited annual budgets to address urgent issues like structural defense needs, and currently do not take a climate risk-informed strategic approach (e.g. river basin approach) to flood risk management interventions. During the Socialist era, flood management relied on flood defense construction almost exclusively, but many defenses have exceeded their design life and have not been upgraded or maintained and are therefore now largely ineffective. In the modern era, flood risk management should be a mixed approach, which combines both structural and non-structural measures. Non-structural measures include, early warning systems, agro-forestry, climate proofing, watershed management etc. There is limited use of modern eco-system-based flood risk management approaches and approaches which combine both structural and non-structural measures as part of FRM, due to a lack of knowledge and application of non-structural measures and ecosystem-based approaches (EbA) to flood risk management. There is also limited knowledge and capacities among local communities on climate resilient livelihoods for coping with climate-induced hazards.

Project / Programme Objectives:

99. The ***objective of the project*** is to assist the riparian countries in the implementation of an integrated climate-resilient river basin flood risk management approach in order to improve their existing capacity to manage flood risk at regional, national and local levels and to enhance resilience of vulnerable communities in the DRB to climate-induced floods. The countries will benefit from a basin-wide transboundary flood risk management (FRM) framework based on: improved climate risk knowledge and information; improved transboundary cooperation arrangements and policy framework for FRM and; concrete FRM interventions.

100. As a result, the Adaptation Fund project will improve the resilience of 1.6 million people living in the DRB (direct and indirect beneficiaries).

101. The project will contribute to the strengthening of the current **flood forecasting and early warning system** by increasing the density of the hydrometric network, and by digitizing historical data for stations not currently in the existing forecasting model. The project will develop and implement ***transboundary integrated FRM strategies*** providing the national authorities with robust and innovative solutions for FRM, DRR and climate adaptation, including ecosystem-based gender sensitive participatory approaches. In addition, the project will develop the underlying ***capacity of national and regional institutions*** to ensure

sustainability and to scale up the results. It will support stakeholders by providing guidance, sharing climate information, knowledge and best practices. The project will also invest in the ***priority structural and community-based non-structural measures***. Importantly, the project is aligned with and will support the implementation of the EU Floods Directive (EUFD) in DRB countries.

102. The AF project will build upon experience of Regional UNDP/GEF Drin project (see baseline initiatives section above) and other projects[25,26] in the region and will include the following ***innovations***: 1) introduction of international best practice in flood hazard and risk assessment, modelling and mapping in line with EUFD; 2) innovative mix of structural and non-structural interventions based on climate risk-informed design; 3) agro-forestry measures and community-based flood resilience schemes. The ***socio-economic benefits*** include reduced damages and losses and improved food production (through protection of agricultural land). This will have direct and indirect livelihood protection and potential income generation benefits. Climate risk informed planning of the hydropower sector is important to enhance hydropower operations to include transboundary climate-induced flood risk management, thus ensuring the continued sustainable development of the hydropower sector which will help continue the shift to clean energy in the region. Climate risk information will also safeguard critical infrastructure assets such as transportation (roads and bridges) which are critical to the economic development and functioning of communities. ***Environmental benefits*** include improved ecosystem functions through better spatial planning and non-structural measures such as agro-forestry, which will provide water retention functions, regulation of hydrological flows (buffer runoff, soil infiltration, groundwater recharge, maintenance of base flows), natural hazard mitigation (e.g. flood prevention, peak flow reduction, soil erosion and landslide control), increased riverbed stabilization resulting in decreased erosion, habitat preservation, and reforestation. This project will directly benefit the most vulnerable parts of the population and will have significant **gender co-benefits** which will be ensured through close collaboration with a gender expert dedicated to ensuring that gender considerations are a key part of any consultation or activity planning process. Flooding and disasters in general, impact women disproportionately and the project will ensure that these differential impacts are taken account in all project interventions.

Project / Programme Components and Financing:

Project/Programme Components	Expected Outcomes	Expected Outputs	Countries	Amount (US$)
1. Component 1 Hazard and Risk Knowledge Management Tools	Improved climate and risk informed decision-making, availability and use of climate risk information	Output 1.1. Strengthened hydrometric monitoring networks in the riparian countries based on a unified optimized basin-scale assessment of monitoring needs	Albania, the former Yugoslav Republic of Macedonia, Montenegro	2,379,244
		Output 1.2. Improved knowledge of CC-induced flood risk and risk knowledge sharing through the introduction of river basin modelling tools and technologies for strategic flood risk assessment based on EUFD and development of basin flood hazard maps		
		Output 1.3. GIS-based vulnerability, loss and damages assessment tools and database established to record, analyse and predict flood events and associated losses		
2. Component 2 Transboundar	Improved institutional arrangements,	Output 2.1. Drin River Basin FRM Policy Framework and improved long-term cooperation on FRM	Albania, the former Yugoslav	1,120,756

[25] AF-funded, UNDP Implemented project, "Developing climate resilient flood and flash flood management practices to protect vulnerable communities of Georgia"
[26] GEF-funded, UNDP Implemented project, "Technology transfer for climate resilient flood management in Vrbas River Basin" in BiH

y institutional, legislative and policy framework for FRM	legislative and policy framework for climate-resilient FRM, and development of CCA and FRM strategy and plans at the basin, sub-basin, national and sub-national levels	Output 2.2. Regional, national and sub-national institutions (including meteorological and hydrological sectors) are trained in climate-resilient FRM, responsibilities clarified and coordination strengthened	Republic of Macedonia, Montenegro	
		Output 2.3. Drin River basin Integrated CCA and FRM Strategy and Plan developed		
3. Component 3 Community-based climate change adaptation and FRM interventions	Strengthened community resilience through improved flood management, through implementation of structural and non-structural measures and enhanced local capacity for CCA and FRM	Output 3.1. Introduction of appraisal-led design for structural and non-structural measures using climate risk information and cost-benefit appraisal methods and application of methods to the detailed design of prioritised structural and non-structural measures for three riparian countries	Albania, the former Yugoslav Republic of Macedonia, Montenegro	5,000,000
		Output 3.2. Construction of structural risk reduction measures in prioritized areas		
		Output 3.3. Strengthened community resilience to flooding through the participatory design and implementation of non-structural community-based resilience, adaptation and awareness measures		
4. Project/Programme Execution cost				650,000
5. Total Project/Programme Cost				9,150,000
6. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)				777,750

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	September 2019
Mid-term Review (if planned)	September 2022
Project/Programme Closing	December 2024
Terminal Evaluation	Sept 2024

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities, how these activities would contribute to climate resilience, and how they would build added value through the regional approach, compared to implementing similar activities in each country individually. For the case of a programme, show how the combination of individual projects would contribute to the overall increase in resilience.

Component 1 – Hazard and risk knowledge management tools
Outcome 1: Improved climate and risk informed decision-making, availability and use of climate risk information

103. Key to the strategic management of climate-induced flood risk is to have appropriate density and frequency of monitoring of important hydrometeorological variables. 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 spatially optimized and centrally managed, and that data is made available to all flood management practitioners. The DRB is characterized 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.

Output 1.1 – Strengthened hydrometric monitoring networks in the riparian countries based on a unified optimized basin-scale assessment of monitoring needs.

104. Based on a review of the status and adequacy of existing monitoring networks in riparian countries, the optimized network required for basin-scale flood risk monitoring and management will be identified, based on which, the project will design, purchase and implement new/rehabilitated monitoring network throughout the basin. The hydrometric network design[27] document will be prepared covering network design, prioritized station list, condition of those stations, equipment options, rehabilitation / new installation plan, institutional assessment, operation and maintenance procedures and preliminary costing for rehabilitation and O&M. As part of the project development and in consultation with the NHMS in each Riparian, the numbers and location of required hydrometric monitoring stations required within the Drin basin has been identified and the indicative list is provided in Annex 12. These will be confirmed and prioritized as part of the hydrometric network optimization exercise during implementation.

105. The project will develop a basin operational plan for the optimized hydrometric network as well as an Institutional capacity development plan for hydrometric network O&M, based on which training of hydrometric specialists with responsibility for operation and maintenance of the hydrometric network in all riparian countries, will be undertaken. The project will establish a unified basin-scale hydrometric database and data sharing protocols across all riparian countries[28]. To ensure sustainability of the rehabilitated hydrometric network, the project will develop financing mechanisms, establishing and safeguarding riparian government long-term commitment of network maintenance, national capacity building for design, installation and maintenance of monitoring networks, linkages to basin and regional monitoring networks, community-managed gauging stations. This will also include the development of innovative financing mechanisms that would seek to engage the private sector (hydropower, tourism, agriculture) for which willingness-to-pay surveys will be conducted during project inception, and local government and beneficiary communities (e.g. through engaging local people to assist in maintenance of stations), where possible, to complement government financing. Willingness to pay surveys will identify key private sector players and conduct market assessment to determine their interest in sector-specific climate risk information products that would enhance their operations and their resilience to floods, determine their interest in paying for tailored products and services that will be used in their operations, their willingness to support or partially support the O&M of hydrometric monitoring and early warning systems, equipment and information products and services for themselves and the communities within which they operate.

Output 1.1 – Indicative Activities

a) Detailed review of the existing coverage, physical condition and data collection procedure including the quality of data. Collect data from the relevant Riparian Institutions to get the current station coverage, equipment installed, data period and data collection procedure.
b) Undertake an assessment of the monitoring network requirements for effective monitoring for strategic flood risk management, flood forecasting and early warning in the future and optimize the stations coverage.
c) Undertake an assessment of the existing telecommunications infrastructure to support the telemetered and automated stations.
d) Digitize all relevant historical paper format data for DRB and systematize and store within the hydrometric database. Establish guidelines, procedures, data sharing protocols and user's manuals for the new hydrometric database.

[27] River water level and flow stations, meteorological station, associated telecommunications equipment.
[28] Note, the GEF project has designed and will implement a basing Information system which should be appropriate for this purpose

e) Assess the institutional arrangements and capacity for the operation and maintenance of the hydrometric network and develop Institutional capacity development plan for hydrometric network O&M detailing manpower and financial requirements, and training needs, for the efficient O&M of all the stations in each Riparian country. Assess existing roles and responsibilities and the capacity of staff responsible for operating and maintaining the hydrometric network. Assess the existing protocols for the collection, transmission, sharing, storage, management and use of the observed data.
f) Establish mechanisms for population and maintenance of centralized basin hydrometric database
g) Prepare an operational plan for the hydrometric network including transmission of data, data management, data analysis and reporting procedures. The maintenance plan will cover manpower, technical capacity, material and finance requirements.
h) Provide detailed specification and design including costs of all equipment and each component of the hydrometric network specified including the detailed design and bid document for the stations for future rehabilitation / new installation.
i) Provide technical and financial assistance to improve hydrometric monitoring network (undertake procurement and installation of equipment).
j) Review existing financing of hydrometric network O&M in each riparian country. Identify resourcing, and training needs as well as institutional arrangements for the management of the proposed new hydrometric network.
k) Develop and implement O&M financing mechanisms for the hydrometric network.

Output 1.2 - Improved knowledge of climate change induced flood risk, and risk knowledge sharing through the introduction of modelling tools and technologies for the strategic flood risk assessment based on EUFD and development of basin flood hazard maps.

106. The project will assess current level of implementation of the EUFD in each riparian country and review data availability for the detailed strategic basin-wide flood hazard and risk modelling and mapping. Under the new GIZ project, it is noted the EUFD detailed flood modelling and mapping is planned for the Lake Shkoder/Skadar and Bojana-Buna area. The AF project will undertake detailed modelling of the rest of the basin upstream of Lake Shkoder/Skadar and Bojana-Buna area and will incorporate the GIZ model into the basin wide model. The project will commission/purchase essential datasets and surveys to enable flood risk mapping of the basin upstream of the Lake Shkoder/Skadar and Bojana-Buna area including detailed topographic surveys of the river channel through high risk areas upstream of Lake Shkoder/Skadar and Bojana-Buna area, including major infrastructure across the river (e.g. bridges, dams etc.) and along river banks (e.g. flood walls, levees etc.). A unified basin approach to flood hazard modelling based on EUFD will be established by the Riparian countries under the GIZ project and implemented across all modelling projects in the basin. Using the agreed unified flood hazard modelling techniques, the AF project will establish and/or amend existing numerical hydrological and hydraulic models of the basin based on detailed surveys of the physical characteristics of the river basin and produce high resolution flood hazard inundation maps in line with the EUFD, suitable for use in land use planning, development zoning, flood risk mitigation design, establishment of flood insurance criteria, raising public awareness, and emergency planning[29]. These definitive basin hazard maps will be produced for a number of different return periods and for a range of climate change scenarios and will be the basis of climate risk information for use on climate risk management of the basin. Climate information sharing platforms, protocols and dissemination mechanisms will be strengthened across member countries.

Output 1.2 – Indicative Activities:
a) Establish Spatial Data Initiative[30] and data management system for project
b) Undertake detailed topographic surveys of the river channel through high risk areas including all major infrastructure across the river (e.g. bridges, dams etc.) and along river banks (e.g. flood walls, levees etc.) for the Crn Drim in Macedonia.

[29] See Annex 3 for Outline of the key elements of the modelling approach which the project would look at agree with GIZ project and Riparian countries
[30] A data repository which will provide a structured environment to enforce data integrity and support data auditing, versioning and data quality. Audit trails, as well as structured and categorized schemas, will make data collation, manipulation and analysis more manageable throughout the project

c) Acquire/purchase/commission high resolution topographic data for the floodplain areas through high risk areas of the Crn Drim in Macedonia. Aerial photographs or LiDAR sources would be recommended in order to obtain a high-resolution DEM covering the whole basin. Coarser DEM and topographic data will be used for the rest of the basin for basin wide modelling
d) Using the most appropriate modelling techniques, establish numerical high-level basin wider hydrological and hydraulic models of the DRB. Undertake detailed hydrological and hydraulic modelling for the Crn Drim in Macedonia in line with EUFD and produce high resolution flood hazard inundation maps suitable for use in land use planning, development zoning, flood risk mitigation design, establishment of flood insurance criteria, raising public awareness, and emergency planning for the Crn Drim in Macedonia. Maps will be produced for a number of different return periods and for a range of climate change scenarios. Flood modelling and mapping will cover all relevant flooding mechanisms within the basin.
e) Integrate detailed hydrological and hydraulic modelling for other Areas for further assessment (AFAs) being modelled by GIZ and riparian governments into the high-level river basin model, as and when they become available
f) Undertake capacity assessment of relevant institutions for flood risk assessment and modelling and develop a long-term capacity development plan and training needs.

Output 1.3 - GIS-based vulnerability, loss and damages assessment tool and database established to record, analyze, predict and assess flood events and associated losses

107. The project will fully map the socio-economic conditions within the basin, including locations of marginalized communities (Roma community) and those populations most vulnerable to flood impacts, which will contribute to a body of data on which vulnerability and risk assessment will be based. Methods, tools and protocols will be established and implemented for the strategic collection of socio-economic data, for the systematic long-term updating of socio-economic flood receptor information (property, land use, economic data, socio-economics information etc.) and community-based risk mapping for the basin. The project will develop and implement a GIS-based basin-wide socio-economic risk model which integrates various spatial socio-economic data with the flood hazard maps, performs vulnerability assessment, and produces high-resolution vulnerability maps for the whole basin which will include damages losses, and loss of life estimates for floods of different return period. The model will enable damage and loss modelling, impact-based flood forecasting, cost-benefit analysis and the appraisal of FRM interventions based on cost-benefit analysis, and development of financing mechanisms for long-term FRM. Using the GIS-based risk model, the project will complete a cost-benefit options analysis for the Drin basin, to identify options that maximize benefits.

108. To complement the GIS-based risk model 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. The project will establish a basin-wide damage and loss database for recording historical flood damage information (systematic collection of flood depth, damage and loss data, collection, storage and systematization of historical flood reports across all riparian countries). DisInventar database is currently implemented in Albania, and Kosovo. The project intends to implement the same in FYR Macedonia and Montenegro, both of which have expressed an interest in having this as the standard centralized D&L data base.

Output 1.3. Indicative Activities

a) Develop and codify methods and tools for undertaking socio-economic surveys to collect necessary information to fully map the socio-economic conditions of within the basin.
b) Undertake socio-economic and vulnerability assessment to fully map existing vulnerability within the DRB, in order to identify the most appropriate adaptation options to reduce vulnerability within the s basin.
c) Develop a GIS-based flood risk model which integrates various spatial socio-economic data with the flood hazard maps, calculates flood risk, performs vulnerability assessment, produce vulnerability maps which will include damages and loss of life estimates and to test flood management options.

d) Implement the DisInventar database in Riparian countries for the systematic recording of damage and loss.
e) Develop harmonized methods, guidelines and procedures in line with Sendai Framework, 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.
f) Undertake cost-benefit options analysis using the vulnerability loss and damages model to identify options that maximize benefits as the basis for the development of the Integrated FRM strategy and plan for the basin

Component 2 – Transboundary FRM institutional, legislative and policy framework
Outcome 2: Improved institutional arrangements, legislative and policy framework for FRM, and development of climate change adaptation and flood risk management strategy and plans at the basin, sub-basin, national and sub-national levels

109. Institutional and legal framework for flood risk management in the Riparian countries of the DRB are highly fragmented in terms of competencies and suffer from overlapping/conflicting responsibilities of institutions. Mandates need to be clarified at national and sub-national levels, with clear assignment of responsibilities among institutions. The AF project will consolidate and extend current flood risk management efforts by DRB countries through the establishment of a dedicated coordination mechanism on flood risk management with the necessary political support and resourcing from the Riparian countries to comprehensively address missing formalized and effective cooperation on FRM.

110. The project will engage the hydropower and other relevant sectors in flood risk management of the DRB, in order to account for strategic water releases as well as issues of sufficient hydrological flows to wetlands to maintain ecosystem function. The project will also develop policies for basin-wide climate responsive flood risk management, which also integrate environmental and socio-economic requirements (harmonized with protected area management plans and the requirements of marginalized groups and vulnerable farmers).

Output 2.1 – Drin River Basin FRM Policy Framework and improved long-term cooperation on flood risk management
111. The Drin Core Group will be given responsibility for the coordination of the flood management at the Drin Basin level as part of its overall mandate to coordinate the Riparians for the management of the Basin along with the other bilateral cooperation arrangements. In this regard, the project will support the operation of the DCG Expert Working on Floods (Drin EWG Floods) during project implementation and will help identify and establish the long-term financing mechanism of the working group as part of the Drin Core Group operation. The Drin Core Group will be the Steering Committee of the project activities of regional nature and will assist in the coordination among countries for the activities of transboundary importance to be implemented at national level. The Drin Core Group with the assistance of the Drin EWG Floods will coordinate the implementation of joint periodic surveys, conferences, workshops, co-working activities.

112. The project will review existing FM policy and enabling environments in each riparian country and develop basin FRM policies for the implementation of FRM legislative and policy framework in line with relevant EU directives. A key policy to be implemented will be basin wide floodplain zoning/development policy based on detailed hazard and risk maps. In addition, the project will explore and recommend a basin-wide policy for risk financing and transfer mechanisms. The project will establish harmonized basin wide sector FRM policies for priority sectors (e.g., agriculture, energy, forest, water management, natural resource use, catchment management).

Output 2.1 Indicative Activities
a) Review existing FM policy and enabling environments in each riparian country and develop basin FRM policies for the implementation of FRM legislative and policy framework in line with relevant EU directives.
b) Development of risk financing and risk transfer mechanisms strategy to include private sector engagement strategy for long-term implementation of risk financing and risk transfer mechanisms

for national-level flood risk financing and resilience strategy. Also, to include identification or public-sector risk financing mechanisms for flood risk management. Risk financing and transfer mechanisms products and tools will be identified (if existing) and/or developed based on detailed socio-economic risk, damages and losses assessment (to be undertaken in Output 1.3). The project will undertake feasibility studies for the identified and shortlisted risk financing mechanisms.

c) Sector FRM policies (at least 2 – energy, agriculture) - Undertake detailed technical studies (including modelling) on climate change impacts on the identified sectors (energy and agriculture) in the DRB. Consult with national sector leaders and relevant stakeholders on findings of study and invite comments on recommendations through the floods working group. Develop and codify detailed methodologies for incorporating climate-change responsive flood risk considerations into risk assessments, strategies, policies and plans for the energy and agriculture sectors. Develop and finalize robust sector FRM policies and any necessary enabling guidelines and/or tools for effective implementation of new policies.

Output 2.2 – Regional, national and sub-national institutions (including meteorological and hydrological sectors) are trained in flood risk management, roles and responsibilities clarified and coordination mechanisms strengthened for effective climate-resilient FRM

113. The project will develop a DRB Stakeholders Analysis and the Governance Analysis focusing on Flood management based on the Stakeholders Analysis and the Governance Analysis done as part of the GEF Drin Project. This will include the following: (i) define all institutions at basin, national, sub-national level involved in water and flood risk management or institutions with activities that impact on flood risk (e.g. forestry, mining, town and country planning, mining, dam owners, and community organizations), including the role of NGOs/CBOs, donors, private sector, women's organizations; (ii) conduct functional analysis of the institutions; (iii) analyze existing resources (staffing and budgetary) including sufficiency of staffing levels, existing capacity and tools; (iv) analyze existing policies, procedures and protocols, national guidance documents or codes of practice; (v) analyze interaction between institutions (e.g. information sharing, cooperation on functional activities, reporting between institutions); (vi) assess access to data and risk knowledge sharing among decision makers, practitioners, government, private sector and civil society, (vii) assess coordination mechanisms and implementation arrangements organized at basin, national and sub-national levels.

114. Based on the analysis, the effectiveness of institutional arrangements in individual riparian countries towards basin-scale flood risk management will be analyzed and if necessary, the ToR of the Drin EWG Floods will be revisited in terms of mandate, membership, resource requirements, technical capacity and technical enabling environment; data sharing and data access and technical means and tools for coordination. In consultation with riparian countries and the DCG a strategy and a five-year work program of the Drin EWG Floods will be developed and implemented. It will describe above all: DRB institutional capacity development plan including, plans for individual riparian countries, the resources, tools, technology, technical guidelines, procedures, protocols and codes of practice for comprehensive basin-scale FRM, the role of the DCG and the EWG in the preparation and implementation of the Drin River Basin Integrated CCA and FRM Strategy.

Output 2.2 - Indicative Activities

a) Institutional mapping to identify the current relevant national and sub-national government departments with functions in flood risk management in each Riparian country.
b) Institutional capacity assessment and gap analysis to include functional, resourcing, technical and financial capacity assessment. Development of long-term Institutional capacity development plan addressing resourcing, technical, and financial needs in each Riparian. Develop training programme for climate risk management and flood risk management and embed in relevant national/regional institutions to improve the technical capacity and knowledge base for climate risk management and a long-term adaptation planning for flood risk management.
c) The ToR of the Drin EWG Floods will be revisited in terms of mandate, membership, resource requirements, technical capacity and technical enabling environment; data sharing and data access and technical means and tools for coordination. In consultation with riparian countries and the DCG a strategy and a five-year work program of the Drin EWG Floods will be developed and implemented.

d) Deliver prioritized training to practitioners, decision-makers and communities to include the following:

i. Flood hazard and risk modelling and mapping methods (hydrological and hydraulic modelling). During the basin flood model development, training will be provided (to custodians, users and managers of the flood model and who will undertake the modelling in each Riparian country) in all aspects of flood risk modelling.

ii. Hydrometric network design and O&M to include the planning, design, establishment and upgrade of monitoring stations to meet a range of needs, optimisation of the hydrometric and integration of monitoring networks of different agencies (such as HPP networks) where possible to ensure network complementarity and that regular data exchange; training of sub-national staff in equipment maintenance.

iii. Flood risk assessment: Training in conducting post-event flood damages and losses assessment and Post-Disaster-Needs-Assessment (PDNA) surveys based on the harmonised PDNA methodology to be developed in Output 1.3.

iv. Training of communities (in a gender-responsive manner) in FRM adaptation methods based on the community-based adaptation interventions identified in the basin and sub-basin FRM strategy and national plans

v. Training of practitioners and communities in the development of inclusive community-based early warning systems to enable the communities and practitioners to jointly develop early warning systems, elaborating the components of a system, how they can be set up, options for response to an early warning, and ways to disseminate information to underserved populations (marginalized groups, elderly, disabled) etc.

vi. Design of climate-resilient structural and non-structural flood protection measures.

e) The project's Knowledge Management strategy will be embedded under this Output (along with Output 3.3) and the KM tools and strategies will be developed and applied to fully embed capacity development in key institutions.

Output 2.3 – Drin River Basin Integrated CCA and FRM Strategy and Plan Developed

115. The Drin River basin FRM strategy (FRMS) and plan (FRMP) will be developed for the long-term management of flood risk in the basin. The strategy will outline the high-level basin wide policies for the long-term climate resilient management of flood risk and will be based on detailed strategic climate and flood risk assessment. FRMP will outline the detailed actions that will be taken to address flood risk at the basin scale and within each riparian country, which will be detailed in national FRMPs. It will include a combination of structural and non-structural approaches which will best address flood risk at the basin scale and will involve developing an inclusive list of potential options for alleviating flood risk. The project will seek opportunities to attain the right balance between structural (or hard-engineering) and non-structural (or soft-engineering) flood risk management options.

Output 2.3 – Indicative Activities

1) Development of an integrated basin flood risk management plan for the DRB with participation of all relevant stakeholders. The plan will take a bottom-up, multi-stakeholder, consensus-based approach. This activity will be mainstreamed into the national on-going work on the development of the river basin management plans through the relevant national authorities. From the basin plan, and sub-national plans will be developed. Development of the basin level plan will follow these steps:

Component 3 – Priority community-based climate change adaptation and FRM interventions

Outcome 3: Strengthened resilience of local communities through improved flood forecasting and early warning, implementation of structural and non-structural measures and the strengthened capacity for CCA and FRM at the local level

Output 3.1 – Introduction of appraisal-led design for structural and non-structural measures using climate risk information and cost-benefit appraisal methods and application of methods to the detailed design of prioritised structural and non-structural measures for three riparian countries

Output 3.1 - Indicative Activities

1) Undertake optioneering for long-term FRM measures for DRB including feasibility, outline design and indicative costing. As part of the development of the Drin River basin FRM strategy (FRMS) and plan (FRMP) in Output 2.3, a long list of options will be examined and qualitatively assessed in terms of the socio-economic, environmental, engineering and hydrological impacts of the options, and will form the basis of the short-listing process to be carried out in consultation with stakeholders. An initial appraisal of the short-listed options will be carried out to determine technical performance in terms of flood damages reduction in the basin. Changes in flood levels against the baseline scenario will also be investigated and the effects of such changes assessed. The reduction in damages resulting from an option (as compared to the baseline) represents the option benefits. A range of options will be directly compared and ranked in order to identify the most economically advantageous options or the economically preferred option(s) for the basin. The project will undertake feasibility, outline design and indicative costing of structural options for long-term FRM for the basin as key input to the development of the Drin River basin FRM strategy (FRMS) and plan (FRMP) in Output 2.3. The project will assess the requirement for new structural measures such as the provision of flood storage, the provision of new embankments and walls, local land raising to elevate development areas above the extreme flood level, local improvements to channel capacity and stability, flow control structures, increased maintenance and improvements to channels. The activity will meet relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and comply with the Environmental and Social Policy of the Adaptation Fund.

2) Undertake detailed design for structural measures to be implemented by the project. The project will undertake detailed design for implementation of structural options identified as priority measures during project development. The measures to be implemented are described under Output 3.2 and described in more detail in Annex 5. The approach for detailed design will be as follows:

(i) **Field Surveys**

a. *Inspection of works location and stakeholder consultation*. Inspection will allow the arrangement of existing features to be confirmed, and a high-level assessment of the condition of any existing structures to be made. The inspection will be documented using photographs and standardized record sheets, which will be held for use during the remainder of the project.

b. *Topographic Survey*. Following the initial site inspections and review of available data the design team will scope, specify, supervise and review the survey. Standardized survey specifications and requirements will be used. Typical topographic surveys are likely to include: (i) establishment of a control network, including permanent ground markers, referenced to the same datum as the DEM data and suitable for use during construction/implementation of the infrastructure units; (ii) recording position and level of all features of significance; (iii) recording ground levels between features at an appropriate grid spacing.\; (iv) recording river/stream channel cross sections above and below water level at specified intervals.

c. *Ground Investigation*. The scope, specification, supervision and requirements for geotechnical investigations will be defined to provide engineering properties of native ground and any existing earth structures and the necessary surveys undertaken. Where appropriate to the works required, ground investigations will comprise boreholes or, where appropriate, trial pits. Samples will be collected for laboratory testing and Standard Penetration Tests carried out to allow soil properties to be estimated. Where appropriate

to the works required, sediment samples may also be collected from nearby river beds, channel bars, and banks, and analyzed for particle size distribution in order to assist with the design of any dredging and scour protection works. Where sources of borrow material can be identified samples of possible fill material will be collected for laboratory testing to determine the soils' suitability for use in earthworks. Results of field observations and geotechnical testing will be used to determine the typical geotechnical properties for use in design.

(ii) **Detailed Design:** Detailed designs will incorporate ancillary features to ensure the sustainable operation of the works. The use of appropriate vegetative surface and scour protection (indigenous grasses etc.) to control erosion of earthworks and minimize future maintenance requirements will be specified. All designs will be prepared to appropriate national and international standards and guidance and based on the use of locally available materials. The designs will take into account the long-term objective of operation and maintenance by the municipality and local community. Durability and robustness together with ease of operation and maintenance using the local community will be emphasized.

(iii) Development of procurement strategy and plan: the proposed programme of works identified at proposal phase will be reviewed and recommendations made on an appropriate procurement strategy, including consideration of packaging of works to provide economies of scale in implementation.

(iv) Preparation of Tender Documents: where necessary tender packs will be prepared using Standard Bidding Documents approved by the UNDP. The project will also develop and embed a suitable standard technical specification which will become the standard bidding documents. Other elements of the bidding documents, including bills of quantities, will be standardized across packages as far as possible.

(v) Contract supervision: Typical construction contracts (e.g. under FIDIC conditions) require an organisation to take role of the Engineer, and a Resident Engineer. It is assumed that such roles will be undertaken by personnel from the competent government departments who will provide fulltime engineers for construction supervision to supervise the implementation of the works. UNDP will provide the Chief Resident Engineer (CRE) who will be centrally-based and will oversee the administration of the full programme of works throughout the implementation of structural measures in all riparian countries. He/she will be supported by a team of Resident Engineers and Clerks of Works from each Riparian. The CRE will review all contractor submissions including method statements, programmes, progress reports, applications for payment and claims. The CRE would check and approve as built records provided by the Contractors and prepare Operation and Maintenance manuals for the specific works – generally based on a standardized template. Training in the operation and maintenance of the works will be provided to municipality and local communities who will be involved in the operation and maintenance in the future.

Output 3.2 – Construction of structural risk reduction measures in prioritized areas.

116. During proposal development Riparian countries provided structural measures that have already been prioritised for implementation. The AF project will undertake the detailed design of these structures during project implementation (Output 3.1), and take account of the full river basin impact of the intervention measures. It will undertake detailed climate-risk based assessment (using models and methods developed in output 1 of the project) to appraise all options and develop the detailed design of the proposed interventions. The outline descriptions of the proposed structural interventions are provided below (and detailed in Annex 5).

Structural Measures to be implemented

The Former Yugoslav Republic of Macedonia - Sateska River and Crn Drim River

117. Sateska River is located in the south-west of the Republic of Macedonia. Currently a tributary of Lake Ohrid, it originally flowed directly into the River Black Drim but was re-routed in 1961/2. It now accounts for 39.36% of the Lake Ohrid watershed and is consequently one of its most important tributaries. The 1961/2 Sateska river redirection from its natural flow in the River Crn Drim to the Lake Ohrid, is between the towns of Struga and Ohrid and was motivated by three main reasons:

- To decrease the sediment load on the artificial reservoir Globocica and the hydropower plant Globocica;
- To ensure the hydro potential of the hydropower plants on the River Crn Drim;
- To drain the Struga wetland/marshland.

118. The diversion of Sateska River caused a huge sediment load of approx. 120, 000m^3 annually to Lake Ohrid which is negatively affecting the habitats and the entire ecosystem in the littoral part of the Ohrid Lake. Moreover, Sateska River brings 39% of phosphorus load to the Lake Ohrid which on a long run will increase the eutrophication of the Lake. The sediment that Sateska is bringing is significantly increasing the river bed level and decreasing the storage and conveyance capacity of the river especially during extreme weather events and/or intensive rainfalls.

119. The Black Drim (Crni Drim) River Basin is identified as one of the flood-prone regions in the country. Major identified past floods are the ones in 1962, 1975, 1995 and the most recent one in 2010 and 2015. There are number of different sources of flooding in the Crni Drim Basin, including:

- Fluvial flooding from major rivers when run-off from the surrounding area exceeds the flow capacity of the rivers, streams or the artificial drainage system (Crni Drim, Sateska River)
- Torrential foods: combination of high water discharge and mass movement through the channels of the streams, leading to the transport of large volumes of sediment and debris (Sushicka, Kalishka, Shum, Dzepinka and other torrential rivers).
- Coastal Flooding, in coastal areas of the towns Ohrid and Struga, which is happening during extreme weather events and high tides that are causing a rise in lake levels and coastal flooding.
- Groundwater floods especially in the region of Struga (Struga is built on a former wetland/marshland and has high level of underground waters)
- Flooding in urban areas (due to intensive rainfalls)

120. In 2018, UNDP commissioned a preliminary flood risk assessment for Sateska river and Crn Drim River from the outlet of the Ohrid Lake to Gobocia artificial accumulation, using a model that was used for preliminary flood risk assessment in almost all other river basins and sub-basins in the country and calibrated for the local conditions. It identifies the areas that are prone to flooding, critical infrastructure exposed to floods, the areas of agricultural and arable land, population that will be exposed to floods (maps are provided in Annex 5). The study showed that floods with medium probability of occurrence in this region can cause damage in the range of over 35 million euros.

- Area affected: 3,550 ha
- Potentially indirectly affected population: 70,000
- Potentially directly affected population: 6,500
- Houses: 2,500
- Road network: more than 40 km
- Hotspots: Landfill site in Stuga, and in perspective, the regional landfill in the Municipality of Debarca
- Other objects at risk: possible flooding of central Waste Water Treatment Plant in Vranishta that treats the wastewater from the municipality of Struga and Ohrid, possible flooding of Ohrid international airport, flooding of schools, churches, monuments
- Industrial objects: 40

121. During the 1960s and 1970s several infrastructure facilities were built to reduce the risk of flooding. To protect against fluvial (surface water) flooding, part of the riverbeds of Sateska and Black Drim Rivers have been regulated in the length of approximately 18 km. To protect the town of Struga from flooding especially from the ground water, drainage channel network with a length of over 37 km was built. Also, to reduce the erosion processes of the critical torrential watercourses in the Sateska River Basin, several small check dams and water reservoirs were built.

122. In the period September – November 2018, UNDP commissioned a geodetic survey of the old riverbed of Sateska, and the River Crn Drim from the outlet of Lake Ohrid to Globocica artificial reservoir which determined the most critical sections of both rivers that can cause flooding because of insufficient

discharge capacity, as well as poor maintenance of regulated watercourses and natural river streams, modifications in the entire river basin, and recommendations for actions and measure. Taking into consideration the problem caused by the sediment that Sateska is bringing to the river Crni Drim, the Government financed the preparation of technical documentation/construction design and Bill of Quantities for the regulation of the old and current riverbed of Sateska, as well as afforestation/reforestation study. However, due to the high estimated costs, the project has not been implemented yet.

Proposed solution:

123. Based on the modelling work, field visits, semi-structured interviews, report from previous flood events, previous project documentation and geodesy surveying, the following solutions are proposed to be implemented under the AF project.

Structural measures	
Measure	**Result/Use**
Construction of natural based sediment retention structures at fan apex or on fan (on 2 locations)	Reducing future potential damages caused by sediment transport and disposal
Improvement of hydraulic capacity of Crni Drim River with in urban zone	Effective control of water levels in Ohrid lake and protection from coastal flooding
Reconstruction and increasing the capacity of banks on Crni Drim in rural part in total length of up to 10 km	Increasing the flow capacity, Reducing future potential damages caused by flooding
Improvement of existing drainage system in Struga municipality for underground flood protection	Control on the level of groundwater
Reconstruction of existing diversion structure on Sateska River near Volino	Sediment control and reduction of maximal discharges
Artificial shaping of Sateska river natural bed on critical parts	Reducing future potential damages caused by flooding
Non-structural measures, at watershed level	
Data and Modelling[31]	
Conducting high resolution LIDAR (light detection and ranging) mapping/surveys along the riverbeds with a buffer zone and merge the LIDAR results with the existing DTM models	Modelling of floods (open terrain), flows, landslides or rock fall
Develop flood hazard and flood risk maps (modeling)	priority setting of flood reduction measures (planning and design)
Development of reservoir management models based on daily measurement	Optimal management of the reservoirs based on economic principles, introducing flood control volume in to the existing reservoirs
Improvement of the existing hydro-meteorological monitoring system and weather forecast system	Effective real-time weather forecast

[31] Costs for Data and Modelling come under Output 1.2, but are included here for completion

Afforestation and management of bare lands (sparsely vegetated) affected with high erosion in the Sateska River Basin in total area of up to 100 hectares	Reducing the force of the high wave with water retention on a basin level

124. The proposed solution will benefit over 70,000 people from Municipalities of Struga and Debrca.

Montenegro - Establishment of full-scale embankment system on Bojana River in Montenegro Municipality: Ulcinj

125. According to the 2011 census, total of 20,265 inhabitants live in the Ulcinj Municipality, in 39 settlements, 3.21% of the population of Montenegro. In Ulcinj Municipality, Montenegro, large areas of land and private buildings along the Bojana River are at risk from floods. Floods along the Bojana River primarily threaten the settlements of Sukobin, Lisna-Bori and Fraskanjel, and to a lesser extent the settlements of Sveti Djordje, Rec, Donji Stoj and Gornji Stoj.

126. Several embankments were built in the threatened area, and the longest are Sutjel-Sveti Djordje (1,455 m) and Sveti Nikola-Rec (6,377 m). However, the condition of existing embankments is unsatisfactory because of insufficient and inadequate prevention and no safe protection is provided in the event of major floods. In the Sukobin, Lisna- Bori and Fraskanjel area extending along the Bojana River, between the boundary to Bar Municipality and Briska gora, there are 7 families in Sukobin, 17 families in Lisna-Bori and 5 families in Fraskanjel who are directly threatened. During heavy rainfall, the flooded area merges with Sasko Lake, flooding vast agricultural areas in these villages (Sasko Lake 315 ha, the fields of Fraskanjel and Klezansko covering 500 ha). In Gornji Stoj area along the embankment Sveti Nikola-Rec, seven private buildings are regularly flooded. In the event of a breach of the protective embankments, the number of flooded buildings and agricultural areas would be very high. These include thousands of private houses in the settlements of Gornji Stoj and Donji Stoj (5.237 households) and further towards Ulcinj. The salt works "Bajo Sekulic" covering 14.5 km² are also at risk. These settlements are very densely populated, which is why the potential damages are high, as shown in the table below:

Table 2: Overview of the number of inhabitants, households and residential buildings in the settlements threatened

No.	Settlement	Number of Inhabitants	Number of Households	Residential Buildings
1.	Lisna Bore	175	41	45
2.	Fraskanjel	57	12	18
3.	Sveti Djordje	69	14	24
4.	Rec	63	23	24
5.	Donji Stoj	1,176	434	4.690
6.	Gornji Stoj	111	24	547

127. At the mouth of the Bojana river, there is a large complex of 390 structures (fishing houses, weekend houses and restaurants), as well as the famous Ada tourist center (440ha), with a significant number of bungalows and associated facilities. During major floods, these settlements are flooded and there is water penetration in almost all structures along the Bojana riverbank. In addition, approximately 2,400 hectares of fertile land, representing a significant percentage of total agricultural land in the coastal zone of Montenegro is at risk from the Bojana. The entire area along the Bojana River is endangered by the flood waters of the Bojana River itself and the mountainous watercourses.

128. In November and December 2010, record-breaking precipitation resulted in record water levels in Lake Skadar and record water levels in the Bojana River and other river flows. In the Lake Skadar water level reached a record high of 10.44 asl. The most severe damages were suffered by flooded residential houses in the settlements of Lisna Bori, Sukobin, Fraskanjel and Sas, downstream cottages and catering facilities to the river delta and buildings of the company “Ulcinjska rivijera” at Ada Bojana. In total, approximately 7.4% of Ulcinj Municipality's territory was flooded, where agricultural land, agricultural equipment, plantations (greenhouses) and tangerine plantations were most affected.

129. The embankments of Sveti Djordje-Sutjel and Rec-Sveti Nikola were important defensive infrastructural facilities that were partially damaged, and then suffered even more damage during the January floods. There was an immediate intervention on those embankments using construction machines at the most critical points and works on the embankment of Sveti Djordje. However, after the January floods in 2010, 900 m remained unfinished so that, in early November-December floods, despite an urgent intervention to the most vulnerable parts of the embankment, when the Bojana River water level reached its maximum, on 4 December 2010, the Rec-Sveti Nikola embankment, partly used as a paved road to the village of Rec, was flooded. The water level was approximately 40 cm above the road.

Proposed solution:

130. The project will implement upgrading and reinforcement of the protective embankment along the Bojana River and develop a long-term maintenance plan for the protective embankment.

131. It should be noted that there is no up-to-date hydrological or hydraulic assessments of the Bojana River or Lake Skhoder/Skadar, that would permit detailed design of the proposed intervention. Past remedial works also haven't taken climate change into consideration and have largely repaired the embankment to original condition as necessary. Hence, AF project will undertake detailed design and implementation of climate resilient rehabilitation of the Bojana embankment. It will utilize detailed modelling to be produced by GIZ which will include up-to-date hydrology and hydraulic modelling and climate change and would enable options modelling in the identification and development of the most appropriate design.

132. The following activities will be carried out by the AF project:

- Detail technical documentation for full scale embankment system on Bojana River in Montenegro, including all necessary assessments, field examinations and mapping (Output 3.1);
- Detail Bill of Quantities for rehabilitation and construction of embankments; (Output 3.2)
- Construction and restoration of priority embankments (Output 3.2);
- Creating a database for all facilities and populations in the affected area (Output 1.3).

133. Structural measures in Ulcinj municipality will benefit 20,000 people (population of the municipality), including 2,000 people living in six most vulnerable villages. In addition these measures will protect approximately 30,000 tourists visiting the Ulcinj municipality every year during summer season (source FRM Plan for Ulcinj Municipality, 2013).

Albania - Construction/reconstruction of flood protection infrastructure in the downstream of Drini, Buna

Area at risk - the Lower Drini-Buna River Basin in North-West Albania

134. The land of the Lower Drini–Buna River basin is at a very high risk of flooding. This is a result of geological changes some 150 years ago which diverted the flow of the Drini to join the Buna at Bahcallek. The capacity of the Buna River, particularly the reach from the Drini-Buna confluence to Shirqi Village, is insufficient to prevent frequent overtopping of the river banks and consequent flooding. The most recent major flood events occurred in January 2010 and again in December 2010 causing major hardship to the local population. The flooding of January 2010 in the district of Shkodra was at the time considered the biggest emergency event to have arisen in the area: 14,100 ha were flooded, 4600 houses were inundated, and 12,150 people evacuated. The direct economic loss to Albania has been estimated as ALL 2.5 billion (EUR 18 million) from the December 2010 event alone, rising to ALL 4.4 billion (EUR 37 million) when indirect losses are accounted for. A World Bank study shows that out-of-bank flow occurs from the Buna on average once every two years, and direct damages caused by flooding rise from ALL 135 million for a 50% likelihood event, up to ALL 5830 million for the 0.1% likelihood event.

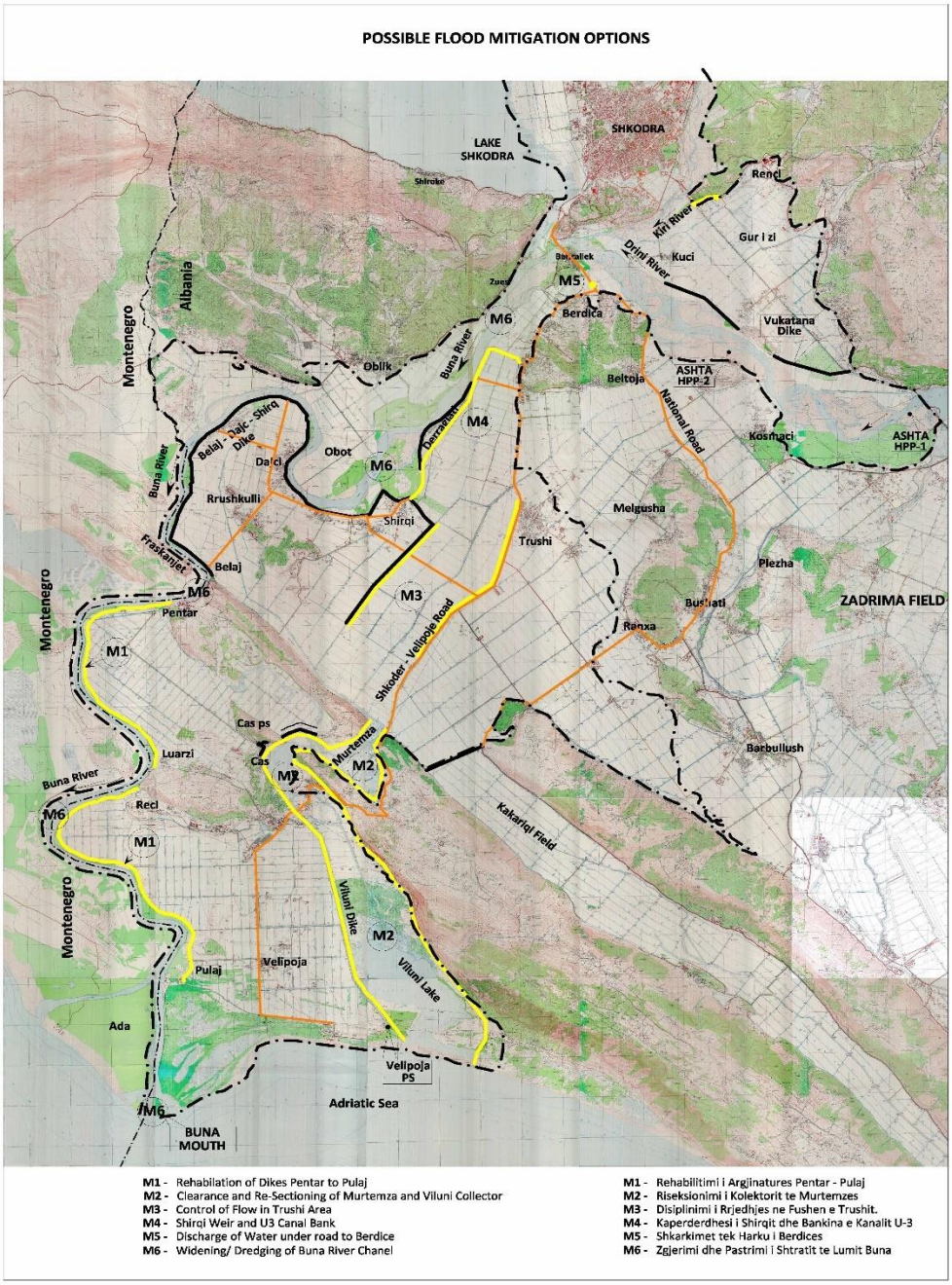
135. From the 1960s a system of flood protection dikes has been developed on the downstream reaches of the Buna River and downstream part of the Drini River between Vau Dejes and Bahcellek, to protect

against flooding over the left bank into developed residential and settled agricultural areas. These dikes have been partially effective in protecting land from flooding, however in the most serious events breaches have occurred in the dikes, particularly in the reach between Shirqi and Belaj. Over the upper reach of the Buna River, from Bahcallek to Shirqi there are no existing flood protection dikes. The reason for this is that it is feared that construction of dikes in this reach would result in increased flood levels in Shkodra Lake, with consequent increase in flood risk to the City of Shkodra and surrounding area.

Proposed solution:

The project will implement rehabilitation/enhancement of dikes/embankments, flow control measures and clearance of vegetation. Three options for structural measures have been shortlisted at the project development phase with the Government of Albania. These options will be further assessed and detailed design will be completed for one of them during the project implementation:

- Improvements to existing river dikes – option Pentari to Pulaj. If implemented this measure will benefit villagers, their homes, livestock, agricultural land and other assets in the villages of Luarzi, Reci, Reci i ri, Pentari, Velipoja and Pulaj, as flooding will be reduced in extent, depth and duration
- Clearance of vegetation and widening of drainage channels Murtemza-Viluni. Access for clearance of vegetation and excavation will be limited by weather conditions and any overland flooding.
- Reinforcement of Canal Embankment and Renewal of Shirqi Weir, plus control of overland flow from Shirqi to Murtemza. These components should be undertaken after works at Murtemza and before any dredging to increase the capacity of the Upper Buna.



136. The proposed structural measures will be supported with the non-structural measures (Output 3.3) as follows: (i) protection of river bank areas (planting of hydrophilic vegetation e.g. willows, acacias along the riverside to protect soil from erosion), (ii) prevention of constructions and land use (Buna River in the area of Zue village (1 km); Drin River (3,5 km) in the area of Ganjola-Vukatanë-Kuç; Kir River (1,5 km) Bardhaj-Bleran and in the area of Kuci village); (iii) enforcing planning controls to prevent further development in the flood route through Berdica, and in other 'at-risk' areas such as the low-lying land between the Drini and Buna at their confluence.

Beneficiary communities:

Area	Population	Number of Households	Area (ha)

Shkodra Municipality	114,219	34,898	1646
Vau I Dejes Municipality	12,520	3,385	3060
Ana e Malit	5,859	1,690	4180
Berdicë	9,172	2,556	3102
Guri i Zi	11,619	3,072	8170
Rethina	23,418	5,668	4705
Velipojë	8,718	2,255	7240
Total	185,525	53,524	32103

Output 3.3 - Strengthened local community resilience to flooding through the participatory design and implementation of non-structural community-based resilience, adaptation and awareness measures

137. In order to ensure participatory and long-term sustainable community resilience the project will provide training to selected municipalities/communities on maintenance of non-structural intervention measures. Some non-structural measures have already been identified as part of the structural measures (e.g. for Macedonia), but it is envisaged that, during the development of the basin FRM strategy, additional non-structural measures will be identified. Non-structural options will include a suit of measures for management of hillslope and floodplain vegetation to enable greater rainfall infiltration and transmission and reduce erosion. This may include reforestation (with diverse, native species) and the use of seasonal cropping, agroforestry, the use of vegetative bundles to build flood defenses etc., floodplain agro-forestry systems and bio-engineering measures. Flood risk management measures will promote the re-establishment of natural floodplain functionality including: floodplain reconnection; selective bed raising / riffle creation; wash lands/wetland creation; re-meandering straightened rivers; land and soil management activities to retain/delay surface flows; creation or re-instatement of a ditch network to promote infiltration (swales, interception ditches, etc.); In-channel vegetation management growth to maximize channel roughness. Income generating ecosystem-based adaptation and FRM measures (e.g. agro-forestry) will be implemented in priority areas throughout the basin. These schemes will form part of the non-structural interventions to be implemented and will be subjected to the same assessment and appraisals as structural interventions as described above. National standards for the non-structural measures will be reviewed and the project will aim to harmonize standards for the basin. This will be done through the development of guidance documents associated with each type of intervention.

138. The project will develop local government response capacity, training first and second responders for flood emergencies through drills and role play exercises. Training will be provided for communities on roles and responsibilities during flood emergency procedures. Community-based resilience and adaptation will be built using participatory methods of risk assessment and community resilience planning. Community-based response roles and responsibilities will be defined and training of local communities undertaken. Community-managed flood forums will be established.

139. Training will be undertaken in a gender-sensitive manner on the operation and maintenance of non-structural measures to increase capacity of local communities in the maintenance of non-structural intervention measures, utilizing the project KM tools and strategies. Information dissemination to reach all beneficiaries will be established, awareness raising and education, and gender mainstreaming approaches established.

B. Describe how the project /programme would promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms.

140. To date, flood risk management in the DRB has been dealt with in an *ad hoc* and reactive manner, relying on measures such as hard structural protection measures which are not designed using climate

risk-formed flood hazard information and are therefore not climate proofed; post-disaster emergency response, with limited reliance on forecast of the event or satisfactory prior warning of the population and post event compensation to victims. Furthermore, FRM within the DRB has been largely undertaken unilaterally by each Riparian country without consideration of the wider basin perspective.

141. The AF project being developed will address the barriers to establishing and implementing a fully integrated basin flood risk management approach aimed at supporting the commitment of the Riparian governments to avoid losses of lives and to reduce economic and infrastructure losses caused by climate-induced flooding.

142. With the AF project, there will be strengthened technical, institutional and financial capacities to implement and maintain a fully integrated basin FRM, clear institutional arrangements and responsibilities for key national institutions, comprehensive and definitive flood risk maps and information as well as strengthened legislative and policy framework to address existing weak land use, spatial planning and sectoral flood resilience and risk management, leading to reduced exposure of communities to damages, losses and loss of lives. In addition, institutional and financial capacities and introduction of modern methodologies and technologies will enable the design of climate risk informed flood mitigation measures. The basin-level approach to the identification of flood risk management intervention measures will ensure that the most vulnerable communities at risk from flooding will have the coping capacities and adaptation strategies at community and individual level to adapt to climate change and to manage and minimize their exposure and resilience.

143. Specifically, the project will introduce the following innovations and technologies:

- Improved accuracy and representative measurement of hydro meteorological variables through improving the observation density of the monitoring to capture the large spatial and temporal variability in hydro meteorological processes.
- Implement flood hazard and risk assessment, modelling and mapping methods and technologies and building of long-term institutional capacity for such assessments. Importantly, it will help establish the comprehensive single source of definitive flood and risk hazard mapping of the appropriate technical specification and level of detail for all uses.
- support the development of platforms for regional coordination and cooperation on flood risk management and the dissemination and sharing of flood risk information using existing information systems.
- the project will address the lack of socio-economic data and relevant capacities for risk, damages, losses, exposure and vulnerability assessments by developing and harmonizing methodologies and technologies for the systematic collection of socioeconomic information required to assess climate induced hazard damages, losses, exposure and vulnerability. It will address the lack/absence of methods and tools for at municipal and community levels by introducing and standardizing methods of damage and loss assessment and PDNA assessment.
- the project will address the limited capacity and resources to implement cost-effective climate-induced strategic flood risk reduction and adaptation activities by strengthening national capacities for developing and implementing FRM plans, based on hazard and risk information and through the detailed design and implementation of priority risk reduction structural measures. Thus, directly increasing resilience in targeted areas, and will enable long-term FRM investment planning of intervention measures.

C. Describe how the project / programme would provide economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme would avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

144. The project is a direct response to the priorities that have emerged from the National Communications of the Riparian Countries and the priorities identified in light of recent significant flooding in the basin, as identified by a range of stakeholders, including community representatives and members affected by flooding. The project is designed to respond to the flood risks to the most vulnerable communities in the Drin river basin (including marginalized groups such as the Roma community), by transferring best available technologies for climate resilient flood risk management. In so doing it will directly benefit at least 250,000 people estimated to be at risk from extreme floods in the Riparian countries. Indirectly the project will also benefit all of the 1.6 people living in the DRB by improved basin-level flood risk reduction and consequent social, economic and environmental benefits.

145. The project will improve the knowledge base on flood risk through fully developed modelling and flood mapping, which also improved the understanding of required hydrological flows to wetlands in order to maintain ecosystems services. 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 DRB will benefit from improved lead warning times to flood events (disseminated in an inclusive manner, accounting the needs of a range of stakeholders) due to improvements in the hydrometric monitoring network which underpins the forecasting and early warning systems. Implementation of spatial planning policies, which include zoning of economic activities and development away from high flood risk areas, will lead to reduced exposure of the target population in the DRB. Overall vulnerability of communities in DRB to flooding will be reduced due to increased awareness and direct engagement of local communities in flood risk management. Adaptation of climate resilient land use practices by communities will increase their adaptive capacity and reduce exposure and safeguard their assets. Targeted training in FRM functions will further increase adaptive capacities within municipalities.

146. The project will have sustainable development co-benefits including ecosystem services protection, rural income generation, livelihood enhancement and job creation, improved access to education and training opportunities, which account for gender and social inclusion considerations, and improved resilience of physical assets of communities. The main ***economic co-benefits*** from the project investment are derived from the avoided socio-economic losses from flood disasters. Under climate change, economic losses are expected to increase, which could significantly impact and reverse socio-economic development gains of the Riparian countries. Avoided losses to sectors such as hydropower could be significant. Climate flood risk informed sectoral planning will help build national and regional resilience. Climate risk information will also safeguard assets such as transportation networks which are critical to the economic development and functioning of communities. Economic co-benefits will also be realized in all productive sectors within Riparian countries due to prevention of losses.

The project will avoid reinforcing existing gender equalities in the region and have significant gender co-benefits and will embed nationally appropriate gender consideration in each Riparian country. The project will therefore safeguard local communities and their assets from flood disasters with particular attention to women and other vulnerable groups (marginalized, elderly, disabled). ***Environmental co-benefits*** mainly relate to strategies which will provide water retention functions; regulation of hydrological flows (buffer runoff, soil infiltration, groundwater recharge, maintenance of base flows, adequate water availability to wetlands); natural hazard mitigation (e.g. flood prevention, peak flow reduction, soil erosion and landslide control); increased streambed stabilization resulting in decreased erosion, habitat preservation, and reforestation which will be derived mainly from non-structural measures to be implemented.

D. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme and explain how the regional approach would support cost-effectiveness.

147. The project addresses the fundamental barriers to achieving integrated climate-resilient river basin flood risk management in order to improve their existing capacity to manage flood risk at regional, national and local levels and to enhance resilience of vulnerable communities to climate-induced floods. The countries will benefit from a basin-wide transboundary flood risk management (FRM) framework based on: improved climate risk knowledge and information; improved transboundary cooperation arrangements and policy framework for FRM and; concrete FRM interventions. This will enable the countries to address flood risk in a coordinated and harmonised manner, rather than in isolation, which has significant cost-effectiveness and efficiency benefits.

148. The combination of interventions related to structural and non-structural interventions, as proposed by this project, has been shown to lead to significantly larger improvements in resilience to communities, compared to only a single intervention approach. In particularly, the alternative approach of using only structural measures alone has been shown to be ineffective due to costliness of measures, limitation of adequate level of protection that they can be built to provide given that defenses cannot eliminate all floods on its own, of limited environmental benefit, of limited useful lifespan particularly with climate change. Building of flood defenses alone, can also lead to maladaptation by enabling continued development behind such structures, thus providing a false sense of security when potential failure of structural measures are not taken into consideration or when other approaches such as flood forecasting and early warning, development control, risk transfer mechanisms and EbA approaches are not included in the solution.

149. By addressing the capacity to undertake risk monitoring, assessment and modelling and to generate missing basin climate risk information, the project will lay the foundation for flood risk management in the future. In addition, by addressing the regional and national policy gaps, the project is ensuring long-term sustainability of project interventions. Furthermore, the adoption of this holistic and integrated approach that addresses all the root causes, will have long-term efficiency and effectiveness benefits, compared to the ad hoc, ex-post, non-climate-responsive approach to flood risk management that are currently undertaken by national governments.

150. In Albania the 2010 flood resulted in 35 Million USD in damages, while in Montenegro it resulted in $45 Million USD, most of which occurred in the downstream areas of the Drin basin. Hence a minimum of $80 Million USD in damages resulted. The average expected losses for Albania per year is estimated to be around 3.2 million USD, which if prorated, would result in average annual damages of about 10 Million basin wide. Assuming that the project interventions will result in a 50% reduction in damages for flood events of the magnitude of the 2010 event, the project has the potential to avert damages of $40 Million for a single flood event, and 10 Million USD for and annual flood event, through the investment of a relatively modest $9.3 Million USD.

151. Under output 3, the AF $5 Million USD investment will provide structural and non-structural measures in Macedonia which will protect 3,550 ha, 6,500 people (direct beneficiaries) 2,500 houses, 40 km of roads, 40 industrial unit, a central waste water treatment plant and a landfill site in the municipality of Struga and Ohrid, possible flooding of Ohrid international airport, flooding of schools, churches, monuments. In Montenegro, structural measures in Ulcinj municipality will benefit 20,000 people (population of the municipality), including 2,000 people living in six most vulnerable villages. In addition these measures will protect approximately 30,000 tourists visiting the Ulcinj municipality every year during summer season (source FRM Plan for Ulcinj Municipality, 2013). In Albania, structural and non-structural measures will reduce the flood risk to 14,100 ha of land, 4600 houses that are inundated regularly, and 12,150 people. The 5 Million investment will result in significant aversion of annual average damages in these areas as well as for larger flood events.

152. The proposed structural and non-structural solutions are designed to embed best practices, community ownership, and synergies across the three outputs and inter-related activities and builds on ongoing efforts to ensure their efficiency and cost-effectiveness. The implementation of structural and non-structural measures under the AF project in the three Riparian countries and the embedding and use of the climate proofing design standards and methodologies for such designs will serve as significant examples for implementing climate proof flood risk management measures in the future and will have significant benefits for scaling up and replication in the rest of the basin and in other parts of the Riparian countries. In addition, the development of the river basin longer-term flood risk management strategy under component 2, which will identify other structural and non-structural measures using CBA and appraisal-led optioneering methods introduced by the project, will ensure that the implementation of such measures in the future will be within the agree FRM basin strategy thus ensuring that basin-wide impact will be achieved in the longer term and synergy with parallel interventions.

153. The proposed project builds upon lessons learned and success of the past and on-going interventions, existing data/information, institutional and management frameworks and capacities and, communications and coordination mechanisms being built under the GEF Drin project and Drin MOU instrument.

154. Comparable efforts (EWs, climate information, and community-based DRM) have shown effective impact related to saving of lives, assets, and livelihoods.

155. The project offers a cost-effective alternative to conventional/baseline reactive approaches to risk management that builds around ad-hoc recovery investment and compensations, predominance of large scale hard defense infrastructure and limited community engagement. The AF project will catalyze shift to more cost-effective and efficient approaches to resilience building. The new approach is based on enhanced risk knowledge that allows proactive action to reduce exposure of people and economic assets to hazardous events, enhanced design of risk reduction investments, a combination of structural and non-structural measures, enhancing adaptive capacities of local communities. The regional cooperation and coordination on flood risk management and climate risk information management is another factor of the AF project efficiency.

E. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist. If applicable, please refer to relevant regional plans and strategies where they exist.

156. The project is consistent with the climate change adaptation priorities outlined in the National Communications of Albania, FYR Macedonia and Montenegro. All three beneficiary countries launched their National Adaptation Planning (NAP) processes recognizing above all climate risks and vulnerability of their economies and communities to climate-induced floods.

157. The National Strategy for Development and Integration (NSDI) ***of Albania*** for the period from 2014 – 2020 presents both the government's vision for national goals for the social and economic development of Albania, as well as sector-specific plans for achieving this vision over the period. Most of the sector strategies under the NSDI include acknowledgement of the impacts of climate change. The Environment cross-cutting strategy under the NSDI, fully integrates climate change and highlights the lack of institutional and individual capacities to evaluate climate change impacts and need for adaptation action particularly in coastal zones and river basins, where tourism is a large economic driver and urban and transportation infrastructure and agriculture land is especially at risk from climate impacts such as flooding. The proposed AF project will support Albania's newly established Agency of Integrated Water Resources Management and the Ministry of Tourism and Environment to ensure a comprehensive watershed management in Drini River that accounts for the growing renewable energy industry, land use planning as well as road, urban, and other infrastructure.

158. The National Adaptation Process was launched in Albania in 2015 with the support of GIZ and UNDP. A preliminary roadmap for NAP implementation was formulated and validated by representatives. The Government of Albania will be developing a detailed NAP strategy action plan with the support of the Green Climate Fund and UNDP. Vulnerability to climate induced flood risks and the needs to increase the resilience to floods is recognized in the NAP documents and process.

159. The Former Yugoslav Republic of **Macedonia** priorities and development needs are reflected in the Government Programme 2017-2020. The project will contribute to the implementation of the Government priorities from the abovementioned programme, particularly the goals set for the following sectors: protection of the environment and nature, agriculture, forestry and water economy, as well as foreign affairs and European integration. More specifically the Strategy for environment protection and climate change 2014-2020 prepared by the Ministry of Environment and Physical Planning in 2015 will be an important instrument for the future vision on integrated river basin management plan.

160. The project will support the intention of the Government to introduce an integrated system of water management, including establishment of a database for all water resources. Also, the project will directly contribute the Government's idea to initiate the development of operational plans for flood protection and public educational campaign for flood risk protection country wide. The clearest contribution of the project will be linked to the support of the Government efforts for the development of a contemporary hydro-

meteorological system, particularly in the agricultural regions, and establishment and operationalization of an early warning system on the whole territory of the country. Strengthening of the water monitoring systems, and implementation of the EU Water Framework Directive and the EU Flood Directive are one of the priorities of the Strategy for environment protection and climate change 2014-2020. This Strategy also calls for an integrated river basin management and establishment of a system for flood risk assessment, and flood risk management.

161. The first Nationally Determined Contribution (NDC) under the Paris Agreement ***of Montenegro*** states that "The region of South East Europe, including Montenegro, is highly vulnerable to the impacts of climate change thus avoiding dangerous climate change is of paramount importance for the country."

162. The Montenegrin National Strategy of Sustainable Development until 2030 (NSSD) established a comprehensive framework addressing challenges the country is facing on its path towards sustainable development by 2030, while considering the EU accession requirements. In this context, the NSSD also sets the platform for translating Agenda for sustainable development into the national framework. The management of natural resources (including waters) and corresponding sectorial strategies and financial frameworks have to be aligned with the NSSD 2030.

163. The Water Management Strategy defines long-term directions of water management and includes the assessment of the current situation in water management, goals and guidelines for water management, measures to achieve the established objectives and the projection of the development of water management. The overall objective of the Strategy is to achieve a uniform and fully harmonized water regime of Montenegro both in Adriatic and Danube basin.

164. The National Strategy with Action Plan for transposition, implementation and enforcement of the EU acquis on Environment and Climate Change (NEAS) 2016-2020 was adopted to achieve gradual and complete transposition of the entire EU acquis for Chapter 27-Environment and Climate Change into the legal system of Montenegro. In November 2013 based on the Screening Report presented by the EC, Council decided that Montenegro needs to fulfill the opening benchmark to open the negotiations with the EU for Chapter 27 (Environment and Climate Change).

165. The Strategy for Disaster Risk Reduction (DRR) with Action Plan for the period 2018-2023 is based on reducing the disaster risks and their main causal factors, proper land management and environmental protection, lowering exposure to hazards as well as vulnerability of people and property and improving overall preparedness for disasters. The DRR strategy highlights that the frequency of the meteorological and hydrological hazards and the damage they have been causing is increasing.

166. The most relevant regional strategy that the proposed project will build upon and contribute to is the **Drin River Basin Strategic Action Programme (SAP)** that is being developed in the framework of GEF Drin project. The proposed Adaptation Fund project will, above all, develop the Drin Integrated CCA and FRM Plan to be embedded as a sub-plan of the Drin SAP, and how two projects will be linked institutionally (see section G. for details).

167. Another important regional process affecting policy development in the Western Balkans is the EU enlargement and legislative alignment. In February 2018 the European Commission adopted a strategy for 'A credible enlargement perspective for and enhanced EU engagement with the Western Balkans'. The Western Balkans Investment Framework (WBIF) is a regional blending facility supporting EU enlargement and socio-economic development (see section G. for details).

168. **Regional Strategy for Sustainable Hydropower in the Western Balkans** is a sub-project under implementation by the WBIF-IPF3 Consortium led by Mott MacDonald, with the European Commission, DG NEAR D.5, being the Contracting Authority for the WBIF-IPF3 contract. The six Western Balkan beneficiary countries comprise Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Kosovo*, Montenegro and Serbia - the WB6 region. The strategy includes the following actions under hydrology, integrated water management and climate change, which will be undertaken for priority basins

that have been identified for hydropower development. Many of these activities align with the proposal activities of the AF project which will benefit from close coordinate with this action plan:

a. Implement a full-scale monitoring system on water quantity, including meteorology and surface characteristics enabling analysis of climate change impact on watershed run-off
b. Implement WFD not only in strictly legal terms but substantiate water management organisation and practice.
c. Plan new set of hydrologic studies including modelling of run-off for prioritised river basins.
d. Integrated water management plans are first step of water resources utilisation management at river basin level.
e. Publicise the knowledge acquired through preparatory work on planning and realisation of hydropower stations in the Region
f. Upgrade state owned hydrometeorology systems and expand existing network according to energy, water use and climate change needs appropriately to priority river basins
g. Continue realising adequate measures (in detail in BR 3) that consider and protect biodiversity and ecosystem services
h. Enable exchange of information on the official hydrological and meteorological data in the Region (it is efficient to implement the case of Danube river projects) among all riparian countries (priority at the Drini/Drim River Basin.
i. Prepare for public participation activities from the hydrology point of view as equally important with other planning issues
j. Prepare guidelines for future hydropower projects, based on lessons learned, incl. costing issues, best practice of mitigation considering offsets, followed by development of a comprehensive action plan for the sustainable development of the hydropower generation potential of the river and its tributaries
k. Pre-planning mechanisms allocating “no-go” areas for new hydro-power projects should be developed. This designation should be based on a dialogue between the different competent authorities, stakeholders and NGOs.
l. Develop specific guidelines on environment and water related rehabilitation of existing hydropower stations and include good description of hydrology related subjects, such as data quality, climate change, tendencies in run-off, etc.
m. While planning, climate change modelling should be done on a project development basis

F. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

169. All activities of the AF project, except for activities under the Outputs 3.2 imply implementation of soft, non-structural measures that do not require any government licenses and permits. For hydrometric and other equipment to be procured under the Outcome 1 the project will analyze and choose optimal locations for the new observation equipment to minimize the risk of damages to the extent possible. Siting of gauging stations will follow international standards which will consider the safety of stations.

170. Flood defense structures that will be constructed/rehabilitated under the Output 3.2 will adhere to all international standards, as well as national technical standards and building codes according to the Environmental Legislation of the three beneficiary countries, including requirements for Environmental and Social Impact Assessment (ESIA). All works will be subject to design and will meet local technical environmental and social laws and standards. Where relevant, local regulations will be followed. The project will ensure the adherence of all construction activities to national standards as well as to the Environmental and Social Policy of the Adaptation Fund and to the UNDP safeguards policies.

171. During the full AF proposal development, UNDP’s Social and Environmental Screening Procedure was applied in order to screen all possible environmental and social risks, to maximize co-benefits, as well

as to propose management and mitigation measures. The SESP is provided in Annex 6 of the proposal and is accompanied by the Environmental and Social Management Plan (ESMP) provided in Annex 7, which summarized the impacts and approaches to management and mitigation. As complementary documents to the SESP, a Stakeholder Engagement Plan was prepared, which provides consultation record of the discussion which a broad range of primary and secondary stakeholders that were pivotal to project design. Similarly, a Gender Assessment and Action Plan (GAAP) was prepared to understand the project gender context and propose gender-sensitive actions accordingly. The GAAP can be found in Annex 8.

G. Describe if there is duplication of project / programme with other funding sources, if any.

172. During the development of this proposal an analysis of the baseline projects and initiatives relevant to the proposed AF project implementation has been conducted in order to avoid duplication and secure strong synergies and coordination. The following projects and programmes are relevant to the AF initiative.

173. ***Enabling transboundary cooperation and integrated water resources management in the extended Drin River Basin:*** The GEF-funded UNDP Drin Project promotes joint management of the shared water resources of the transboundary Drin River Basin, including coordination mechanisms among the various sub-basin joint commissions and committees. The Project assists to: (i) build consensus among countries on key transboundary concerns and drivers of change, including climate variability and change, reached through joint fact finding; (ii) update the shared vision; (iii) reach an agreement on a program of priority actions deemed necessary to achieve the vision; (iii) strengthening technical and institutional capacities; (iv) operationalize the institutional structure of the Drin Coordinated Action, rendering it capable of undertaking its coordinative and executive role. The Project is implemented by UNDP and executed by the Global Water Partnership-Mediterranean (GWP-Med). The Drin Core Group is the Steering Committee (SC) of the Project.

174. The project has the following expected outcomes:

- Component 1: Consolidating a Common Knowledge Base
    - Outcome 1 - Consensus Among Countries on Key Transboundary Concerns, Including Climate Change and Variability, Reached Through Joint Fact Finding.
- Component 2: Building the Foundation for Multi-Country Cooperation
    - Outcome 2 - Visioning Process Opens the Way for Systematic Cooperation in the Management of the Transboundary Drin River Basin.
    - Outcome 3 - Countries and Donors Commit to Sustain Joint Cooperation Mechanisms and to Undertake Priority Reforms and Investments
- Component 3: Institutional Strengthening for Integrated River Basin Management (IRBM).
    - Outcome 4 - The Operationalization and Strengthening of the Institutional and Legal Frameworks for Transboundary Cooperation will Facilitate Balancing of Water Uses and Sustaining Environmental Quality throughout the Extended Drin Basin.
- Component 4: Demonstration of Technologies and Practices for IWRM and Ecosystem Management.
    - Outcome 5 - Benefits Demonstrated on the Ground by Environmentally Sound Approaches and Technologies New to the Region.
- Component 5: Stakeholder Involvement, Gender Mainstreaming and Communication.
    - Outcome 6 - Public Support and Participation to IWRM and Joint Multi-Country Management Enhanced Through Stakeholder Involvement and Gender Mainstreaming.
    - Outcome 7 - Political Awareness at All Levels and Private Sector Participation Strengthened through Higher Visibility of the Project's Developments and Targeted Outreach Initiatives

175. The proposed AF project will work closely with the existing Drin Project and will benefit from and build upon the outcome of the project including in the following areas: 1) The Monitoring and Information Management System (IMS) being development by the project will form the basis of the flood risk information sharing to be established with the proposed AF project. In effect, a flood component may need to be added

to the platform being developed. In addition the Transboundary Diagnostic Analysis (TDA) of the existing project will form the basis of the flood risk-specific analyses to be undertaken by the proposed AF project; 2) The Drin Integrated CCA and FRM Plan to be developed under the proposed AF project (Output 2.3) will be embedded as a sub-plan of the Strategic Action Program (SAP) of the GEF project; 3) Proposed AF project will use the existing Core mechanisms for coordination and cooperation at the basin level through the Drin Core Expert Working Group on Floods; 4) Outcome 4 - output 11 of the GEF project "A program of on the ground pilot demonstrations focusing on: water use efficiency measures, reduction of nutrients, land use planning, groundwater protection, floods and droughts, sustainable tourism and flood risk management" will provide a pilot project to the proposed AF project.

176. ***South-East European Multi-Hazard Early Warning Advisory System*** – USAID/OFDA 565,000.00 CHF. The project includes development of a regional multi-hazard early warning advisory system – consisting of information and tools for forecasters at National Meteorological and Hydrological Services (NMHSs) and harmonized national early warning systems. The first phase of the SEE-MHEWS-A project in 2016-2017 was supported by the U.S. Agency for International Development (USAID), Office of U.S. Foreign Disaster Assistance. SEE-MHEWS-A will provide operational forecasters with effective and tested tools for forecasting hazardous weather events and their possible impacts in order to improve the accuracy of warnings and their relevance to stakeholders and users. On a single virtual platform, the system will collect existing information, products and tools for the provision of accurate forecasts and warnings to support hazard-related decision-making by national authorities. Furthermore, the system will function as a cooperative platform where forecasters from different countries can work together on the identification of potential hazards and their impacts, especially when impending weather hazards may have potential impacts in many countries

177. During the inception phase, a detailed Implementation Plan was developed that provides guidelines for development of the technical part of the system and for all activities necessary to establish advisory system operations by mid-2023. In addition, the plan considers the governance structure and other management aspects of the project implementation. The plan was developed as a joint effort between WMO, NMHSs of the region, and numerous collaborators, including WMO Regional Specialized Meteorological Centers, research institutions, numerical weather prediction consortia, and European and US meteorological and/or hydrological service.

178. During the inception phase, the proposed AF project establish a partnership with this project to ensure cooperation and avoid duplication of effort. This would be particularly important with regards to the information tools to be developed by the South***-East European Multi-Hazard Early Warning Advisory System,*** which are likely to be complimentary to the FA project objectives. The project has already undertaken a number of capacity building activities including a workshop on Common Alerting Protocols (CAP) Implementation, Forecaster's workshop, and a workshop on ICT technology and observational requirements. It would be important to analyze additional training needs to be met which will be important for the capacity building to be undertaken under the proposed AF project, and for the longer-term capacity development plan to be established (Output 2.2).

179. ***IPA DRAM – Programme for Disaster Risk Assessment and Mapping in Western Balkans and Turkey:*** IPA DRAM is addressing the need to further strengthen capacities in the field of civil protection and general risk management in the Western Balkans region, and coordination both within the region and with sister agencies in EU-countries. The Programme for Disaster Risk Assessment and Mapping (IPA DRAM) further contributes to enhancing the capabilities of the partner countries to strengthen disaster risk management by creating an open platform for the development and improvement of national disaster loss databases, enhancing the coherence among the national systems and methodologies, and consistency with existing EU regulations, guidelines and good practices.

180. The proposed AF project will aim to work closely with the IPA DRAM project which is implementing best practice and harmonizing methodologies, tools and databases for damage and loss. This will be particularly relevant for proposed Output 1.3.

181. GIZ-implemented project "***Climate Change Adaptation in Transboundary Flood Risk Management, Western Balkans***" (CCAWB is working closely with partners and pursuing a multi-level

approach, support is provided mainly by means of capacity development, advisory services, and procurement of equipment.

182. The project has achieved the following, according to the Fact Sheet:

- Riparian countries have agreed on data exchange to further improve flood early warning and trans-boundary flood risk management. As a result, an estimated 30.000 people potentially affected by floods can be warned in advance.
- 20 additional sensors are providing online data to the Hydro-meteorological services in the four countries.
- Hydrological flood forecasting model of the whole basin is developed.
- 12 professionals of the four national Hydro-meteorological Services are trained and enabled produce regular flood forecasts.
- More than 50 professionals from local authorities from Albania, Macedonia and Montenegro are trained in the use of GIS software for more effective flood risk management.
- Flood risk areas are defined and mapped at basin level, in line with the EU Flood Directive, and a catalogue of measures for transboundary flood risk management is created for the Basin.
- At least 10 km of drainage channels in Shkodra region are being cleaned up to reduce the risk and severity of floods.
- Civil emergency structures are supported with know-how, tools and equipment to better perform their work.
- Students and teachers of at least 18 schools in the risk areas of Albania and Montenegro will benefit from awareness campaigns on flood preparedness and reaction.
- The National Adaptation Plan and its financing strategy are finalized for Albania.

183. GIZ, under the project "Adaptation to Climate Change in transboundary Flood Risk Management, Western Balkans" is planning to extend its current activities on flood risk management of the Drin basin. The following are excerpts from GIZ stated approach for its third phased of the project:

Building on previous achievements, CCAWB, in its third phase, will consolidate the results in flood forecasting, risk assessments and local preparedness with a view to supporting the four elements of early warning according to the UNISDR definition (see below). In order to achieve this, the project will work in the following fields:

Output 1 – Flood Hazard and Risk Mapping
Strengthening capacities for meaningful (including transboundary) flood risk assessments will provide the information necessary for prioritising technical, financial and policy decisions in the area of flood risk management – thus strengthening adaptive capacities of institutions and the affected population. All activities in this area of work will be conducted in accordance with the EU Flood Directive, focusing on Step 2 of the directive: the development of flood hazard and risk maps (FHRM). The FHRM will provide the basis for the review and development of local Flood Risk Management Plans (FRMP). The actual FHRM will be conducted by the partner institutions themselves. GIZ will support them with technical, methodological expertise and process facilitation, bring in experiences from other European countries, and provide capacity building and training.

Expected results:
*o Hazard and risk maps for **selected risk areas**[32], reflecting user needs, ideally harmonised across borders,*
o Recommendations for risk management,
o Documentation of lessons learned,

[32] Extensive discussions with GIZ concluded that GIZ will only directly fund the modelling and mapping of the Lake Skhoder/Skadar and Bojan-Buna River area (ASPR codes AL4-6 and ME3-6 in Figure 3 above) but would strengthen capacities of institutions to undertake modelling of other areas they deem as important, at a later date. GIZ also suggested that it would also like to model the area north of Lake Ohrid, however the FYRM has asked that the detailed modelling of this area be undertaken by the AF project as UNDP has already undertaken extensive modelling of the area as discussed in Annex 8 and will continue to do so for the ongoing work in this area.

o Field-tested and agreed methodology and approach for participatory FHRM, documented in a guideline/ step-by-step manual, incl. policy recommendations,
o Increased capacities of users of maps (e.g. civil protection, spatial planning, etc.),
o Training-of-Trainers concept and national/ regional pool of trainers for FHRM,
o Replication of successful approaches in other risk areas.

Output 2 – Early Warning
CCAWB will work with local authorities and civil society organisations in selected pilot areas to improve local warning and response mechanisms, i.e. the so-called 'last mile'. It will provide technical and organisational advice to NHMS to further improve the forecasting system while strengthening their capacities as warning service providers. Key players in warning dissemination and response, i.e. entities in charge of civil protection and disaster management, will also be strengthened. The concrete work in pilot areas will be used to engage all relevant actors of the national warning chain in the individual countries. CCAWB will bring the different stakeholders of the warning chain together to jointly review and improve, i.a., Standard Operating Procedures (SOPs), warning content and channels, as well as dissemination technology, for meaningful and timely early warning and effective response. While formal early warning falls within the exclusive mandate of a nation-state, regional cooperation and information exchange can benefit national action, and eventually the population at risk. Therefore, the project will encourage transboundary cooperation, e.g. in the border areas of Albania and Montenegro.

Expected results:
o Continuous, improved flood forecasting based on the Panta Rhei model,
o Jointly developed recommendations for warning levels, for flood early warning in the four countries,
o Effective SOPs for early warning applied in selected risk areas, as validated in simulation exercises,
o Step-by-step manual for improving early warning at the local level, incl. policy recommendations,
o Training modules and Training-of-Trainers concept as well as national/ regional pool of trainers.

Output 3 – Institutional development
Sustainably improving flood risk management requires strengthening the institutions that are in charge. The project will support actors at national and local levels, including the authorities in charge of water resources management, the NHMS, disaster risk management and civil protection agencies, as well as local authorities. It will provide organisational and strategic advice for selected stakeholders, strengthening the institutions' capacity for coordination and cooperation, e.g. in the field of early warning. As a cross-cutting issue, Output 3 is closely related to the activities for the other two outputs. Concrete activities depend on further consultation with the partners in the four countries and a joint organisational analysis in the coming months

184. Since GIZ will be undertaking modelling in only selected areas (see footnote 35 above), there will be no overlap with the AF project which will be taking a river basin approach with detailed flood hazard modelling of areas upstream of Lake Shkoder/Skadar and Bojana-Buna area with the intention to incorporate GIZ's Lake Shkoder/Skadar and Bojana-Buna area. It should be noted that the GIZ model of the Lake Shkoder/Skadar and Bojana-Buna area, will be required for the detailed design of the structural measures for both Montenegro and Albania. So close cooperation with GIZ will be established to ensure that the model will be made available and meets the needs for detailed design, the timeframe of GIZ project should be assessed vis a vie the need for the riparian to start the implementation of the measures. In addition as the riparian countries would have developed and agreed the methodology for EUFD modelling, it is expected the modelling by AF and GIZ project will be compatible. In terms of the early warning system the AF project will expand the hydrometric network which will enhance the flood forecasting model accuracy, and it will digitize data for existing stations not currently within the forecasting model. These activities are complementary to the GIZ activities and have no areas of overlap. GIZ's Output 3 is focused on institutional capacity development which is complementary to capacity development to be undertaken through the AF project which is development the long-term capacity development plan and implementing training.

185. The AF project will build upon the extensive work already undertaken by GIZ on flood risk management in the Drin basin, and will aim to work closely with GIZ on the Implementation of flood hazard mapping for the Drin Basin under their new project and under proposed AF Output 1.2.

186. **Danube River Basin Hydromorphology and River Restoration (DYNA)" Project**, implemented/executed by WWF/ICPDR which has the objective: To "Strengthen integrated and harmonized approaches for river restoration and aquatic biodiversity conservation in the Danube River Basin (Bosnia-Herzegovina, Moldova, Montenegro, Serbia, and Ukraine)". The project has three technical components:

Component 1 - Regional harmonization: increased regional capacity in the field of hydro morphology and better coordination of non-EU Member States in the Danube river basin will be established resulting in harmonized preparation and implementation of regional river basin and flood risk management plans and measures.

Component 2 - Improved country level planning: focus will be on integrating hydro morphological aspects adequately into country level river basin and flood risk management planning as well as emerging related governmental strategies and programmes such as those on climate change resilience and adaptation. In Montenegro, the focus over the coming years will be on capacity building and training on flood control and integrated water resources management in line with WFD and Flood Directive, with emphasis on hydro morphological assessment and flood control. Support will be requested for data collection and studies for smaller rivers which are causing problems with flash floods.

Component 3 - Implementation of pilot measures: will involve the preparation and/or implementation of at least one transboundary pilot project across two non-EU Member States and one pilot each per non-EU Member State, demonstrating hydro morphological and integrated approaches in river basin and flood risk management planning and implementation

187. **Protection and Sustainable Use of the Dinaric Karst Aquifer System project – DIKTAS Project**, is a regional project aimed at improving the management of karst groundwaters in the Dinaric Karst shared by several countries in South-Eastern Europe (extends from NE Italy through Slovenia, Croatia, Bosnia & Herzegovina, Montenegro to Albania. Karst formations connected with the Dinaric carbonate chain also outcrop in Serbia, FYR Macedonia, and possibly in NW Greece). It is the first ever attempted globally to introduce sustainable integrated management principles in a transboundary karst freshwater aquifer of the magnitude of the Dinaric Karst System and aims at focusing attention on the vulnerable water resources contained in karst aquifers (carbonate rock formations), which are poorly understood. The Dinaric Karst Aquifer System, shared by several countries. and one of the world's largest, has been identified as an ideal opportunity for applying new and integrated management approaches to these unique freshwater resources and ecosystem. At the regional level the project's objectives are to: (1) Facilitate the equitable and sustainable utilization and management of the transboundary water resources of the Dinaric Karst Aquifer System, and (2) Protect from natural and man-made hazards, including climate change, the unique groundwater dependent ecosystems that characterize the Dinaric Karst region of the Balkan Peninsula.

188. These objectives, which aim to contribute to sustainable development of the region, are achieved through a concerted multi-country effort involving improvement in scientific understanding, the building of political consensus around key reforms and new policies, the enhanced coordination among countries, donors, projects and agencies, and the consolidation of national and international support.

189. DIKTAS is a full-size GEF regional project, implemented by UNDP and executed by UNESCO-IHP. The core DIKTAS project partners are four GEF fund-recipient countries of the Dinaric region, namely Albania, Bosnia and Herzegovina, Croatia and Montenegro.

190. The **Western Balkans Investment Framework (WBIF)** is a regional blending facility supporting EU enlargement and socio-economic development in Albania, Bosnia and Herzegovina, Kosovo*, the former Yugoslav Republic of Macedonia, Montenegro, and Serbia. Under the WBIF the project **Gap Analysis/Needs Assessment in the Context of Implementing the EU Floods Directive in the Western Balkans** was undertaken which produced a report on the gaps and needs related to the implementation of the Floods Directive in the Western Balkans and the assessment of the planned projects (non-structural and structural measures) in the WB countries. The outputs are country specific and regional FD implementation plans and prioritized project lists. Under the WBIF, **The Sava river basin flood management Project** is being implemented under this facility in Montenegro, Bosnia and Herzegovina, Serbia. This project aims to address flood risks within the wider Sava river basin by creating a regional flood risk management plan as well as a flood forecasting and warning system. For this purpose, the WBIF has awarded a €2 million grant in June 2014. The project Drina River Basin Water Resources Management

is also being implemented through WBIF funding, covering Montenegro, Bosnia and Herzegovina, Serbia. The overall objective of this project is to support more effective water resources management in Drina River Basin with a special focus on flood and drought mitigation, and hydropower and environmental management, based on "good practices" and within the framework of integrated water resource management. This project proposes to give special consideration to plans and strategies in the energy sector in the wider region, in order to determine the most important operational and investment interventions in the basin.

191. While having achieved some discernible change in flood risk management, these baseline initiatives need to be consolidated and built upon in order to achieve transformative change in resilience of, existing and emerging, climate-induced flood risk to the population of the Drin Basin.

192. Given the number of on-going regional initiatives on flood risk management in the Drin basin, the project will look to coordinate activities to avoid duplication and overlap. Consultations are on-going with all key existing and planned project implementors to develop a clear strategy for coordination and cooperation by the full proposal stage. A review will be undertaken of all previous and ongoing relevant national and regional studies to identify lessons learned which this project can build upon. The Ongoing GIZ project in the Drin basin will provide opportunities for coordination of efforts, however, further consultations are needed to ascertain the scope of planned activities to identify synergies and areas for cooperation.

193. The proposed AF project is unique in its scope and provides an opportunity to consolidate and build upon experience to date. It will be the first project to implement a comprehensive integrate flood risk management approach for the Drin basin and will be critical to providing a benchmark for how the Riparian countries undertake flood risk management in other basins. In doing to the project will aim to identify the potentially relevant synergies with relevant regional organizations including the International Commission for the Protection of the Danube River (ICPDR) and International Sava River Basin Commission (ISRBC), including how their inter-regional coordination mechanisms may be leveraged and applied to the Drin. In addition, regional projects with relevant technical themes will be of great importance to ensure harmonized and synergistic approaches to flood risk management in the countries in which these regional projects are being implemented

H. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

194. The knowledge management (KM) of the project will be embedded under Outputs 2.2 and 3.3 and will have the following key aims:

(i) To ensure access to data and information generated by the project as well as long-term access to data on which stakeholders' essential institutional functions rely and/or data and information that can be used for evidence for policy and practice advice (**connecting people to information and knowledge**)

(ii) Connect key stakeholder groups, practitioners and experts to ensure that key learning and experience is shared within and across sectors (**connecting people to people**)

(iii) Ensure staff in the stakeholder institutions know about effective and relevant KM techniques so that knowledge is shared, captured and retained by the institutions and shared within and across the sector (**institutional KM improvement**)

(iv) By developing and promoting KM as a tool for continuous and sustainable improvement and ensuring that KM tools generated by the project will be systematically used and maintained within the stakeholder institutions (**Developing and embedding KM tools and practices**).

Connecting people to Information and knowledge

195. The project will build on the foundation of previous knowledge. New knowledge gained on the project will be captured and stored appropriately for others to access and learn from. The following series

of tools and techniques will be employed to enable people to find information and knowledge more effectively throughout the project.

- *Case Study* – At least 5 case studies will be generated per year of the project
- *Rapid Evidence review* – Project inception studies will establish the project baseline which will be updated throughout the project as it progresses and published in various technical and non-technical documents.
- *Knowledge Banks (web databases)* – The project will develop a knowledge and data management website for all project, stakeholder and beneficiary staff

Connecting people to people

196. The following series of tools and techniques describe how knowledge management will enable people to connect to people more effectively.

- *Community of Practice (CoP/Knowledge network/professional network)* – The project will set up a number of technical working groups, riparian countries' interagency working groups as well as regional working groups to enable practitioners (CoP) to interact and share experiences
- *Peer Assist* – The project will engage a range of local and international experts who will provide technical assistance to the project. For long-term peer assist, the project will help establish relationships between institutions and local as well as international universities and research centers
- *Knowledge café* – This will be achieved through the meetings of the technical working groups and through bi-lateral meetings between individual stakeholder organizations
- *Knowledge marketplace* – This will be provided by project experts who will be identifiable by their area of expertise and will provide support to the project and stakeholders. In the long-term, a 'directory' of experts can be developed to fill this need.

Institutional KM improvement

197. Summarizing lessons learnt and experiences and sharing them with others can help build and retain knowledge. The following series of tools and techniques describe how the project knowledge management will enable improvement through impact assessments, evaluations and people management.

- *Gone well/not gone well* - All significant project events/activities will be subject to a debrief to capture good/bad points and lessons learned
- *After Action review (AAR) formative evaluation* - All significant project events/activities will include formal minutes which will be made available on project portal
- *Retrospective review (summaries evaluation)* - A formal project lessons learned document will be available for all project staff to complete (managed by PM) online
- *Knowledge Exchange* - All project staff will have as final deliverable a summary report to include knowledge transfer information and other lessons learned

Developing and embedding KM tools and practices

198. During project formulation and planning, the number and types of Knowledge Management tools that will be developed will be further detailed.

199. As far as possible, all KM tools will be provided as project deliverables and, importantly, through the project it is intended that by using these tools with the stakeholders, the KM practices will be embedded within their organizations in the future.

200. In addition to the above the project will provide many opportunities for formal learning, awareness raisings and capacity building cut across almost all outputs and activities. These sets of measures will catalyze longer-term learning and short-term professional training/retraining programs targeting all stakeholders, including vulnerable communities, local governments, schools and universities and, relevant authorities.

201. All knowledge products, generated within the project including technical reports, methodological guidelines, regulatory and policy, planning and outreach materials will be available on-line, and all project knowledge products and documents will be collected and archived on e-library on multi-hazard disaster risk management.

202. The knowledge from structural and non-structural measures that will be implemented under outcome 3 will be captured and processed to achieve replicability and scalability of successful interventions. The project will develop the Drin basin Integrated FRM plan and will implement some of the structural and non-structural intervention measures in selected high priority areas. These will provide strong technology and knowledge transfer, as well as replicability impact as they will establish the methods, standards and approaches that will work across the Drin basin and other basin of the Riparian countries. The methods, standards, approaches will be defined in guidance, legal and policy documents. The potential for scaling up these approaches is therefore significant.

203. In addition, the AF project will provide critical climate risk information that would enable the Governments of Riparian countries to implement a number of basin-wide and nation-wide transformative policies for reducing exposure and vulnerability of the population, various sectors (e.g. agriculture, tourism, health and rural development sectors) and critical infrastructure (roads, bridges, electricity transmission lines, hydropower, other power facilities, water supply and sanitation systems) to climate-induced hazards. The project will thus c a paradigm shift in the climate-informed basin and national risk reduction and early warning approaches which will catalyse and scale up the use of climate-risk information and approaches across all sectors

I. Describe the consultative process, including the list of stakeholders consulted, undertaken during project / programme preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

204. At Concept development stage, stakeholder consultations in the four Riparians occured. Missions were conducted in each Riparian country to meet with key stakeholders. The aim of the missions was as follows:

1) To gain an understanding of the current status of the institutional frameworks and capacities for FRM in each country
2) To determine requirements within each country to strengthen FRM, particularly within the Drin Basin and identify national priorities
3) To gain an understanding of current regional/basin cooperation on FRM and identify areas for strengthening cooperation in line with the proposed project outcomes.
4) To identify and collect necessary data for the development of the project proposal
5) To understand previous and ongoing initiatives on FRM by institutions and partners, to ensure synergy and avoid duplication/overlap of effort
6) To identify potential co-financing

205. Furthermore, the project idea was presented to the Drin Core Group in June 2018 and the national delegations from the DCG countries supported the further development of the proposed project. Detailing the above, Annex 9 The Stakeholder Engagement Plan provides an overview of stakeholder consultations undertaken in each country including attendees and where available summary of key discussion points which informed the design of the project.

206. During full proposal development, the following consultations were held (please see Annex 9 for the records and reports on the below consultations):

1) Presentation of the Concept at the Drin Core Group meeting in November 2018

2) Mission to all Riparian countries by the UNDP Safeguards and Stakeholder Engagement Consultant.
3) Mission to Macedonia by Project Formulation lead which included Skype call with Drin Core Group
4) A series of consultations with GIZ to discuss coordination and synergy between the two projects and to ensure that any risk of overlap in the project design is avoided.
5) Field consultations with community beneficiaries in all three countries (at the proposed structural risk reduction sites).

J. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

207. The programme costs are additional to other costs associated with flood risk management activities carried out by the beneficiary countries and other parties. The proposal aims to build on existing platforms to meet the additional costs of adaptation. The project will fund the full costs of adaptation, such as policy and institutional frameworks, technology transfer, capacity development for promoting climate resilient transboundary flood risk management and demonstration of community-based low-cost flood risk reduction. The project is structured to allow a high proportion of funds to flow into capacity building, policy development and institutional activities associated with the promotion of climate resilient flood risk management.

208. As such, the components are expected to result in a significantly higher adaptation benefit than would otherwise be the case under a baseline scenario. A significant share of community vulnerability to climate-induced floods remains structural in nature and requires investment in a combination of structural and non-structural flood protection measures to build awareness of best practice and change behavior both among policy makers and agricultural communities. Further cost of adaptation reasoning is set out below.

Component 1 – Hazard and risk knowledge management tools

Without AF Intervention

209. The existing hydrometric network of the DRB is currently inadequate and in some cases, is owned and operated by disparate agencies/institutions (for example hydropower companies) and data collected is not centrally stored or accessible to the relevant institutions. In addition, not all data is available in electronic format.

210. Currently flood risk management in the Drin basin is being done without climate-risk informed flood hazard and risk maps for the basin, against which to identify risks, vulnerability and appropriate risk reduction, management and adaptation measures. This is due to a lack of experience of hazard, risk and vulnerability modelling and mapping and its application to climate risk-informed integrated Flood Risk Management approaches and points. There is a need for capacity building and financial resources, to enable the effective application of such approaches for adaptive flood risk management among the agencies responsible for flood management in the Riparian countries. Expertise in flood risk assessment using tools such as hydrological models is limited particularly within government organizations and there is limited knowledge of how to integrate climate change considerations into flood risk assessments.

211. Currently, flood management is missing the assessment of vulnerability and the use of appraisal methods to test the effectiveness of adaptation measures evaluate the cost-effectiveness of one measure against another and to prioritize measures. 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. This leads to inefficiencies, ineffectiveness and potential mal-adaptation.

With AF intervention

212. The project will optimize the hydrometric network for all required uses including strategic FRM monitoring, flood forecasting and early warning and procure and install new equipment. The project will also establish the institutional arrangements for operation and maintenance of the optimize network. To

ensure sustainability, the project will identify, and implement appropriate O&M financing mechanisms for the hydrometric network.

213. The project will implement an agreed unified basin approach to flood hazard modelling based on EUFD to undertake flood hazard, risk and vulnerability modelling and mapping to develop climate risk flood maps which will be suitable for use in land use planning, development zoning, flood risk mitigation design, establishment of flood insurance criteria, raising public awareness, and emergency planning across the whole basin. Climate information sharing platforms, protocols and dissemination mechanisms will be strengthened across member countries.

214. The project will develop and implement a GIS-based basin-wide socio-economic risk model to provide high-resolution vulnerability maps for the whole basin which will include damages losses, and loss of life estimates for floods of different return period. This will facilitate impact-based flood forecasting, cost-benefit analysis and the appraisal of FRM interventions based on cost-benefit analysis, and development of financing mechanisms for long-term FRM.

Component 2 – Transboundary FRM institutional, legislative and policy framework

Without AF Intervention

215. Institutional and legal framework for flood risk management in the Riparian countries of the DRB are highly fragmented in terms of competencies and suffer from overlapping/conflicting responsibilities of institutions. Mandates need to be clarified at national and sub-national levels, with clear assignment of responsibilities among institutions. Flood risk management in the Riparian countries of the DRB does not currently take a basin-wide strategic approach and as such the national legislative and policy frameworks and sectoral policies and plans do not currently incorporate such approaches, nor do they incorporate climate change considerations in the management of flood risks. Implementation of EU Floods Directive, which should catalyst a shift toward basin strategic flood risk management, is at different stages in each riparian country and national legislation is not yet fully aligned with the EU Acquis.

216. There is no integration of flood risk considerations into national sectoral policies and development programmes. Due to the fragmented nature of the legislative and institutional framework in each Riparian country, national sector policies are failing to adequately include flood risk and climate change considerations in their formulation and as a result, their current formulations perpetuate or exacerbate the risk of climate induced flooding and its consequences and will continue to do so if not addressed. A key example is the Hydropower sector which is important to all Riparian countries of the DRB[33], but which appears to be largely disconnected from the flood risk management both at the national and basin levels.

217. There are is no basin-level assessment of flood risk for the Drin basin and no comprehensive definitive flood hazard maps for the basin aligned with the EUFD. There is also no basin flood risk management strategy or plan addressing climate-induced flood risks. Flood risk management investment was not supported by robust climate-risk informed analysis, and there are no investment plans and no comprehensive financial risk transfer mechanisms to address flooding.

218. Weak NHMS are lacking the technical, resourcing and financial capacities to systematic monitor key hydrometeorological variables or generate essential climate risk data and information. There is limited sharing of data among institutions within and between countries and lack of coordinating mechanisms or protocols for such data sharing.

219. Formal coordination and cooperation among the Riparian countries on flood risk management is currently limited in the DRB. Coordination on water management has recently been strengthened through the Drin Coordinated Action which was established by the GEF-funded UNDP but it does not currently specifically address joint actions required for cooperation on flood risk management. The institutional set up which supports the Drin Coordinated Action has recently established an expert working group on floods, which will be key to basin coordination and cooperation on flood risk management. Under an MoU between

[33] See Annex 5

the national hydrometeorological institutions there is currently cooperation and data exchange for flood warning, based on regional forecasts, European Flood Awareness System (EFAS) and Flash Flood Guidance (SEE FFG). Currently coordination also includes existing bi-lateral agreements between pairs of Riparian countries, such as the newly signed agreement between Montenegro and Albania on water management, including flood management.

220. There is limited to no involvement of the private sector in climate risk financing, despite the large damages that have been and would be incurred to the private sector from flooding, and the significant commercial benefits that a functional integrated flood risk management system would provide to private sector. In addition, private sector (in particular hydropower, forestry and agriculture) has a role in flood risk management and therefore needs to engaged in its financing. Risk transfer mechanisms are not well developed and currently post-event compensation and reliance on external donor recovery funds, are the main approaches to dealing with the economic shocks of flooding disasters

221. At the river basin level, engagement of the hydropower sector has been undertaken by the Drin Core Group under the current GEF-funded project. In 2017, a meeting with ELEM and KESH[34] was facilitated by the Drin Core Group Secretariat and the support of the GEF Drin Project, primarily to discuss the possibility to establish enhanced cooperation in the fields of energy and water in the Drin Basin. The meeting discussed the basis, scope and content of cooperation, modalities of cooperation and level of participation, and assistance and support that could be provided by the Drin Coordinated Action through the Drin Core Group (DCG) and the GEF Drin Project for the advancement of cooperation. The aim of the establishment of this cooperation under the auspices of the Drin Core Group is to bring the energy sector to the forefront of enhanced management of the Drin Basin at transboundary level. In addition, the meeting discussed the participation of KESH and ELEM in the deliberations for the management of the Drin Basin at the transboundary level under the Drin Coordinated Action. The meeting concluded that ELEM and KESH will be engaged in a structured cooperation process on pre-defined areas to address identified needs and issues of common interest including exchange of hydrological and meteorological information and data, both historical and realtime, usage of hydrological models, and additional areas of cooperation may be identified by the companies over the course of time. A draft Memorandum of Understanding (MoU) that defines the modalities of and govern cooperation with KESH and ELEM was be drafted by the Drin Core Group Secretariat and is pending finalization. The MoU provides for other energy companies and/or energy regulatory authorities to be invited to participate. KESH and ELEM will appoint representatives in the Expert Working Group of the Drin Core Group named "Expert Working Group on Floods". Private sector engagement of this key sector has been established at the basin level but needs to be further strengthened in order to explore specific areas of cooperation on flood risk management, including private sector financing.

222. Country level private sector engagement is also established in the Riparian countries to differing degrees. In **Montenegro**, the national DRR strategy from 2017 incorporated principles of Sendai Framework where private sector is recognized as one of stakeholders to be more involved in these activities, but to date there is no concrete involvement due to the lack of mechanisms for engaging the private sector in DRM activities. The responsibility for O&M financing in the DRR sector includes the roles of private players and property owners for specific measures, however, core responsibilities lie within national and local authorities, including financing. In Macedonia, The Public Enterprise for Water Economy is responsible for maintenance of riverbeds and irrigation/drainage channels, CSOs, and Centre for Development of South-West Region. ELEM (Elektrani na Makedonija), the state company that manages the hydropower plants on the River Crn Drim, is one of the main business sector players in the Drin Basin. Given that the River Sateska was diverted into the Ohrid Lake a few decades ago to prevent eventual negative impact of the sediment to the operation of the hydro-power plans (HPP) on the River Crn Drim, ELEM provides funds annually to the Municipality of Struga to be used for environment protection, and to the Public Enterprise "Vodostopanstvo" (Water Economy enterprise) for maintenance of the riverbed of Crn Drim and Sateska. However, there is no formal mechanism for ensuring that these funds are spent on such activities. In Albania, private sector engagement in financing of O&M activities at the municipal level is through permits charged for private sector activities in the municipality. Parts of the funding from these permits goes towards operations and maintenance of flood risk management activities and

[34] See Annex 9 for meeting minutes.

infrastructure, but again there is no formal accounting for the targeted spending of such funds. In the course of the project development consultations with local private sector around the proposed pilot flood risk reduction sites have been conducted in FYRoM and Montenegro facilitated by the local municipalities.

With AF intervention

223. With AF funds, the current efforts at coordination and cooperation will be consolidated and extended through the establishment of a dedicated coordination mechanism on flood risk management with the necessary political support and resourcing from the Riparian countries to comprehensively address missing formalized and effective cooperation on FRM.

224. The AF project will work to develop a basin level coordination mechanism between various Riparian institutions and authorities in all areas of flood risk management and will provide a policy foundation for flood risk management at basin level, including the mechanisms and coordination lines. The project will also support integration of FRM into national sectoral policies and development programmes ranging from the local communities to the state level. Through the coordination platform, the project will facilitate a shift in focus flood risk reduction through policy actions and the development of a priority sector plan.

225. An aim of the project will be to engage the hydropower and other relevant private/productive sectors in flood risk management of the DRB. Key to this will be to include HPP companies in the basin Floods EWG. A long-term aim will be to fully include HPPs in FRM through agreement on operations of their systems during flood events. The project will therefore build upon and strengthen engagement of the HPP's already established under the Drin Core project and establish specific areas of cooperation on flood risk management, including private sector financing.

226. With regard to financing of the O&M for structural measures to be implemented in target municipalities for the AF project, in **Montenegro**, there has been expression of interest and willingness by private sector players from Ulcinj Municipality-where structural measure to be implemented, to participate in risk financing especially in overall maintenance, once the necessary risk financing mechanisms are put in place. In **Macedonia**, representatives of ELEM expressed interest to continue their support to the local governments in the region and to be even directly involved in the maintenance of the diversion structure in the village of Volino (the point where the River Sateska is diverged in its old riverbed whenever the water level in the Ohrid Lake is very high and there is a risk of flooding of the towns of Ohrid and Struga). ELEM is providing certain amount of funding for the cleaning of the riverbed of Crn Drim and they will continue to do it, but the company's management is interested in finding a more sustainable way of maintenance of the riverbed of Crn Drim and Sateska[35]. The ELEM, management expressed interest of and readiness for further cooperation (See Annex 9 for the minutes). The geodetic data will be shared that will be used for calculating the sediment in the urban/rural part of Crn Drim. It will also provide valuable information concerning hydraulic modeling, underground waters, flood risks and planning of priority clean up actions of the critical part of the rivers[36].

227. Another aim of the project will be to develop the basin policies for basin-wide climate responsive flood risk-informed flood risk management. This will include policies on land use and spatial planning (including flood zoning and development control), which will ensure that land use and development decisions within each Riparian country take account of basin-wide flood risks (using established basin flood management tools and procedures), flood protection measures identification, prioritization, co-design and co-financing (particularly important where cross-border measures are needed), hydrometric services cooperation (strengthening existing agreements as necessary) and joint monitoring, data sharing and exchange, cooperation on civil protection, the operation of flood control structures the role of private sector in flood risk management and flood risk financing.

Component 3 – Priority community-based climate change adaptation and FRM interventions

[35] See Annex 9 for MINUTES OF THE LOCAL STAKEHOLDER CONSULTATIONS - 19 December 2018, Struga

[36] Meeting with the General Manager of ELEM (Macedonian Power Plants) to discuss possible collaboration in the Drini River Basin, Annex 9.

Without AF Intervention (baseline)

228. The GIZ-funded project "Climate change adaptation in the Western Balkans" (2012-2018) has been providing advisory services and support to Albania, Kosovo, the Former Yugoslav Republic of Macedonia and Montenegro for enhanced flood and drought risk management in DRB focusing on five key areas: (i) establishing a regional flood EWS; (ii) drafting CC adaptation strategies; (iii) local flood and drought management plans; (iv) transboundary water resource management concepts; (v) integrating CCA into urban planning for Tirana, Podgorica and Belgrade. In Albania and Montenegro FRM plans have been drawn for 31 municipalities and local implementation capacities were enhanced. The rain and stream gauging networks have been extended for flood forecasting with 33 water level and rainfall stations rehabilitated and upgraded. A DRB hydrological model has been developed for all sub-basins and hydraulic models have been developed and included in the model. The Drin flood EWS is currently functioning and sits within the NHMS in each Riparian country, for generating national early warnings. Practitioners in all Riparian countries have received training on the EWS.

229. Without AF intervention, the Riparian countries of the DRB, will continue to be limited to expensive flood defenses as budgets allow. Such defenses will fail to address catchment management issues which are also contributing to and exacerbating flood risk and will not provide the long-term sustainability due to the likely need to build more defenses with increasing capital and maintenance costs.

With AF intervention

230. The project will support the further development of the existing FFEWS with complementary activities, to enhance the density of the observation network on which the forecasts rely. It will also digitize the historical data for priority existing stations not yet included in the FFEWS.

231. The project will identify, prioritise and undertake outline design of a series of structural and non-structural measures for future long-term investments such as the provision of flood storage, the provision of new embankments and walls, local land raising to elevate development areas above the extreme flood level, local improvements to channel capacity and stability, flow control structures, increased maintenance and improvements to channels for the long-term management of floods as part of the river basin FRM strategy.

232. The project will undertake detailed design and implementation of specific prioritized structural measures in three Riparian countries.

233. In addition to priority structural measures, the project will also implement non-structural measures to include hillslope and floodplain vegetation, reforestation and the use of seasonal cropping, agroforestry, the use of vegetative bundles to build flood defenses etc., floodplain agro-forestry systems. Flood risk management measures will promote the re-establishment of natural floodplain functionality including: floodplain reconnection; selective bed raising / riffle creation; wash lands/wetland creation; re-meandering straightened rivers; land and soil management activities to retain/delay surface flows; creation or re-instatement of a ditch network to promote infiltration (swales, interception ditches, etc.); In-channel vegetation management growth to maximize channel roughness. Income generating ecosystem-based adaptation and FRM measures (e.g. agro-forestry) will be implemented in priority areas throughout the basin.

234. The project will develop local government response capacity, training first and second responders for flood emergencies through drills and role play exercises. Training will be provided for communities on roles and responsibilities during flood emergency procedures. Community-based resilience and adaptation will be built using participatory methods of risk assessment and community resilience planning. Community-based response roles and responsibilities will be defined and training of local communities undertaken. Community-managed flood forums will be established.

235. Training will be undertaken in the operation and maintenance of non-structural measures to increase capacity of local communities in the maintenance of non-structural intervention measures, utilizing the project KM tools and strategies. Information dissemination to reach all beneficiaries will be established, awareness raising and education, and gender mainstreaming approaches established.

K. Describe how the sustainability of the project / programme outcomes has been taken into account when designing the project / programme.

236. Investment in **human resources and institutions**: the project is focused on developing the institutions that have skilled human resources, information, tools and technologies to effectively pursue their mandate in flood risk management. The project investments will improve availability of risk information and create effective response mechanisms. The establishment of methods and tools for developing basin flood risk management strategies and plans, the introduction of risk assessment methods, standards and tools within relevant institutions, backed by the definition of these in guidance, legal and policy documents, makes this project highly replicable in other basins within the Riparian countries. Regional cooperation and intended partnership with ongoing projects make this project highly complementary. As detailed above, this project plans to attract private sector involvement and investment in FRM.

237. **Investment in natural capital**: To achieve long-term resilience and safeguard investments and communities against climate induced flood disasters, functional and protected river basin eco-systems are essential. Creating stable and well-managed natural capital is an investment in long term sustainability of social and economic assets that the project will create in the face of climate change.

238. Operational and financial sustainability (**Operations and Maintenance**): In order to ensure sustainable O&M of the hydrological monitoring equipment and EWS, under the Outcome 1 the project will assess the institutional arrangements and capacity for the operation and maintenance of the hydrometric network and develop Institutional capacity development plan for hydrometric network O&M detailing manpower and financial requirements, and training needs, for the efficient O&M of all the stations in each Riparian country. The project will assess existing roles and responsibilities and the capacity of staff responsible for operating and maintaining the hydrometric network, establish mechanisms for population and maintenance of centralized basin hydrometric database and prepare an operational plan for the hydrometric network including transmission of data, data management, data analysis and reporting procedures. The maintenance plan will cover manpower, technical capacity, material and finance requirements. The project will also review existing financing of hydrometric network O&M in each riparian country, identify resourcing, and training needs as well as institutional arrangements for the management of the proposed new hydrometric network, and develop and implement O&M financing mechanisms for the hydrometric network. The operation & maintenance plan will also account for the maintenance of all structural measures built by the project, by the relevant local government authorities. Furthermore, Output 1.1 is aiming to develop the relevant long-term financing mechanisms and design and implement long-term sustainable programs for operations and maintenance of expanded observation system and will assist relevant institutions (HMIs) to produce climate/weather products that may bring about additional revenues for these agencies. The lack of budget allocation for operations and maintenance has been identified by all HMIs in the Riparian countries, as the main barrier to an effective hydrometeorological monitoring system for the basin and the project is aiming to address this.

239. The sustainability of structural and non-structural measures will be ensured through the project intervention in developing long-term financing mechanisms for the operation and maintenance of the interventions. The project will obtain commitment from local governments as well as relevant central government institutions to cover O&M costs of engineering structures to be built in their respective municipalities from their local budgets/transfers and/or from central government (co-financing letters will be obtained to that effect).

240. With regard to non-structural measures to be implemented at the community level, local contribution (either in-kind, for example through locally organised and financed maintenance, or cash e.g. through payment of maintenance fees) will be leveraged from target communities to implement on-the-ground activities and to gain greater ownership from their side. In addition, significant capacity development and awareness raising programmes will be designed and implemented in target communities that will ensure the institutional sustainability of results to be achieved at community level (Output 3.3).

241. The project will help all relevant authorities develop and implement a comprehensive short to long-term learning and training programs at all levels including community, municipality and state levels. All these programmes will be integrated in existing education and training systems where possible and will be regularly applied after the end of the project. The system-level sustainability of institutional capacities created will be ensured by the development and adoption of relevant legal-regulatory and policy/planning frameworks as well as standards, protocols and guidelines for all aspects of flood risk management that the project is developing. The methods, standards, approaches will be defined in guidance, legal and policy documents. The potential for scaling up these approaches is therefore significant.

242. Common support, understanding and effective cooperation of various players will be achieved by establishing the coordinating platform, where issues of various project components will be discussed and solved by the consent of all parties. Furthermore, planning processes at regional, municipal and community levels will apply a participatory approach, where key stakeholders will be engaged from the beginning to the end of each process.

L. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

243. The project envisages implementation of small scale structural and non-structural flood protection measures. The project is expected to have moderate environmental and social impacts, as described in detail in the project SESP (Annex 6). Based on the scope, severity and number of potential risks, the project is considered Category B, and mitigation/management measures have been proposed for each of the identified project risks.

244. In reference to project activities, the direct environmental and social risks associated with capacity building or training activities are minimal although there is a risk of gender bias in training due to a lack of access, gender equity and women empowerment in training provided. To mitigate this and other gender risks, a Gender Assessment and Action Plan was prepared which proposes additional analysis of the Gender context (e.g. the collections of gender –disaggregated data), as well as other gender mainstreaming actions (tailoring capacity building and training activities, and making the EWS gender-sensitive by ensure equitable knowledge dissemination). Furthermore a Gender Expert will be employed during project developed and implementation to design and embed gender sensitive participatory approaches. Legislative support, particularly the introduction of basin zoning policies, has a small risk of restricting access to certain types of land use in the high-risk areas. The non-structural interventions combined with expansion of existing hydrometeorological network are unlikely to have medium risk impacts. The project will ensure that all the equipment purchased meets international environmental, safety and technical standards.

245. Other adverse environmental impacts relate to investments in small-scale structural flood protection measures under the Outcome 3. These have been subject to environmental safeguards review during the full project development phase and all related risks and mitigation measures and presented in the project SESP (Annex 6). The moderate environmental and social impacts are likely only as a result of the structural interventions, all structural intervention considered in the concept phase, or proposed that have highly significant adverse impacts (such as creation of channels which may impact basin hydrology and ecology in unpredictable ways) have been eliminated. Some dredging activities have been allowed, in areas of excessive sediment deposit, identified through hydraulic modelling. All activities such as dredging, are subject to an Environmental and Social Impact Assessment, which will ensure that that dredging activities take into account bio-physical characteristics of the river, including avoiding areas critical for fish spawning, and will be subject to a construction management plan, to mitigate the impacts of any heavy machinery. The activities related to Environmental Assessment and Management have been included in the project budget. Furthermore, an Environmental and Social Safeguards expert will provide additional backstopping to country teams during the implementation of all structural activities. The non-structural community resilience measures, including agroforestry and floodplain/watershed restoration will have limited environmental and social impact, but regardless have been designed in a way to maximize environmental co-benefits (the planting of diverse native tree species and regulatory support to local governments on deforestation). The project will carefully assess and select plant species during the design phase in terms

of their conservation and economic values that are of local provenance and have high survival rate, etc. Overall, community resilience measures will create temporary jobs for local community members, including women that can be considered as a short-term positive social impact.

246. The construction of some structural interventions will require the use of heavy machinery. These activities may create such environmental and social impacts which may result in deleterious short term and spatially restricted impacts including dust, traffic and noise, pollution of land, water and air from vehicle exhausts, used oils, excavated soil, river bank and bed erosion and spatially limited degradation of floodplain vegetation and landscapes. Structural measures of a certain scale will be subject to Environmental and Social Impact Assessment according to national laws, that will include measures that will be implement to control adverse impacts, such as sediment control and monitoring plans, and flora and fauna monitoring plans. The ESMPs developed as part of the ESIA as required will also require the contractors to undertake all activities and adhere to environmentally sound site management practices, by planning and implementing activities in a way to reduce traffic, keep strongly the site boundaries/limits, not carry out earth and construction works during rainy days, install soil erosion control structures (embankments, collectors, etc.). Further, where necessary site rehabilitation measures will be implemented, including re-vegetation at some sites after completion of construction works. Necessary measures have to be taken to avoid over-surface runoff and drainage of soil and turbid water into natural water bodies by stabilizing the soil piles and by avoiding construction works during rainy days. Major wastes that would be generated during construction phase would be unused soil and leftover concrete and boulder. Where possible, this material should have a beneficial reuse option, including using good material for agricultural purposes. Where this is not possible, any materials should be disposed on specially allocated land plots, pre-agreed with local authorities or could be distributed among local farmers for various beneficial uses.

247. Negative social impacts during construction phase may arise from work place injuries as well as during transporting construction materials or construction crew. Traffic and workplace safety precautions should be taken by construction crew, including all construction staff wearing PPE and complying with national laws, technical norms and standard while dealing with machinery and equipment. The necessary ESMPs, depending on the design of the final structural measures, will envisage for crews to always have the medical kits on-site as well as to assign wardens among them in order to contact relevant rescue and medical teams in case of emergencies. The project will avoid all physical and economic displacement.

248. During construction phase temporary jobs for locals can be created as a short-term positive impact. However, the long-term sustainable positive social and environmental impacts of the project and in particular, flood defense structures will be avoided losses in human lives, assets, agricultural lands and ecosystems.

249. A grievance redress mechanism will be set up for the project according to the UNDP and AF safeguards policies. In case stakeholder concerns and complaints are detected during monitoring/inspection visits or otherwise communicated to the project or project partners, these concerns should be addressed properly in a writing form within to the grievance redress mechanism.

250. Detailed screening of environmental and social impacts and risks has been provided as part of the SESP (Annex 6)

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law		V*
Access and Equity	V	
Marginalized and Vulnerable Groups		V
Human Rights	V	
Gender Equity and Women's Empowerment		V

Core Labour Rights	V	
Indigenous Peoples	V	
Involuntary Resettlement	V	
Protection of Natural Habitats		V
Conservation of Biological Diversity		V
Climate Change		V
Pollution Prevention and Resource Efficiency		V
Public Health	V	
Physical and Cultural Heritage	V	
Lands and Soil Conservation		V

** Structural measures are subject to National ESIA regulations as per the final design specifications*

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme management at the regional and national level, including coordination arrangements within countries and among them. Describe how the potential to partner with national institutions, and when possible, national implementing entities (NIEs), has been considered, and included in the management arrangements.

251. At the request of the Governments of Albania, the former Yugoslav Republic of Macedonia and Montenegro, UNDP is the Multilateral Implementing Entity (MIE). As a Multilateral Implementing Entity, UNDP is responsible for providing a number of key oversight and specialized technical support services. These services are provided through UNDP's global network of country, regional and headquarters offices and units and include assistance in: project formulation and appraisal; determination of execution modality and local capacity assessment; briefing and de-briefing of staff and consultants; general oversight and monitoring, including participation in reviews; receipt, allocation and reporting to the donor of financial resources; thematic and technical backstopping; provision of systems, IT infrastructure, branding, and knowledge transfer; research and development; participation in policy negotiations; policy advisory services; programme identification and development; identifying, accessing, combining and sequencing financing; troubleshooting; identification and consolidation of learning; and training and capacity building.

252. As outlined in UNDP's application to the Adaptation Fund Board for accreditation as a Multilateral Implementing Entity, UNDP employs a number of execution modalities determined on country demand, the specificities of an intervention, and a country context. The project will be executed by the **UNDP Istanbul Regional Hub (IRH)** under the UNDP Direct Implementation Modality (DIM) in line with UNDP's Programme and Operations Policies and Procedures and IRH Standard Operating Procedures for Regional Programme Management. UNDP Istanbul Regional Hub will be responsible for overall management, ensuring project coherence, the preparation and implementation of work plans and annual audit plans; preparation and operation of budgets and budget revisions; disbursement and administration of funds; recruitment of national and international consultants and personnel; financial and progress reporting; and monitoring and evaluation.

253. For the delivery of specific regional activities the IRH will engage the **Global Water Partnership – Mediterranean (GWP-Med) as a Responsible Party** for the Project. GWP-Med is the Mediterranean Regional Water Partnership of the inter-governmental organisation Global Water Partnership. GWP-Med is the Executing Agency of the UNDP/GEF regional project "Enabling transboundary cooperation and integrated water resources management in the extended Drin River Basin". GWP-Med also serves as a Secretariat of the Drin Core Group (DCG). In the capacity of the Responsible Party of the UNDP/AF project, the GWP-Med will implement specific regional activities of the project and will also provide links with the GEF-funded transboundary project in the Drin River basin as well as the potential SAP implementation activities in the basin. UNDP Albania CO already serves as the Principal project Representative for the GEF Transboundary Drini Project and has an ongoing Project Cooperation Agreement with GWP. National/country-based activities under the Adaptation Fund project will be delivered through the UNDP Country Offices in beneficiary countries (Albania, the former Yugoslav Republic of Macedonia and Montenegro).

254. A **Regional Project Board (RPB)** or the **Regional Steering Committee (RSC)** will serve as the project's coordination and decision-making body. The existing **Drin Core Group (DCG)** will serve as the Regional Steering Committee of the Adaptation Fund project. The DCG is a body with the mandate to coordinate actions for the implementation of the Shared Vision for the sustainable management of the Drin Basin and the related Memorandum of Understanding (MOU) signed by the ministries of the water and environment management of the Drin Riparians. In its capacity of the RSC of the Adaptation Fund project the DCG will ensure synergy of the AF-funded interventions with a broader sustainable transboundary water management work in the Drin River Basin, including implementation of the on-going GEF-funded project and potential follow-up initiatives to implement the DRB SAP. In addition, the

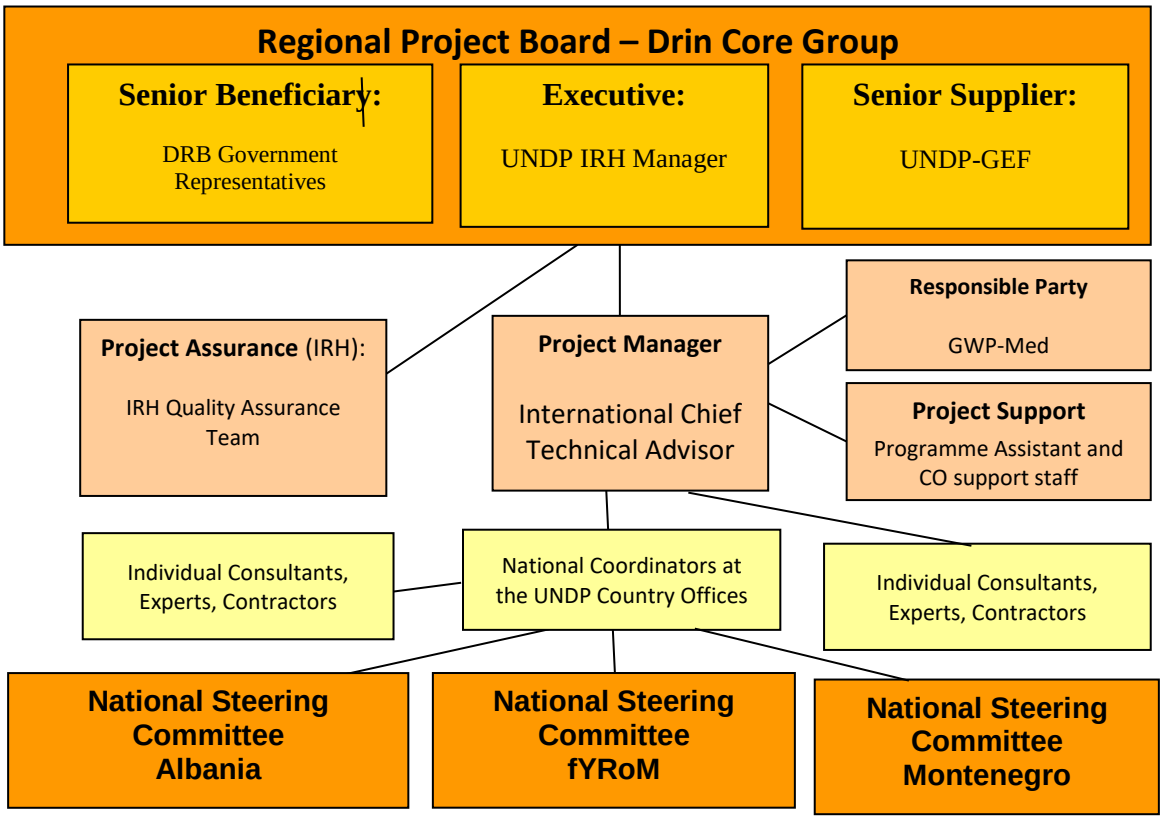
RPB is responsible for ensuring that the project remains on course to deliver products of the required quality to meet the outcomes defined. The RPB's role will include: (i) providing overall leadership, guidance and direction in successful delivery of outputs and their contribution to outcomes under the regional programme, ensuring the project remains within any specified constraints; (ii) overseeing project implementation; (iii) approving all work plans and budgets, at the proposal of the Project Manager (PM), for submission to UNDP-GEF; (iv) approving any major changes in plans or programmes; (v) reviewing annual progress reports and end project report; (vi) ensuring commitment of resources to support implementation; (vii) arbitrating any conflicts within the project and/or negotiating solutions between the project and any other stakeholders. The DCG will also be the focal point for data sharing and dissemination through its existing transboundary coordination functions and links with the national structures. IRH Senior Manager will represent UNDP in the RPB. RSC will meet according to necessity, but not less than once in 12 months, to review progress, approve work plans and approve major deliverables.

255. The **National Project Boards or Steering Committees** in the three beneficiary countries will be established to oversee and guide project implementation at the country level, including implementation of structural and non-structural flood risk management measures. The national Steering Committees will be composed of the national project stakeholders and will be co-chaired by UNDP Country Offices. At the national level, UNDP Country Offices will be the link to National Hydrometeorological Services (NMHSs) and other national and local institutions in charge for FRM, and will provide technical assistance to disseminate the programme results towards the related Ministries in charge of flood risk management. The NMHSs and other national FRM entities and stakeholders will be part of national steering committees. The network of GWP country partners (NGOs, CBOs etc.) will be engaged to disseminate and mainstream the programme results at local level.

256. **Project Assurance:** UNDP IRH and UNDP Country Offices will support project implementation by assisting in monitoring project budgets and expenditures, recruiting and contracting project personnel and consultant services, subcontracting and procuring equipment. UNDP IRH will also monitor the project implementation and achievement of the project outcomes/outputs and ensure the efficient use of donor funds through an assigned UNDP Project Manager. UNDP will act as the Senior Supplier and Project Assurance.

257. **Mechanisms for local participation:** the project will use the existing locally established mechanisms for local consultation and participation.

Project Structure



258. The day-to-day administration will be carried out by a Regional Project Manager (PM) and Project Assistant (PA). The staff will be recruited using standard UNDP recruitment procedures. Regional **Project Manager (PM)** will be an international professional designated for the duration of the project. The PM's prime responsibility will be to ensure that the project produces the results specified in the project document to the required standard of quality and within the specified constraints of time and cost. The PM will, with the support of the PA, manage the implementation of all activities, including: preparation/updates of work and budget plans, record keeping, accounting and reporting; drafting of terms of reference, technical specifications and other documents as necessary; identification, proposal of consultants to be approved by the RPB, coordination and supervision of consultants and suppliers; organization of duty travel, seminars, public outreach activities and other events; and maintaining working contacts with partners at the central and local levels. The PM is accountable to UNDP and the RPB for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. The PM will produce Annual Work and Budget Plans. The PM will further produce quarterly operational reports and Project Performance Reports (PPR). These reports will summarize the progress made versus the expected results, explain any significant variances, detail the necessary adjustments and be the main reporting mechanism for monitoring activities. The PM will be technically supported by contracted national and international service providers, based on need as determined by the PM. Recruitment of specialist services will be done in accordance with UNDP's rules and regulations.

259. The PM will be supported by an **International Chief Technical Advisor (CTA**, part time) recruited by UNDP for this project. CTA will provide (i) state of the art technical advice and (ii) associated policy advise to the programme and its activities. S/he will provide guidance and advice to the Regional Programme Manager and National Coordinators on identifying the best methods to ensure that the project achieves maximum impact, in accordance with European and international

best practice, towards its adaptation objectives. In addition, the project will rely for technical advisory support and guidance on the DCG **Expert Working Group on Floods.**

260. The **UNDP Country Offices (COs)** will implement in-country activities as per agreed workplans. IRH will ensure financial allocations to Country Offices as per established workplans / activities for each of the country. The assigned CO staff will support the project implementation, monitoring, and contribute to the financial and operational closure and final reporting. National Coordination Teams will be established at each beneficiary country hosted by the UNDP Country Offices and will be staffed by **National Coordinators** and project Finance/Administrative Assistance (part time). The National Coordinators will be coordinating all project activities at the national level, including: (i) selection, contracting and supervising teams of national consultants who will be implementing specific project activities in the country; (ii) identification and engagement of key stakeholders in the country and arranging regular consultations with them; (iii) keeping track of the financial status of the activities and allocations at all times, to control expenses, to handle outstanding commitments, to make payments and to monitor the performance of contractors; (iv) organizing and supporting national Steering Committee meetings and national stakeholder consultation workshops and events; (v) ensuring regular communication and coordination with the national government counterparts; (vi) overall project management at the national level and reporting to the UNDP IRH.

261. UNDP will provide Direct Project Services (DPS). DPS costs are those incurred by UNDP for the provision of services that are execution driven and can be traced in full to the delivery of project inputs. Direct Project Services are over and above the project cycle management services. They relate to operational and administrative support activities carried out by UNDP. DPS include the provision of the following estimated services: i) Payments, disbursements and other financial transactions; ii) Recruitment of staff, project personnel, and consultants; iii) Procurement of services and equipment, including disposal; iv) Organization of training activities, conferences, and workshops, including fellowships; v) Travel authorization, visa requests, ticketing, and travel arrangements; vi) Shipment, custom clearance, vehicle registration, and accreditation. These service costs are assigned as Project Management Cost, identified in the project budget as Direct Project Costs. Eligible Direct Project Costs should not be charged as a flat percentage. They should be calculated on the basis of estimated actual or transaction based costs and should be charged to the direct project costs account codes: "64397 – 'Services to projects - CO staff' and 74596 – 'Services to projects - GOE for CO'. UNDP recognizes that these services are not mandatory and will only be provided in full compliance with the UNDP recovery of direct costs policies. The DPS will be charged annually using the UNDP Universal Price List.

B. Describe the measures for financial and project / programme risk management.

262. The following table summarizes the preliminary risks identified through the initial consultative process. During the development of the project proposal and subsequent project document, the risks will be further analyzed and included in a Project Risk Log.

Risk	Level	Mitigation Strategy
Government change and/or administrative reforms in the beneficiary countries result in changing priorities that are not fully aligned with the expected results of the project	Medium	The project objective is in line with the intergovernmental cooperation goals under the Drin MOU and will be pursued by the DCG. The project has strong work components at community level. Regardless of government change and the priorities set at national level, the community focus will be maintained. Component 2 of the project will also be aligned with the National Adaptation Planning to ensure that project results are integrated in the government planning and policy frames for longer term implementation and monitoring. The project will have constant consultations with high-level government representatives and will carry out lobbying and advocacy campaigns

Risk	Level	Mitigation Strategy
		in support of CC adaptation, EWS and DRR. This will reduce the impact of the risk to the minimum level.
Unexpectedly strong extreme climatic events threaten/destroy hydrometeorological and/or flood defense infrastructure	High	Research and monitoring will facilitate a greater understanding of the causes of the impacts of these threats, facilitating an improvement in the action plans to adapt to them. The project will develop and implement emergency management/contingency plan in line with UNDP requirements. During the design and constructing of relevant infrastructure disaster risks will be taken into consideration or in other words, climate proofing will be carried out. These activities will reduce the level of impact and probability that the infrastructure will be destroyed to minimum level. The location for the hydrometeorological observation equipment will also be defined taking into account the assessment of disaster and climate risks.
Absorption and operational capacities of national project beneficiaries stay inadequate to properly run and maintain modeling, forecasting and EWS	Medium	The project will pay high attention to the capacity building of all relevant agencies through carrying out training of trainers, on-the-job and field trainings of the staff of relevant agencies, introducing/strengthening internship mechanisms within beneficiaries, developing technical guidelines, methodologies and sustainable operations and maintenance plans for established the modeling, forecasting and EWS. Altogether will reduce probability and impact of the risk to minimum level.
Changes and turn over in government staff	Medium	The project, through its component 2, will work on knowledge management and ensuring the establishment of systematic institutional memory of the Project at the short and long term, so that the new government staff can continue building on this information.
Local communities are not interested to be engaged in community-based flood risk reduction measures and EWS	Low	The risk is overall low. The project will conduct awareness campaign at grassroots' level on the climate-induced natural hazards, vulnerabilities and risks and benefits for reducing these risks. It will also make significant efforts to mobilize and empower local communities.
No finances are available for proper operation and maintenance of the upgraded hydrometeorological network, EWS and flood protection structures	Medium	The project will assess the institutional arrangements and capacity for the operation and maintenance of the hydrometric network and develop Institutional capacity development plan for hydrometric network O&M detailing manpower and financial requirements, and training needs, for the efficient O&M of all the stations in each Riparian country. The project will assess existing roles and responsibilities and the capacity of staff responsible for operating and maintaining the hydrometric network, establish mechanisms for population and maintenance of centralized basin hydrometric database and prepare an operational plan for the hydrometric network including transmission of data, data management, data analysis and reporting procedures. The maintenance plan will cover manpower, technical capacity, material and finance requirements. The project will also review existing financing of hydrometric network O&M in each riparian country, identify resourcing, and training needs as well as institutional arrangements for the management of the proposed new hydrometric network, and develop and implement O&M financing mechanisms for the hydrometric network.
Failure to engage the private sector in financing mechanisms	Medium/ High	The project will undertake willingness-to-pay surveys during Inception phase and will gauge feasibility of this approach early on. The project is developing other risk financing mechanisms of which private sector is envisaged to be a part, hence failure to engage private sector will shift focus to other mechanisms

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

263. During the preparation of the Full Project Proposal, all relevant issues related to environmental and social risks were identified, through the application of the UNDP Social and Environmental Safeguards Procedure (SESP) which meets the Adaptation Fund's Social and Environmental Policy and provides recommendations made for appropriate action for the project implementation stage. The Social and Environment Screening Report (Annex 6) and the environmental and social risk management plan (Annex 7) have been developed and provided in conjunction with the stakeholder engagement plan (Annex 9) and the gender assessment and action plan (Annex 8).

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

264. Project monitoring and evaluation (M&E) will be in accordance with established UNDP procedures and will be carried out by the Project team and verified by UNDP IRH and Country Offices in three beneficiary countries. Dedicated support by the technical adaptation teams in the UNDP Istanbul Regional Hub and UNDP-GEF New York will be provided on a regular basis.

265. A comprehensive Results Framework for the project will define execution indicators for project implementation as well as the respective means of verification. A Monitoring and Evaluation system for the project will be established based on these indicators and means of verification.

266. Targeted M&E activities for the proposed project include the following:

- A Project Inception Workshop will be conducted within two months of project start up with the full project team, relevant government counterparts and UNDP. The Inception Workshop is crucial to building ownership for the project results and plan the first-year annual work plan. A fundamental objective of the Inception Workshop will be to present the modalities of project implementation and execution, document mutual agreement for the proposed executive arrangements amongst stakeholders and assist the project team to understand and take ownership of the project's goals and objectives.
- Another key objective of the Inception Workshop is to introduce the project team which will support the project during its implementation. An Inception Report will be prepared and shared with participants to formalize various agreements decided during the meeting.
- A UNDP risk log will be regularly updated in intervals of no less than every six months in which critical risks to the project have been identified.
- Quarterly Progress Reports will be prepared by the Project team and verified by the Project Board.
- Project Performance Reports (PPR) will be prepared to monitor progress made since project start and for the previous reporting period. These annual reports include, but are not limited to, reporting on the following:
    - Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative);
    - Project outputs delivered per project Outcome (annual);
    - Lessons learned/good practices;
    - Annual expenditure reports;
- Reporting on project risk management.
- Government authorities, members of Steering Committee/Project Board and UNDP staff will conduct regular field visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress.

267. The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation, which will determine progress being made toward the achievement of outcomes and identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term.

268. Final External Evaluation will be conducted no later than 3 months before project closure.

269. The budgeted Monitoring & Evaluation plan is as follows:

Type of M&E activity	**Responsible Parties**	**Budget US$**	**Timeframe**
Inception workshop	Project Coordinator UNDP CO	$10,000	Within first three months of project start up
Inception Report	Project team UNDP CO	None	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	Project Coordinator	None	State, mid and end of project
Annual measurement of indicators	Project Coordinator	None	Annual prior to annual reports and the definition of annual work plans
Monthly/quarterly reports	Project team	None	End of each month
Annual reports	Project team UNDP IRH, COs, RP	$5000 (total amount for all years)	End of each year
Meetings of project Regional Steering Committee and National Steering Committees	Project Coordinator UNDP-IRH, COs	$40,000	After inception workshop and thereafter at least once a year
Technical reports	Project team External consultants	None	To be determined by Project Team and UNDP CO
Mid-term external evaluation	Project team UNDP CO External consultants	$35,000	Mid-point of project implementation
Final external evaluation	Project team UNDP CO External Consultants	$35,000	End of project implementation
Final report	Project team UNDP CO	None	At least one month before end of project
Publication of lessons learned	Project team	$15,000 ($3,000 per year)	Yearly
Audit	UNDP IRH, COs Project team	$35,000 ($7,000 per year)	Yearly
Visits to field sites	UNDP IRH, COs Project team	$35,000 ($7,000 per year)	Yearly
Total indicative Cost		**$210,000**	

NB: Above costs do not cover UNDP staff time. All UNDP staff costs associated with M&E are covered by the MIE Fee. The M&E budget will integrated in the three project component budgets.

E. Include a results framework for the project / programme proposal, including milestones, targets and indicators.

Objective: To assist the riparian countries in the implementation of an integrated climate-resilient river basin flood risk management approach in order to improve their existing capacity to manage flood risk at regional, national and local levels and to enhance resilience of vulnerable communities in the DRB to climate-induced floods.					
	Indicators	**Baseline**	**Targets** **Project completion**	**Means of verification**	**Risks and assumptions**
Objective of the Project **To assist the riparian countries in the implementation of an integrated climate-resilient river basin flood risk management approach in order to improve their existing capacity to manage flood risk at regional, national and local levels and to enhance resilience of vulnerable communities in the DRB to climate-induced floods**	Total Number of direct and indirect beneficiaries with reduced vulnerability to flood risks; Number of beneficiaries relative to total population	0	Direct beneficiaries: 190,000 people (XX% women TBD) / 12% of the DRB population Indirect beneficiaries: 1.6 million people living in DRB (XX% women TBD)	Census data Baseline and periodic vulnerability assessments and surveys Risk and vulnerability database Project mid-term and final evaluations	Capacities created at relevant agencies through the project are maintained and periodically renewed Political will to implement relevant legal-regulatory reform for effective and efficient FRM at national and transboundary level Enhanced hydrometeorological observation network results in enhanced generation and delivery of early warnings and response actions of communities at risk Coordination mechanisms have relevant representation, participation in the coordination
	Availability of high quality flood hazard and risk information generated and disseminated to stakeholders on a timely basis	Gaps in observation and flood risk information hamper effective flood forecasting and EWS, development of basin-level integrated CCA and FRM strategy and plan and climate resilient sectoral planning.	Enhanced food hazard and risk information for DRB is available and used for: (a) enhanced FFEWS (in cooperation with GIZ) (b) Climate-informed Drin River Basin Integrated CCA and FRM Strategy and Plan and implementation capacities are in place (c) Sectoral planning	Regional and national climate change and FRM/DRR policies, plans and reporting at the national, district and community levels; Project Reports; Midterm and Final Evaluations	

	Number and level[37] (where relevant) of effective coordination mechanisms for climate-resilient FRM in DRB	1 coordination mechanism: Drin Core Group/MOU: Level 3 The Drin Coordinated Action was established to promote joint action for the coordinated integrated management of the shared water resources in the basin. The MoU does not currently specifically address joint actions required for cooperation on flood risk management. The existing coordination and bilateral agreements are insufficient for a truly transboundary river basin approach to flood risk management.	4 coordination mechanisms: (a) DCG/MOU: Level 4 (b) Drin Floods Working Group: Level 4 (c) DRB Framework Agreement on FRM (d) DRB SAP is informed of climate-induced flood risks and integrated resilient FRM measures	Minutes of the meetings of coordination mechanisms Project annual reports; Mid-term evaluation, final report.	mechanisms are at the appropriate decision making level, the coordination mechanism meets with sufficient periodicity and consistently, the mechanism coordinates appropriate information flows and the mechanism monitors action on items/issues raised Effective cooperation and coordination with GIZ project on the implementation and enhancement of the FFEWS. GIZ project delivers its planned outcomes. Structural and non-structural measures met their design standards in reducing the risks to populations and reduction in agricultural land losses Target communities understand shorter-

[37] Level 1 = no coordination mechanism; Level 2= coordination mechanism in place; Level 3 = coordination mechanism in place, meeting regularly with appropriate representation (gender and decision-making authorities); Level 4 = coordination mechanism in place, meeting regularly, with appropriate representation, with appropriate information flows and monitoring of action items/issues raised.

					to-longer-term benefits of CRM and risk reduction interventions and engage on a voluntary basis in operations and maintenance of such systems
Outcome 1 Improved climate and risk informed decision-making, availability and use of climate risk information	**Indicator 1.1:** a) Coverage and effectiveness of the hydrometric monitoring networks in riparian countries. b) Number of new observation stations installed	Significant gaps in the coverage (especially in FYR Macedonia and Montenegro) and inefficiencies in data management, operations and maintenances of the hydrometric monitoring network across DRB prevents adequate forecasting and early	**Indicator target 1.1.** a) Enhanced coverage and efficiency of the hydrometric monitoring network in DRB and improved O&M provides for improved FFEWS and FRM decisions across DRB. b) Target number of new stations to be defined during Year1 of the project based on the network design.	Inventory of the new hydrometric monitoring equipment in riparian countries installed by the project (NHMSs) Reports on the operations of the FFEWS (GIZ project)	Government commitments to secure adequate O/M of monitoring equipment, relevant software and databases are fulfilled on a continuous basis both during the project implementation and afterwards

	Indicator 1.2: Level of introduction of modelling tools and technologies for the strategic flood risk assessment and flood hazard mapping	warning and efficient decision making on FRM. An integrated basin wide hydrological and hydraulic model for the DRB is absent. Under the new GIZ project detailed flood modelling and mapping is planned for the Lake Shkoder/Skadar and Bojana-Buna area. Lack of socio-economic data for risk, damages, losses, exposure and vulnerability assessments.	**Indicator target 1.2.** Enhanced modelling tools and technologies for the strategic flood risk assessment in DRB based on EUFD, including: a) Spatial Data Initiative[38] and data management system; b) Detailed topographic surveys and data for the Crn Drim in Macedonia. c) Detailed hydrological and hydraulic modelling for the Crn Drim in Macedonia and high resolution flood hazard inundation maps d) Numerical high-level basin-wide hydrological and hydraulic models of the DRB integrating detailed area-based modeling developed under AF, GIZ and national projects.	DRB integrated hydrological and hydraulic models Project annual reports; Mid-term evaluation, final report.	Capacities built across relevant agencies through the project are maintained and periodically updated Relevant government agencies cooperate on and allocate resources for the implementation of the data management Unified modeling methodologies, developed with the Project support and with GIZ project, are endorsed and used for mapping; Necessary data sets for developing hazard maps and risk models are available Effective cooperation and coordination with GIZ project on the implementation and enhancement of the FFEWS Governments allocate necessary human and technical resources to conduct vulnerability assessment;
	Indicator 1.3. Level of implementation of the systematic gender-sensitive socio-economic vulnerability assessment in the DRB		**Indicator target 1.3.** (a) Socio-economic data collection tool developed and embedded at local and central institutionsl to systematically collect damages and losses data. Bespoke GIS-based socio-econpmic modelling tool develeped and introduced. (b) Baseline, progress and final report on social and gender vulnerability. At least 30% participants of consultations are women.	Reports of the socio-economic surveys Evaluation of the socio-economic risk model Project annual reports; Mid-term evaluation, final report.	

[38] A data repository which will provide a structured environment to enforce data integrity and support data auditing, versioning and data quality. Audit trails, as well as structured and categorized schemas, will make data collation, manipulation and analysis more manageable throughout the project

			(c) Systematic recording of flood damage and losses in DisInventar database		Decision-makers at selected state agencies use assessment data in prioritizing resilience measures in high-risk areas
Outcome 2 Improved institutional arrangements, legislative and policy framework for climate-resilient FRM, and development of CCA and FRM strategy and plans at the basin, sub-basin, national and sub-national levels	**Indicator 2.1:** State of the Drin River Basin FRM Policy Framework and cooperation on flood risk management	Limited basin-level coordination and cooperation on flood risk management. Under an MoU between the national hydromet institutions there is cooperation and data exchange for flood warning, based on regional forecasts, EFAS and SEE FFG. The Drin Coordinated Action was established to promote joint action for the coordinated integrated management of the shared water resources in the basin. The MoU does not currently specifically address joint actions required for cooperation on flood risk management.	**Indicator target 2.1.** (a) FRM policies designed in line with relevant EU directives. (b) Basin risk transfer mechanisms designed, including risk financing and risk transfer strategy, private sector engagement strategy, feasibility studies for identified and shortlisted risk financing mechanisms. (c) Sector FRM policies (at least 2 – energy, agriculture) based on modelling of climate change impacts on the identified sectors and on the detailed methodologies for incorporating climate-change responsive flood risk considerations into risk assessments, strategies, policies and plans for the energy and agriculture sectors.	Project annual reports; Mid-term evaluation, final report;	Riparian governments have political will to implement relevant legal-regulatory reform for effective and efficient FRM framework in line with EUFD DCG maintain adequate mandate and authority to spearhead resilient FRM policies and strategies across the sub-region Private sector is interested and is engaging in developing risk transfer and risk reduction mechanisms

	Indicator 2.2. **a)** % increase in institutional capacity to promote integrated climate resilient flood risk management b) Number of staff from targeted institutions trained to respond to impacts of climate-related events	Institutional capacities at the regional, national and sub-national level across the basin are insufficient to secure climate-resilient FRM. The existing coordination and bilateral agreements are insufficient for a truly transboundary river basin approach to flood risk management. What is missing is a basin-level integrated climate change adaptation and flood risk management strategy and plan and a multi-lateral Framework Agreement for the DRB in the field of flood risk management which establishes the institutional and legal basis for cooperation.	**Indicator target 2.2.** a) 50% increase in institutional capacity (measured through an institutional capacity assessment scorecard) b) At least 50 officials and other key national/regional stakeholders trained on improving the enabling environment (minimum 30% women)	Institutional capacity assessment scorecard Capacity review Training test results Project annual reports; Mid-term evaluation, final report; Partner reporting and audit.	Beneficiary and partner institutions are willing to cooperate and conduct regulatory and institutional reform Capacities created at relevant agencies through the project are maintained and periodically renewed
	Indicator 2.3. State of Drin River Basin Integrated CCA and FRM Strategy		**Indicator target 2.3.** Drin River Basin Integrated CCA and FRM Strategy and Plan developed and endorsed by regional and national stakeholders; Implementation started.	Review of the Drin River Basin Integrated CCA and FRM Strategy Minutes of the DCG meetings Project annual reports; Mid-term evaluation, final report	
Outcome 3 Strengthened community resilience through improved flood management, through implementation of structural and non-structural measures and enhanced local capacity for CCA and FRM	**Indicator 3.1:** State of climate-responsive design of structural and non-structural measures for long-term FRM investment in DRB.	Communities of the DRB remain highly exposed to flooding. In the Riparian countries of the DRB, flood defense and flood risk management are done in a reactive manner and as budgets allow. Relevant institutions have limited annual budgets to address urgent issues like structural defense needs, and currently do not take a climate risk-informed strategic approach (e.g. river basin approach) to	**Indicator target 3.1.** For each of 3 riparian countries a set of structural and non-structural flood protection options identified and designed using climate risk information and cost-benefit appraisal methods.	Project design documentation, CBA Mid-term evaluation, final report	Co-financiers fully meet its commitment towards implementation of structural flood protection measures Structural and non-structural measures met their design standards in reducing the risks to populations and reduction in
	Indicator 3.2: **(a)** Number of people directly protected from flood risks through structural measures at 3 high risk sites in Albania, FYR		**Indicator target 3.2.** (a) 10,000 people directly protected (b) 7000 ha protected, including agricultural and municipal land	Project annual reports. Mid-term evaluation, final report Field visits, pilot site reports	

	Macedonia and Montenegro (b) Area of land protected from flood risks through structural measures at AF project 3 sites	flood risk management interventions. Capacities to design climate-responsive and resilient flood protection structures are limited. Many defenses have exceeded their design life and have not been upgraded or maintained and are therefore now largely ineffective. There is limited use of modern eco-system-based flood risk management approaches and approaches which combine both structural and non-structural measures as part of FRM, due to a lack of knowledge and application of non-structural measures and ecosystem-based approaches (EbA) to flood risk management. There is also limited knowledge and capacities among local communities on climate resilient livelihoods for coping with climate-induced hazards.		Community surveys	agricultural land losses Communities actively participate in planning and implementation of risk reduction measures Effective cooperation and coordination with GIZ project on the implementation and enhancement of the FFEWS
	Indicator 3.3: (a) number of communities across DRB supported with non-structural measures and adaptation planning (including training, participatory planning and implementation) (b) scale of agroforestry measures implemented (ha)		**Indicator target 3.3.** (a) At least 50 communities across DRB are supported with training, participatory CRM and FRM planning and/or implementation of non-structural measures (b) At least 150 ha	Project annual reports. Mid-term evaluation, final report Demonstration site reports Community training and awareness workshop reports Community Surveys	

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s)[39]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
To assist the riparian countries in the implementation of an integrated climate-resilient river basin flood risk management approach in order to improve their capacity to manage flood risk at regional, national and local levels and to enhance resilience of vulnerable communities in the DRB to climate-induced floods.	Total Number of direct and indirect beneficiaries with reduced vulnerability to flood risks; Number of beneficiaries relative to total population Availability of high quality flood hazard and risk information generated and disseminated to stakeholders on a timely basis Number and level of effective coordination mechanisms for climate-resilient FRM in DRB	Outcome 1: Reduced exposure at national level to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	9,927,750
		Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.2. Number of people with reduced risk to extreme weather events	
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Improved climate and risk informed decision-making, availability and use of climate risk information	Indicator 1.1. a) Coverage and effectiveness of the hydrometric monitoring networks in riparian countries. b) Number of new observation stations installed Indicator 1.2: Level of introduction of modelling tools and technologies for the strategic flood risk assessment and flood hazard mapping Indicator 1.3. Level of implementation of the systematic	Output 1: Risk and vulnerability assessments conducted and updated at a national level	1.1. No. and type of projects that conduct and update risk and vulnerability assessments 1.2 Development of early warning systems	2,379,244
		Output 2.1: Strengthened capacity of national and regional centers and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events	

[39] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

	gender-sensitive socio-economic vulnerability assessment in the DRB			
Improved institutional arrangements, legislative and policy framework for climate-resilient FRM, and development of CCA and FRM strategy and plans at the basin, sub-basin, national and sub-national levels	Indicator 2.1: State of the Drin River Basin FRM Policy Framework and cooperation on flood risk management Indicator 2.2. **a)** % increase in institutional capacity to promote integrated climate resilient flood risk management b) Number of staff from targeted institutions trained to respond to impacts of climate-related events Indicator 2.3. State of Drin River Basin Integrated CCA and FRM Strategy	Output 2.2: Targeted population groups covered by adequate risk reduction systems	2.1.2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	1,120,756
		Output 7: Improved integration of climate-resilience strategies into country development plans	7.1. No., type, and sector of policies introduced or adjusted to address climate change risks	
Strengthened community resilience through improved flood forecasting and early warning, implementation of structural and non-structural measures and enhanced local capacity for CCA and FRM	Indicator 3.1: State of climate-responsive design of structural and non-structural measures for long-term FRM investment in DRB. Indicator 3.2: **(a)** Number of people directly protected from flood risks through structural measures at 3 high risk sites in Albania, FYR	Output 2.2: Targeted population groups covered by adequate risk reduction systems	2.2.1. Percentage of population covered by adequate risk-reduction systems	5,000,000
		Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1 No. and type of risk reduction actions or strategies introduced at local level	

	Macedonia and Montenegro (b) Area of land protected from flood risks through structural measures at AF project 3 sites Indicator 3.3: (a) number of communities across DRB supported with non-structural measures and adaptation planning (including training, participatory planning and implementation) (b) scale of agroforestry measures implemented (ha)	Output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by asset types)	
		Output 5: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	

G. Include a detailed budget with budget notes, broken down by country as applicable, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

G.1. Project Budget

Award ID:	Project ID(s):	TBD	Project ID(s):	TBD
Award Title:	TBD			
Business Unit:	SVK10			
Project Title:	Integrated climate-resilient transboundary flood risk management in the Drin River basin in the Western Balkans			
PIMS no.	6215			
Implementing Partner /Executing Agency	UNDP			

Project Outcomes	Fund ID	Atlas Budget Account Code	Atlas Budget Account Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	TOTAL (USD)	Notes
COMPONENT 1: Improved climate and risk informed decision-making, availability and use of climate risk information	62040	61300	**Salary & Post Adj Cst-IP Staff**	30,000.0	30,000.0	30,000.0	30,000.0	30,000.0	150,000.00	**P0**
		71200	**International Consultants**	-	-	11,666.0	-	11,667.0	23,333.00	**1A**
		71200	**International Consultants**	320,178.00	58,928.00	83,928.00	33,928.00	33,928.00	530,890.00	**1B, 4B**
		71300	**Local Consultants**	212,850.00	15,600.00	15,600.00	15,600.00	15,600.00	275,250.00	**1C**
		71400	**Contractual Services - Individ**	24,602.00	24,602.00	24,602.00	24,602.00	24,602.00	123,010.00	**P1**
		71600	**Travel**	12,333.0	12,333.0	12,333.0	12,333.0	12,333.0	61,665.00	**1H**
		72100a	**Contractual Services - Companies / Na**	426,251.00	70,000.00	-	-	-	496,251.00	**1G**
		72200	**Equipment and Furniture**	549,424.00	-	-	-	-	549,424.00	**1D**
		72400	**Communic & Audio Visual Equip**	900.00	900.00	900.00	900.00	900.00	4,500.00	**1K**
		72500	**Supplies**	250.00	250.00	250.00	250.00	250.00	1,250.00	**1L**
		72800	**Information Technology Equipmt**	50,000.00	-	-	-	-	50,000.00	**1E**
		73100	**Rental & Maintenance-Premises**	1,504.00	1,504.00	1,504.00	1,504.00	1,504.00	7,520.00	**P3**
		74100	**Professional Services**	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00	40,000.00	**1J**
		74200	**Audio Visual&Print Prod Costs**	4,000.00	4,000.00	4,000.00	4,000.00	5,151.00	21,151.00	**1I**
		71300	**Local Consultants**	45,000.00	-	-	-	-	45,000.00	**1F**
			Total Outcome 1	*1,685,292.0*	*226,117.0*	*192,783.0*	*131,117.0*	*143,935.0*	***2,379,244.00***	

COMPONENT 2: Improved institutional arrangements, legislative and policy framework for climate-resilient FRM, and development of CCA and FRM strategy and plans at the basin, sub-basin, national and sub-national levels	62040	61300	**Salary & Post Adj Cst-IP Staff**	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	150,000.00	**P0**
		71200	**International Consultants**	-	-	11,666.00	-	11,667.00	23,333.00	**1A**
		71200	**International Consultants**	75,000.00	48,000.00	-	-	-	123,000.00	**2B**
		71300	**Local Consultants**	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	30,000.00	**2J**
		71400	**Contractual Services - Individ**	24,602.00	24,602.00	24,602.00	24,602.00	24,602.00	123,010.00	**P1**
		71600	**Travel**	12,137.40	12,137.40	12,137.40	12,137.40	12,137.40	60,687.00	**2H**
		72100a	**Contractual Services - Companies / Na**	-	100,000.00	-	-	-	100,000.00	**2D**
		72100b	**Contractual Services - Companies / In**	-	133,200.00	139,253.00	-	-	272,453.00	**2E**
		72400	**Communic & Audio Visual Equip**	900.00	900.00	900.00	900.00	900.00	4,500.00	**2F**
		72500	**Supplies**	250.00	250.00	250.00	250.00	250.00	1,250.00	**2G**
		73100	**Rental & Maintenance-Premises**	1,504.60	1,504.60	1,504.60	1,504.60	1,504.60	7,523.00	**P3**
		75700	**Training, Workshops and Conference**	35,000.00	35,000.00	35,000.00	35,000.00	35,000.00	175,000.00	**2C**
		75700	**Training, Workshops and Confer**	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	50,000.00	**2I**
			Total Outcome 2	*195,394.00*	*401,594.00*	*271,313.00*	*120,394.00*	*132,061.00*	***1,120,756.00***	
COMPONENT 3: Strengthened community resilience through improved flood management through the implementation of structural and non-structural measures and enhanced local capacity for CCA and FRM	**62040**	61300	**Salary & Post Adj Cst-IP Staff**	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	100,000.00	**P0**
		71200	**International Consultants**	-	-	11,667.00	-	11,667.00	23,334.00	**1A**
		71200	**International Consultants**	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	100,000.00	**4B**
		71200	**International Consultants**	-	36,000.00	24,000.00	-	-	60,000.00	**3B**
		72100	**Contractual Services - Companies**	458,551.50	350,916.50	16,415.00	365,791.00	367,806.00	1,559,480.00	**3C**
		71400	**Contractual Services - Individ**	24,602.40	24,602.40	24,602.40	24,602.40	24,602.40	123,012.00	**P1**
		71600	**Travel**	12,528.60	12,528.60	12,528.60	12,528.60	12,528.60	62,643.00	**3H**
		72100a	**Contractual Services - Companies / Na**	-	472,500.00	1,039,518.00	1,058,743.00	-	2,570,761.00	**3D**
		72100	**Contractual Services - Companies**	150,000.00	200,000.00	-	-	-	350,000.00	**3E**
		72400	**Communic & Audio Visual Equip**	900.00	900.00	900.00	900.00	900.00	4,500.00	**3F**
		72500	**Supplies**	250.00	250.00	250.00	250.00	250.00	1,250.00	**3G**
		72800	**Information Technology Equipmt**	6,000.00	-	500.00	500.00	500.00	7,500.00	**3I**
		73400	**Rental & Maint of Other Equip**	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	30,000.00	**3J**
		73100	**Rental & Maintenance-Premises**	1,504.00	1,504.00	1,504.00	1,504.00	1,504.00	7,520.00	**P3**
			Total Outcome 3	*700,336.50*	*1,145,201.50*	*1,177,885.00*	*1,510,819.00*	*465,758.00*	***5,000,000.00***	
Project Management	**62040**	61300	**Salary & Post Adj Cst-IP Staff**	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	100,000.00	**P0**
		73100	**Rental & Maintenance-Premises**	6,306.40	6,306.40	6,306.40	6,306.40	6,306.40	31,532.00	**P3**
		71400	**Contractual Services - Individ**	57,900.00	57,900.00	57,900.00	57,900.00	57,900.00	289,500.00	**P2**
		71400	**Contractual Services - Individ**	16,193.60	16,193.60	16,193.60	16,193.60	16,193.60	80,968.00	**P1**
		74596	**Services to projects - GOE**	29,600.00	29,600.00	29,600.00	29,600.00	29,600.00	148,000.00	**P4**
			Project Management Cost	*130,000.00*	*130,000.00*	*130,000.00*	*130,000.00*	*130,000.00*	**650,000.00**	
			Total per year	*2,941,459.41*	*2,064,660.06*	*1,922,599.39*	*2,053,178.05*	*945,853.09*		
								Total Direct Cost	**9,150,000.00**	
								Total GMS (8.5%)	**777,750.00**	
								Grand Total (Direct cost and GMS)	**9,927,750.00**	

G.2. Budget Notes:

Budget Note No.	Clarification of the budget items/ Justification of the estimated costs
1A	Monitoring and Evaluation (Inception, APR, MTE, TE), Individual experts, estimated at 70.000 USD lump sum, divided among outcomes 1-3, allocated in Y3 and Y5
1B	International Hydrometric expert to review the existing coverage, physical condition and data collection procedures of the basin hydrometric network, working across all Riparian countries (35 days @ $600/day)
	International Hydrometric expert to develop the optimised basin hydrometric network plan (15days @ $600/day)
	Telecommunications expert to undertake an assessment of the telecommunicatiosn network to support telemetered and automated stations. (15 days @ 250/day)
	International Hydrometric expert to assess the institutional arrangements and capacity for the operation and maintenance of the hydrometric network and develop Institutional capacity development plan (short, medium and long-term) for hydrometric network O&M detailing manpower and financial requirements, and training needs, for the efficient O&M of all the stations in each Riparian country. Develop detailed training curriculum for training to be delivered during the project. Assess the existing protocols for the collection, transmission, sharing, storage, management and use of the observed data. Deliverable: Hydrometric network capacity development plan, training needs and recommendations and action plan for implementation of data sharing protocols and management (30 days @ $600/day)
	Implementation of action plan for data sharing protocols and management (30 days @ $600/day)
	International Hydrometric expert to develop hydrometric network O&M plan and assist countries to implement elements of the plan. 30 days @ $600/day
	Undertake high-level basin wider flood modelling, developing hydrological and hydraulic models of the basin = 80,000
	Integrated GIZ models into basin model
	Flood risk assessment capacity assessment and develop long-term capacity development plan, training needs and training curriculum for training to be provided by the project
	Develop and codify methods and tools for undertaking socio-economic surveys to collect necessary information to fully map the socio-economic conditions of within the basin.
	International consultant to develop a GIS-based flood risk model which integrates various spatial socio-economic data with the flood hazard maps, calculates flood risk, performs vulnerability assessment, produce vulnerability maps which will include damages and loss of life estimates and to test flood management options.
	Work with riparian countreis to identify and undertake appraisal-led cost-benefit analysis of FRM structural and none-structural options for long-term basin FRM
1C	National Hydrometric experts from each Riparian country to work under the international expert, to input to review of the existing coverage, physical condition and data collection procedures of the basin hydrometric network, working across all Riparian countries (3 x 60 days @ $400/day)
	Local consultant to develop specification including detailed design of of hydrometric stations (civil works etc.) and specification of equipment to be procured based on detailed optimised hydrometric network plan. Assume 15 days per country $250 per day
	International Hydrometric expert to review existing financing of hydrometric network O&M in each riparian country, identify resourcing, and training needs as well as institutional arrangements for the management of the proposed new hydrometric network. Develop and implement O&M financing mechanisms for the hydrometric network. 15 days @$600/day
	Project GIS experts to establish and populate the project SDI and data managemetn system and the undertaken GIS data collection, digitisation, analysis for the duration of the project. Assume on average 1 day per week for 5 years (260 days) @ $300/day.
	Undertake hydrological and hydraulic models of the DRB in Macedonia based on detailed surveys of the physical characteristics of the river basin, and produce high resolution EU flood hazard inundation maps (for Macedonia). Macedonia detailed modelling = 80,000.
	Local consultant to develop the GIS-based flood risk model for the DRB
1D	Procurement of hydrometric stations for Montenegro (cost provided minus vehicles) - Establishment of new hydrological and rainfall stations in the basin of Lake Skadar and the Adriatic Sea (95,000.00); Equipment for hydrological stations (66,000.00); Instruments for measuring, maintenance and improvement of work (67.000.00); Hardware and software(50,330.00); Trainings (20,000.00); Equipment for staff (14,400.00); Costs for performing one serie of hydrometric measurements and control of instruments (1,44.00)
	Procurement of hydrometric stations for Macedonia - Hydrological Stations ($137,700); Equipment fo Hydrometric measurement&Service ($63,825); Meteorological Stations ($92,900); Equipment for Service and Field Trip Meteorology (5,550); Raman Depolarization LIDAR for Meteorological Applications ($99,900); 1x Type CR1000 -ST-SW-NC ($1644); 2 x Dataloger CR300 ($1270); 3 x Type SP20 20W Solar Panel, solar panel, 20 W , Mounting kit ($960); 3 x Type CH150-SW, 12 V Charging Regulator – 3 (750); 1 x Type SR50A, sensor for snow depth, 3 m cable ($4,800); Mounting kit 19517 for SR50A ($125)

1E	Purchase of GIS software and hardware for proejct SDI (Arc GIS desktop = 3 licence x $3k; ArcGIS online with cloud hosting assuming 200 named users = 7-10K per year) = ($35k to $50)k + $9k = $50k
1F	30 junior experts hired on a short-term basis to digitise all relevant data for 3 months. Assume 100 stations with at least 3 recordings per day and 3 parameters = 110,000 records over 50 years. Assume digitisation @ 0.5 min per record = 1,900 days. Over 3 months, this will take approx. 30 people. @ $25 per day = $45,000
1G	Local survey company to undertake detailed topographic surveys of the river channel through high risk areas including all major infrastructure across the river (e.g. bridges, dams etc.) and along river banks (e.g. flood walls, levees etc.) for the Crn Drim in Macedonia
	Assuming LiDAR data acquired for the floodplain only and cheaper DEM data (or freely available DEM data) used for the rest of the catchment. Assume modelling for whole Crn Drim
	Acquire DEM data for the floodplain for whole basin (for high level model). Contingency for modelling Albania and Montenegro for detailed design
	Undertake socio-economic suevrys and developed necessary basin datasets for long-term socio-economic risk, vulnerability and damage and loss modelling
	Establishment of Desinventar and associated data collection tools for D&L accounting in all Riparian countries. Including training
	Develop harmonized methods, guidelines and procedures in line with Sendai Framework, 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.
1 H	Travel for Outcome 1/ including for monitoring and project implementation - 61.655
1I	Printing and publication of annual reports, publications $4,000 * 5 years - $20,000 included under Component 1
1J	Audit as per UNDP rules are regulations. Audit can either be done by an audit firm that is selected by the Office of Audit and Investigation at regional level or done at individual country level per CO/country component. Calculation 0.4% x total budget rounded to 40.000 USD, allocated in 2nd and 4th year but audit could be done at any time during implementation.
1K	Communication costs for Outcome 1, average 900 USD per year (mobile, internet) x 5 years = 4500
1L	Office supplies (office stationary, other small office supplies) for Outcome 1, Average 250 USD per year x 5 years= 1250
OUTCOME 2	
2B	Policy expert to review existing FM policy and enabling environments in each riparian country and develop basin FRM policies for the implementation of FRM legislative and policy framework in line with relevant EU directives. Mainly desk study and country-level consultations in eash Riparian country
	Economist/Insurance expert to provide techncial assistance to and guide the development basin risk transfer mechanisms. Overall responsibility for 1) Development of risk financing and risk transfer mechanisms strategy to include private sector engagement strategy for long-term implementation of risk financing and risk transfer mechanisms for national-level flood risk financing and resilience strategy; 2) identification or public-sector risk financing mechanisms for flood risk management; 3) Risk financing and transfer mechanisms products and tools identifiction (if existing); 4) development based on detailed socio-economic risk, damages and losses assessment (to be undertaken in Output 1.3); 5) Oversee feasibility studies of all identified and shortlisted risk financing mechanisms, development of a basin flood insurance model for the assessment of premiums and payouts of flood events of different return periods; 6) Oversee the development of basin flood insurance scheme. Assume 60 days at $800/day
	Institutional expert to undertake Institutional mapping to identify the current relevant national and sub-national government departments with functions in flood risk management in each Riparian country.
	Institutional expert to undertake Institutional capacity assessment and gap analysis to include functional, resourcing, technical and financial capacity assessment. Development of long-term Institutional capacity development plan addressing resourcing, technical, and financial needs in each Riparian. Develop training programme for climate risk management and flood risk management and embed in relevant national/regional institutions to improve the technical capacity and knowledge base for climate risk management and a long-term adaptation planning for flood risk management.
2C	Workshop to support policy development and consultation with relevant sector stakeholders. Assume 1 workshop per year for 5 years @ $5,000 per workshop
	Deliver prioritized training to practitioners, decision-makers and communities in all aspects of FRM. Assume 3 training sessiosn per year (15) and allow for 200 participants each time. Assume 10k per training
2D	Local consultant team to undertake: 3) Development of Risk financing and transfer mechanisms products and tools identifiction (if existing) and/or development based on detailed socio-economic risk, damages and losses assessment (to be undertaken in Output 1.3); 4) Undertakefeasibility studies of all identified and shortlisted risk financing mechanisms; 5) development of a basin flood insurance model for the assessment of premiums and payouts of flood events of different return periods;m Assume team of 5 lump sum fee
	The ToR of the Drin EWG Floods will be revisited in terms of mandate, membership, resource requirements, technical capacity and technical enabling environment; data sharing and data access and technical means and tools for coordination. In consultation with riparian countries and the DCG a strategy and a five-year work program of the Drin EWG Floods will be developed and implemented.

2E	Polic expert for Sector FRM policies (at least 2 - energy, agriculture) - Undertake detailed technical studies (including modelling) on climate change impacts on the identified sectors (energy and agriculture) in the DRB. Consult with national sector leaders and relevant stakeholders on findings of study and invite comments on recommendations through the floods working group. Develop and codify detailed methodologies for incorporating climate-change responsive flood risk considerations into risk assessments, strategies, policies and plans for the energy and agriculture sectors. Develop and finalize robust sector FRM policies and any necessary enabling guidelines and/or tools for effective implementation of new policies.
	Development of an integrated basin flood risk management plan for the DRB with participation of all relevant stakeholders. The plan will take a bottom-up, multi-stakeholder, consensus-based approach. This activity will be mainstreamed into the national on-going work on the development of the river basin management plans through the relevant national authorities. From the basin plan, and sub-national plans will be developed.
2F	Communication costs for Outcome 2, average 900 USD per year (mobile, internet) x 5 years = 4500
2G	Office supplies (office stationary, other small office supplies) for Outcome 2, Average 250 USD per year x 5 years= 1250
2I	Training, Workshops and Conferences (Inception workshop, steering committees, etc. $10,000 * 5 = $50,000 can put all under Component 2)
2J	National Gender Consultant/s, lump sum estimated at 30.000 USD; Included under Outcome 2 entirely, allocated to 5 years/6000 USD
2H	Travel for Outcome 2/ including for monitoring and project implementation
	OUTCOME 3
3B	Chief Resident Engineer - International Engineer to lead Studies to identify as long-list of options for FRM in DRB. Long list of options will be examined and qualitatively assessed in terms of the socio-economic, environmental, engineering and hydrological impacts of the options, and will form the basis of the short-listing process to be carried out in consultation with stakeholders. An initial appraisal of the short-listed options will be carried out to determine technical performance (through modelling) in terms of flood damages reduction in the basin. Feasibility outline and detailed design studies will be carried out on each preferred option/flood alleviation scheme. (assume $700/day for 20 days). Includes oversight of detailed engineering design of structural measures (assume $700/day for 20 days), Includes Resident Engineer duties (assume $700/day for 80 days)
3C	Local Engineering firm to undertake studies to identify as long-list of options forFRM in DRB. Long list of options will be examined and qualitatively assessed in terms of the socio-economic, environmental, engineering and hydrological impacts of the options, and will form the basis of the short-listing process to be carried out in consultation with stakeholders. An initial appraisal of the short-listed options will be carried out to determine technical performance (through modelling) in terms of flood damages reduction in the basin. Feasibility outline and detailed design studies will be carried out on each preferred option/flood alleviation scheme. (Assume $300/day for 60 days) x3
	Local engineers Albania working with relevant government institutes to undertake detailed design of priority structural measures
	Local company in Montenegro working with relevant government institutes to undertake detailed design of priority structural measures
	Local engineers in Macedonia working with relevant government institutes to undertake detailed design of priority structural measures
	development of a long-term maintenance plan for the protective embankment
	Studies to identify a long-list of non-structural options for FRM in DRB. Long list of options will be examined and qualitatively assessed in terms of the socio-economic, environmental, engineering and hydrological impacts of the options, and will form the basis of the short-listing process to be carried out in consultation with stakeholders. An initial appraisal of the short-listed options will be carried out to determine technical performance (through modelling, site visits, desk studies) in terms of flood damages reduction in the basin. Feasibility outline and detailed design studies will be carried out on each preferred non-structural option and assesment will be made in combination with the preferreed structural flood alleviation schemes idenfieid in 3.1.1. (assume $300/day for 40 days). Includes oversight of detailed design of non-structural measures (assume $300/day for 20 days)
	Implementation of non-structural measures in Albania
	Implementation of non-structural measures in Montenegro
	Implementation of non-structural measures in Macedonia
3D	Albania structural measure
	Montenegro - Upgrading and reinforcement of the protective embankment along the Bojana River
	Macedonia - Afforestation and management of bare lands (sparsely vegetated) affected with high erosion in the Sateska River Basin in total area of up to 100 hectares
	Macedonia - Construction of natural based sediment retention structures at fan apex or on fan (on 2 locations)
	FYR Macedonia - Improvement of hydraulic capacity of Crni Drim River with in urban zone
	FYR - Macedonia - Reconstruction, updating (increasing the capacity) of banks on Crni Drim in rural part in total length of up to 10 km
	FYR Macedonia - Improvement of existing drainage system in Struga municipality for underground flood protection

3E	Environmental Safeguard (EIA), lump sum 350.000 USD, Y 1 = 100.000 USD, Y 2 = 250.000 USD, allocated under Outcome 3
3F	Communication costs for Outcome 2, average 900 USD per year (mobile, internet) x 5 years = 4500
3G	Office supplies (office stationary, other small office supplies) for Outcome 3, Average 250 USD per year x 5 years= 1250
3H	Travel for Outcome 3/ including for monitoring and project implementation
3I	Office equipment, average 2500 USD per office for the project lifetime x 3 Cos = 7500 USD, Allocated in full under Outcome 3, 6000 in Y1, 500 USD in year 3, 4 and 5
3J	Fuel for project vehicle/contribution for use of CO owned vehicle, Unit = CO, Cost = average 2000 USD per year x 5 years = 10000 USD. This account also covers rent of vehicle or maintenance of vehicle; Included under Outcome 1, divided per year
4B	Chief Technical Advisor (CTA), lump sum 269,640 USD, allocated under Outcome 3 - 100.000 USD and Outcome 1 - 169.640 USD, allocated for 5 years
	OUTCOME 4 / Project Management
P0	Regional Project Manager, post estimated at 100.000 USD per year including salary at full/organizational cost plus removal costs. Cost is allocated under Outome 1 - 150.000 USD, Outcome 2- 150.000 USD, Outcome 3- 100.000 USD and Project Management Costs - 100.000 USD, allocated for 5 years
P1	National Project Coordinator, SC contract level SB4/SC10/1, average salary for MK under the assumption that all COs have similar salary scales, SB4/SC10/1. Unit =CO, Price = Annual salary with full organizational cost per person x 5 years x 3 persons (approx. 30000 USD x 5=1150000 USD); 150,000 USD x 3 = 450.000 USD. 18% or 80.968 USD allocated under project management costs, the remaining costs divided among 3 Outcomes equally
P2	Project Assistant, SC contract level SB3/SC7/3, average salary for MK under the assumption that all COs have similar salary scales, SB3/SC7/3. Unit =CO, Price = Annual salary with full organizational cost x 5 years (approx. 19.300 USD x 5=96.500 USD) 96.500 USD x 3 persons = 289.500 USD, Budgetted under Project Management costs, i.e.96.500 USD /5 years
P3	Office rent, 300 monthly rent + utilities x 60 months = 18000, Divided between Project Management Costs (58%) and Outcomes 1-3 (14%x3)
P4	UNDP Services to Projects - General Operating Expenses included under Project Management Costs

G.3. UNDP Services to the project (Total USD 148,000)

DESCRIPTION OF UNDP SUPPORT SERVICES FOR ISTANBUL REGIONAL HUB:

Support services	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
1. Human Resources			
Identification and/or recruitment of project personnel: Regional Project Manager	**In the first quarter of the project implementation**	US$ 736.75	**US$737** **UNDP will directly charge the project in accordance with the UPL**
Local Personnel HR & Benefits Administration & Management	**One- time fee, per staff at: the issuance of a contract, and- again at separation**	US$ 244.65 244.65 x 2	**US$ 489** **UNDP will directly charge the project in accordance with the UPL**
Recurrent personnel management services: **Local Payroll & Banking (35%)** **Performance evaluation (30%)** **Extension, promotion, entitlements (30%)**	**Annual fee per employee, per calendar year**	541.11 x 5 years	**US$ 2,706** **UNDP will directly charge the project in accordance with the UPL**

Total HR:			**US$ 3,932**
2. Finance			
Payment Process	**Ongoing throughout implementation when applicable**	44.21 x 150	**US$6,632** **UNDP will directly charge the project in accordance with the UPL**
Total Finance:			**US$6,632**
3. Procurement			
Procurement not involving CAP - below US$ 50,000	**As per the working plan**	260.18 x 8	**US$ 2,081** **UNDP will directly charge the project in accordance with the UPL**
Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	**As per the working plan**	659.46 x 4	**US$ 2,638** **UNDP will directly charge the project in accordance with the UPL**
Consultant recruitment	**As per the working plan**	286.20 x 20	**US$ 5,724** **UNDP will directly charge the project in accordance with the UPL**
Disposal of equipment	**At the end of the project implementation**	US$ 335.91	**US$ 336** **UNDP will directly charge the project in accordance with the UPL**
Total Procurement:			**US$ 10,779**
4. Admin Support			
Travel management (booking, purchase, F10 settlement)	**Ongoing throughout implementation when applicable**	US$ 78.08 x 89	**US$ 6,949** **UNDP will directly charge the project in accordance with the UPL**
Total Admin Support:			**US$ 6,949**
Total DPC			**USD 28,292**

DESCRIPTION OF UNDP SUPPORT SERVICES FOR ALBANIA:

Support services	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
1. Human Resources			
Identification and/or recruitment of project personnel -Project Coordinator (PC) and Project Assistant (PA)	In the first quarter of the project implementation	US$ 600*2 (PC &PA)	US$1,200 UNDP will directly charge the project in accordance with the UPL
Local Personnel HR & Benefits Administration & Management	One- time fee, per staff at: the issuance of a contract, and- again at separation	US$ 206*4 (contract issuance and separation for PC & PA	US$ 824 UNDP will directly charge the project in accordance with the UPL
Recurrent personnel management services: Local Payroll & Banking (35%) Performance evaluation (30%) Extension, promotion, entitlements (30%) Leave monitoring (5%)	Annual fee per employee, per calendar year	US$449*2 (PC&PA for 5 years duration)	US$ 4,490 UNDP will directly charge the project in accordance with the UPL
Consultant recruitment Advertising (20%) Shortlisting &selection (40%) Contract issuance (40%)	Per IC process	US$234*35	US$ 8,190 UNDP will directly charge the project in accordance with the UPL
Total HR:			**US$ 14,704**
2. Finance			
Payment Process	Ongoing throughout implementation as applicable	36* 500	US$**18,000** UNDP will directly charge the project in accordance with the UPL
Total Finance:			**US$18,000**
3. Procurement			
Procurement not involving CAP - below US$ 50,000	As per the work plan	217*18	US$ 3,906 UNDP will directly charge the project

			in accordance with the UPL
Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	As per the work plan	541*6	US$ 3,246 UNDP will directly charge the project in accordance with the UPL
Total Procurement:			**US$ 7,152**
4. Admin Support			
Travel request or authorization (40%) F10 settlement) (35%)	Ongoing throughout implementation as applicable	US$ 38*40 US$ 34*40	US$ 3,040 UNDP will directly charge the project in accordance with the UPL
Total Admin Support:			**US$ 3,040**
Total DPC			**USD 42,896**

DESCRIPTION OF UNDP SUPPORT SERVICES FOR THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA:

Support services	**Schedule for the provision of the support services**	**Cost to UNDP of providing such support services (where appropriate)**	**Amount and method of reimbursement of UNDP (where appropriate)**
1. Human Resources			
Identification and/or recruitment of project personnel -Project Manager and Project Assistant	In the first quarter of the project implementation	US$ 599.81 599.81 x 2	US$1,200 UNDP will directly charge the project in accordance with the UPL
Local Personnel HR & Benefits Administration & Management	One- time fee, per staff at: the issuance of a contract, and- again at separation	US$ 205.66 205.66 x4	US$ 822 UNDP will directly charge the project in accordance with the UPL
Recurrent personnel management services: Local Payroll & Banking (35%) Performance evaluation (30%) Extension, promotion, entitlements (30%)	Annual fee per employee, per calendar year	448.67 x 2persons x 5 years	US$ 4,487 UNDP will directly charge the project in accordance with the UPL
Total HR:			**US$ 6,509**
2. Finance			

Payment Process	Ongoing throughout implementation when applicable	38.49 x 500	US$**19,245** UNDP will directly charge the project in accordance with the UPL
Total Finance:			**US$19,245**
3. Procurement			
Procurement not involving CAP - below US$ 50,000	As per the working plan	217.35 x 15	US$ 3,260 UNDP will directly charge the project in accordance with the UPL
Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	As per the working plan	540.84 x 10	US$ 5,408 UNDP will directly charge the project in accordance with the UPL
Consultant recruitment	As per the working plan	234.26 x 20	US$ 4,685 UNDP will directly charge the project in accordance with the UPL
Total Procurement:			**US$ 13,353**
4. Admin Support			
Ticket request (booking, purchase, F10 settlement)	Ongoing throughout implementation when applicable	US$ 66.04 x 16	US$ 1,057 UNDP will directly charge the project in accordance with the UPL
Total Admin Support:			**US$ 1,057**
Total DPC			**USD 40,164**

DESCRIPTION OF UNDP SUPPORT SERVICES FOR MONTENEGRO:

Support services	**Schedule for the provision of the support services**	**Cost to UNDP of providing such support services (where appropriate)**	**Amount and method of reimbursement of UNDP (where appropriate)**
1. Human Resources			
Identification and/or recruitment of project personnel -Project Coordinator and Project Assistant	In the first quarter of the project implementation	US$ 599.81 599.81 x 2	US$1,200 UNDP will directly charge the project in accordance with the UPL

Local Personnel HR & Benefits Administration & Management	One- time fee, per staff at: the issuance of a contract, and- again at separation	US$ 205.66 205.66 x4	US$ 823 UNDP will directly charge the project in accordance with the UPL
Recurrent personnel management services: Local Payroll & Banking (35%) Performance evaluation (30%) Extension, promotion, entitlements (30%)	Annual fee per employee, per calendar year	448.67 x 2persons x 5 years	US$ 4,489 UNDP will directly charge the project in accordance with the UPL
Total HR:			**US$ 6,512**
2. Finance			
Payment Process	Ongoing throughout implementation when applicable	38.49 x 400	US$**15,396** UNDP will directly charge the project in accordance with the UPL
Total Finance:			**US$15,396**
3. Procurement			
Procurement not involving CAP - below US$ 50,000	As per the working plan	217.35 x 15	US$ 3,260 UNDP will directly charge the project in accordance with the UPL
Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	As per the working plan	540.84 x 10	US$ 5,408 UNDP will directly charge the project in accordance with the UPL
Consultant recruitment	As per the working plan	234.26 x 15	US$ 4,685 UNDP will directly charge the project in accordance with the UPL
Total Procurement:			**US$ 13,353**
4. Admin Support			
Travel request (booking, purchase, F10 settlement)	Ongoing throughout implementation when applicable	US$ 66.04 x 21	US$ 1,387 UNDP will directly charge the project in accordance with the UPL
Total Admin Support:			**US$ 1,387**
Total DPC			**USD 36,648**

270. The distribution of the Implementing Entity management fee budget use is provided in the **Annex 13.**

H. Include a disbursement schedule with time-bound milestones.

	Upon agreement & signature (US$)	**After Year 1** (US$)	**After Year 2** (US$)	**After Year 3** (US$)	**After Year 4** (US$)	**Total disbursed** (over 5 years)
Scheduled date (tentative)	Apr-19	Jun-20	Jun-21	Jun-22	Jun-23	
Project funds	2,581,022.50	1,772,912.50	1,641,981.00	1,762,330.00	741,754.00	**8,500,000.00**
Project Execution Costs	130,000.00	130,000.00	130,000.00	130,000.00	130,000.00	650,000.00
Implementing Entity fee (8.5%)	449,362.00	97,049.00	90,371.00	96,509.00	44,459.00	777,750.00
					Total	**9,927,750.00**

PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[40] *Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project / programme. Add more lines as necessary. The endorsement letters should be attached as an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:*

Albania *Blendi Klosi,* *Minister of Tourism and Environment*	Date*: 21 January 2019*
Montenegro *Igor Gradevic,* *General Director, directorate for EU Integration and International Cooperation* *Ministry of Sustainable Development and Tourism*	Date*: 5 September 2018*
The former Yugoslav Republic of Macedonia *Sabulla Duraki* *Minister of Environment and Physical Planning*	Date*: 6 September 2018*

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (including National Communications to the UNFCCC, national adaptation strategies, disaster risk reduction strategies and action plans etc.) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
 Pradeep Kurukulasuriya Executive Coordinator, a.i. Global Environmental Finance Bureau for Policy and Programme Support United Nations Development Programme	
Date: 6 January 2019	Tel. and email: pradeep.kurukulasuriya@undp.org
Project Contact Person: Natalia Olofinskaya, Regional Technical Advisor, UNDP IRH	
Tel. and Email: nataly.olofinskaya@undp.org; +90 (543) 532-3046	

6. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

ANNEXES:
(Provided in a separate file)

Annex 1. Letters of Endorsement
Annex 2. Socio-economic context
Annex 3. Approach to flood hazard, risk and vulnerability modelling
Annex 4. Potential risk financing mechanisms
Annex 5. Description of project sites and structural flood risk reduction measures
Annex 6. Social and Environmental Screening Template
Annex 7. Environmental and Social Management Plan (ESMP)
Annex 8. Gender Assessment and Action Plan
Annex 9. Stakeholder Consultations and Stakeholder Engagement Plan
Annex 10. Key relevant projects for cooperation
Annex 11. GIZ Project Brief. Climate change adaptation through transboundary flood risk management in the Western Balkans.
Annex 12. Proposed list of hydrometric equipment to be purchased and installed by the project
Annex 13. A breakdown of the IE Management Fee
Annex 14. Project timetable