UNITED NATIONS DEVELOPMENT PROGRAMME

PROJECT DOCUMENT

Republic of North Macedonia

Project Title: Improving Resilience to Floods in the Polog Region

Project Number: 00108024; 00113355

Implementing Partner: UNDP

Start Date: 20.11.2017 **End Date:** 31 December 2023 **PAC Meeting date:**

Brief Description
To address the growing flood-related challenges in the Polog Region and country-wide, and the associated socio-economic consequences, this programme includes a comprehensive set of complementary mitigation and resilience building measures funded by SDC and SECO. These measures, derived from new and existing flood risk assessment studies and plans, will be combined to maximize the benefits for communities and the environment. The project's ambitious goal is to instigate transformational change in managing flood risk in the region, accelerating the shift from purely reactive responses to floods to integrated systems to manage hazards, vulnerabilities and exposure of communities and assets in order to prevent/mitigate losses and alleviate the impact of future floods. The two components of the programme will contribute together to a higher-level goal of bringing about real transformation toward integrated flood risk management. While SECO-funded interventions will focus primarily on state-of-the-art urban resilience building and DRR finance, SDC will help improve national-level legal and regulatory environments, enhance flood preparedness, and introduce innovative technologies to early warning systems and nature-based solutions. More specifically, this four-year project aims to substantively support achieving: a) an improved knowledge of region's flood risk, causes and appropriate responses among authorities and other stakeholders; b) an inclusive approach to flood risk management planning in line with EU legislation that is sensitive to the specific needs of different vulnerable social groups; c) a better preparedness for flood risks and strengthened recovery capacity thanks to improved governance; d) progress toward flood risk-based urban and economic development; e) a reduction in the adverse consequences of future floods in high-risk areas through the repair or construction, as demonstration projects, of flood control infrastructure in line with contemporary approaches and techniques; f) creation of a flash-flood early warning and public-alert system; and g) progress in the adoption of the objectives and principles of the EU Floods Directive and the Sendai Framework for Disaster Risk Reduction. Combining these effects will ultimately measurably improve the overall community resilience to floods in the Polog Region and will assist in the alignment of the country-level flood management system with EU-based and other contemporary concepts and approaches. The project will be implemented in close cooperation with the Ministry of Environment and Physical Planning, the local self-governments of Polog Region municipalities, the Center for Development of the Polog Planning Region, the Hydro-Meteorological Service, the Crisis Management Centre, the Directorate for Protection and Rescue, the Water Management Organization and affected communities. The substantive revision is made to reflect the time and cost-extension of the SDC component of the project till 2023. Consequently, the timeframe for both components of the project shall be harmonized and completed at the same time.

Contributing Outcome (UNDAF/CPD, RPD or GPD):

UNSDCF and CPD 2016 - 2020

Outcome 4: By 2020, individuals, the private sector and state institutions base their actions on the principles of sustainable development, and communities are more resilient to disasters and environmental risks.

Output 4.4.

Communities, supported by a strong framework of national policies and infrastructure, are better prepared to prevent and respond to disasters, including the human displacement they can cause

UNSDCF and CPD 2021 – 2025

Outcome 3: By 2025, By 2025, people in North Macedonia benefit from ambitious climate action, sustainably managed natural resources and well-preserved biodiversity through good environmental governance and disaster resilient communities.

Output with gender marker:

"Output 3.4: Capacities at central and local levels are strengthened to identify multi-hazard risks and to plan, finance and implement effective disaster risk reduction and response, including human displacement, in line with the Sendai framework

Gender Marker: 2

Total resources required:		CHF 10,200,000 (USD 10,341,425) CHF 10,200,000 (US$ 10,341,425) + US$ 2,256,000 = US$ 12,456,000USD
Total resources allocated:		
	SECO:	CHF 6,900,000 (USD 7,084,188)
	SDC:	CHF 3,300,000 (USD 3,257,238) CHF 3,300,000 (US$ 3,257,238 + 2,256,00 = 5,513,238)
	Government: **Ministry of environment and Physical Planning** **Municipality of Gostivar**	 186,455.29 107,941.43
	In-Kind:	
Unfunded:		/

Agreed by (signatures):

Government	UNDP	Implementing Partner
Print Name: Naser Nuredini Minister of Environment and Physical Planning	Print Name: Armen Grigoryan Resident Representative	Print Name:
Date:	Date:	Date:

I. DEVELOPMENT CHALLENGE

The Republic of North Macedonia is a disaster-prone country that is particularly vulnerable to the risk of floods. Most river basins experience dramatic variations in water flows over time, and the risk of floods is also exacerbated by the country's mountainous topography and land structure. In recent years, extreme weather events caused by changing climate conditions, including torrential rains, have heightened this risk. However, human factors are also at work. Changing land use and land cover – for example, through cultivation or construction in wetland areas, rapid urbanization and heightened erosion from logging in forests – are altering hydrological regimes, increasing the risk of floods. Other causes include incomplete, poorly maintained, decaying or inappropriately used flood control infrastructure.

Damages and losses caused by floods have been on the rise over the past few years. River floods in the major basins are caused by long periods of rainfall and rapid snow melting. Intensive rainfall and increase of groundwater levels in combination with poorly maintained flood control infrastructure result in frequent flooding of flat, mainly former wetland areas. Torrential floods normally occur in smaller basins characterized by dominantly mountainous topography.

The tragic consequences of the most recent extreme flood events, and the magnitude of associated damages and losses, revealed major deficiencies throughout all components of the overall flood management system (e.g., monitoring, planning, response and recovery).

For example, the severe flooding that hit much of the country in January and February 2015 caused widespread damage and economic losses in 44 municipalities. The most affected regions were the basins of the Crna Reka, Bregalnica and Strumica rivers, which cover about 45% of the territory of the country. Roughly 170,000 people were affected in all. The floods caused major damages to infrastructure, private houses, private-sector industrial facilities, schools and public facilities. The impact assessment estimated the total cost of the spring 2015 floods at over EUR 35.7 million.

On the night of 6-7 August 2016, heavy torrential rain caused flash floods in the suburbs of Skopje, causing the tragic loss of 23 lives and an estimated cost of over EUR 30 million on account of the severely damaged infrastructure and affected agricultural land.

The frequency of flooding, however, is higher in the northwestern region (Polog) than anywhere else in the country (Figure 1). On 3 August 2015, after torrential rains lasting less than two hours, the region was hit by a combination of flash floods and landslides that caused six deaths and an estimated USD 21.5 million in damage. The Pena River inundated the center of the City of Tetovo and submerged many agricultural fields in nearby areas (Figure 2). The regional road from Tetovo to the Kosovo border was blocked by sludge that in places reached four meters high; and parts of the mountainside village of Sipkovica were buried in mud, boulders and rubble from a collapsed former dumpsite.

Such magnitude of consequences of recent floods is a result of incomplete, missing or poorly maintained structural measures in combination with poor policies and legislation, institutional and inter-agency coordination deficiencies, unclear communication mechanisms in time of crisis and limited community awareness. The lack of clarity on the roles of different institutions in the system, their limited capacities and funding constraints have contributed together to an inefficient response to the floods, amplifying their adverse effects.

The floods have also affected certain social groups disproportionately. An insight into casualty statistics and the distribution of damages and losses experienced by different social groups shows that the rural poor, Roma, people with disabilities and the elderly, and women and children are more severely affected than others. This is a result of major gaps in already inefficient disaster risk management/flood management systems that lack sensitivity to vulnerable groups.

Ironically, in the absence of other economic opportunities, many vulnerable groups tend to build homes and expand activities (mainly agricultural production) on unregulated floodplains alongside torrential streams and rivers outside richer urban centers. Besides diminishing floodplains, the reduction of forest cover plays an important role in the growing risk of floods and associated effects (e.g., sediment transport, landslides and rockfalls). Depredation of forests results from unsustainable resource management practices driven by a lack of alternative livelihood options. Limited financial resources also undermine adherence to building

codes for houses and other structures. This combination of high exposure and vulnerability of structures in built areas pose keen threats to the lives and economic activity of vulnerable communities.

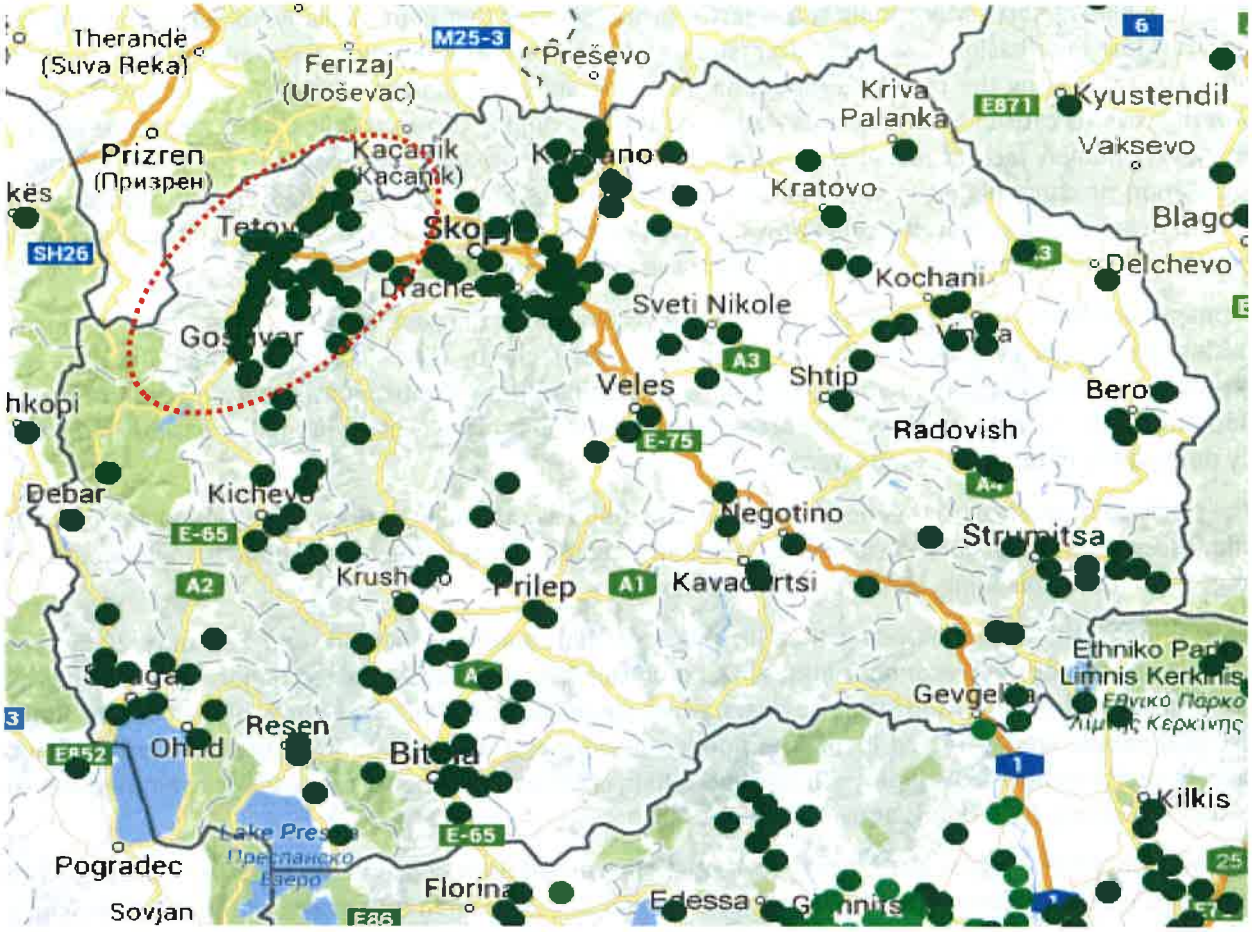

Fig. 1. Registered flood events in the country in the last 60 years. The density of green dots between Gostivar and Tetovo in the northwest illustrate the high frequency of flooding in the Polog Region.

In a situation of rapid and largely unsustainable urban development that is typical for the Polog Region, there is also enhanced pluvial flooding (increased surface runoff) caused by the growing percentage of impermeable built areas (e.g., residential and commercial buildings, roads and streets, and paved parking spaces), mostly at the expense of natural areas (e.g., floodplains, wetlands, forest, and other green spaces with significant water retention/infiltration capacity). Besides the increased frequency and intensity of human-made urban floods, the reduced infiltration of rainwater also causes a number of related adverse effects, including: a) reduction of groundwater recharge – an effect that limits the availability of water for different economic and environmental purposes and reduces the base flow in rivers during dry periods, affecting biodiversity and the overall integrity of the river ecosystem; b) release of high quantities of polluting substances (nutrients, sediments, heavy metals, organic matter and synthetic compounds) in the receiving water bodies, which causes a cascade of degradation processes; and c) increase of erosion processes in riverbeds which also increases flood risk and damages human-made infrastructure (e.g., bridges, culverts).

Rapid urbanization and the experiences from the latest flood events raise concerns over the relevance of the commonly applied urban stormwater management approaches in the country. Namely, the traditional approaches aim at securing draining of urban runoff as quickly as possible with the help of channels and pipes, which increases peak flows and costs of stormwater management. There is an increased understanding that this type of solution only transfers flood problems from one part of the basin to another. Also, the design standards used by engineers in the country (e.g., in terms of recommended design discharges for defining piping diameters) no longer correspond to the actual peak discharges due to the changes posed by urbanization. As a consequence, even moderate precipitation quantities and intensity tend to cause major urban flooding in areas that are believed to be well protected (i.e., are covered by drainage systems).

In addition to the areas with inappropriate drainage solutions, large urbanized parts also have incomplete stormwater drainage systems that leave them with virtually no protection against growing urban flooding.

wever, this incompleteness of the protection systems provides an opportunity to introduce and promote tter management approaches, including detention and retention ponds, rainwater harvesting, green ofs, infiltration areas, constructed wetlands, pervious pavements, as well as redefined/improved design andards for urban drainage systems where no other solutions can be applied (e.g., by taking into account urrent and likely future floods, as a climate change adaptation measure).

epeated disasters in which human factors played such a significant role have led to a growing realization hat transformational change is needed in dealing with floods and disasters in general. Documenting the damages and losses of these recent disasters and comparing them with the costs of prevention/mitigation and proper preparedness has made the authorities more aware of the need to increase public expenditures to create and maintain an efficient disaster risk management system. Understanding has grown of the need to reform the overall system in line with contemporary disaster risk reduction (DRR) and integrated flood risk management approaches. Deficiencies have been recognized and assistance has been requested by various government entities in flood management planning, operative flood protection, including recovery of existing and introducing new efficient flood control infrastructure, and emergency planning and response. Here, prevention and preparedness are every bit as important as better engineering solutions.

The adoption and operationalization of the EU Floods Directive – the only piece of EU water-related legislation not yet incorporated into the national systems – is considered particularly instrumental to creating systemic capacity for preventing similar outcomes of flood events in the future. The harmonization of the existing water management and other related systems in the country with the objectives of the EU Floods Directive provides an opportunity to replace now-standard ad-hoc responses to flood events and traditional flood control approaches based on purely engineering/design-based standards with an integrated risk-based flood management.

In such a setting, piloting contemporary approaches to flood risk management, especially in high-risk areas such as Polog, the Strumica River Basin and Pelagonija, would provide critical country examples of how to address deficiencies in an integrated manner. Creating such models would provide proof-of-concept to pave the way to future replication and scaling-up.

A few international organizations and donors have also recognized the momentum for change and have either financed or are financing different projects contributing to the overall improvement of the flood management system. For example, the EU financed a EUR 10 million UNDP-implemented flood recovery programme with the aim to 'build back better' critical transport and flood control infrastructure damaged during the 2015 floods in the country's east, southeast and Pelagonija regions. In line with the priorities of the Sendai Framework for Disaster Risk Reduction (SFDRR), these recovery efforts also had a disaster risk reduction dimension expressed through: a) building infrastructure that is more resilient to future similar floods; b) ensuring that the recovered infrastructure does not increase the risk of floods and if possible helps to mitigate it; and c) creating conditions for future government-led maintenance and similar recovery efforts in line with DRR principles.

The Adaptation Fund is providing funding for the regional project "Integrated climate-resilient transboundary flood risk management in the Drin River basin in the Western Balkans" (2019 -2024). The objective of the project is to assist the riparian countries ((Alb. MKD, MNG) 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 Drin River Basin (DRB) to climate-induced floods. The following results shall be achieved: (i) Improved climate and risk informed decision-making, availability and use of climate risk information; (ii) Improved institutional arrangements, legislative and policy framework for climate-resilient Flood Risk Management, and development of Climate Change Adaptation and Flood Risk Management Strategy and Plans at the basin, sub-basin, national and sub-national levels; (iii) Strengthened community resilience through improved flood management, through implementation of structural and non-structural measures and enhanced local capacity for climate change adaptation and flood risk management.

The 3-year EU-funded IPA Floods and Fires program (2021 – 2023) aims at improving capacities for flood and forest fire risk management in Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, Serbia and Turkey. By fostering regional cooperation and exchange of good practices, the IPA Floods and Fires implementing Consortium (Italian Civil Protection Department, CIMA Research Foundation, Swedish Civil Contingencies Agency, Administration of the Republic of Slovenia for Civil Protection and Disaster Relief,

Fire Rescue Brigade of Moravian Silesian Region, Romanian General Inspectorate for Emergency
Romanian National Centre for Disaster Management Foundation) collaborates with the local auth
civil protection and other relevant local agencies and institutions to improve the legal and ins
framework related to the EU floods directive (EUFD), and institutional coordination among all th
involved in the EUFD implementation, and to improve prevention, preparedness and capacity to res
forest fires at central, regional and EU level. Activities will include workshops, trainings, table-top an
exercises, exchange of experts, procurement of ground forest firefighting equipment and awareness r
campaigns. The main national beneficiary of the project is the Directorate for Protection and Rescue.

Post-disaster response in Polog – overview of expert findings and recommendations

The entire Polog Region faces a heightened flood risk owing to the area's mountainous topography and t
dense hydrographic network comprising torrential streambeds that are 'mobilized' into torrents even b
modest amounts of precipitation. In contrast to the river flooding that plagues other regions, the flash floods
that regularly hit Polog occur virtually without warning. The potential for disasters of this sort is certain to
rise as climate change increases the frequency of extreme weather events, including torrential rainfalls.

In the months that followed the disastrous event on 3 August 2015, UNDP conducted a series of assessments
aimed at identifying the causes of the disaster and recommending measures to prevent similar eventsin the
future. These assessments placed emphasis on those parts of the Polog Region that were the most affected
by the recent floods. Besides the Pena River – the Polog (Upper Vardar River Basin) region's largest torrential
water course – another 12 main torrential streams extending across the administrative boundaries of three
municipalities (Tetovo, Tearce and Bogovinje) were analyzed.

These comprehensive analyses identified the following key causes of the disastrous consequences of the
flood event: a) inadequate public investment in maintenance of existing and construction of new
infrastructure as needed; b) disregard of safety regulations governing the location of houses and other
buildings; c) failure to apply flood risk-based urban planning principles (even basic urban planning
requirements are generally not applied in most rural, and often urban locations, making urban development
a largely uncontrolled and unsustainable activity); d) disposal of garbage without regard for health, safety or
environmental concerns, which also reduces the discharge capacity of torrential streams and regulations at
critical sections, contributing to enhanced harmful debris flow; and e) major systemic deficiencies in the
overall governance system for flood preparedness and disaster risk reduction.

Victims of this rapid torrential flood were women, children and elderly men who did not receive timely
assistance and lacked the knowledge, skills and/or mobility to react to such situations.

Moreover, despite the well-known high flood risk, no flash flood early-warning system has ever been
introduced to the region. None of the region's four meteorological and two hydrological stations was
working at the time of the 3 August 2016 flash floods, and thus it was not even possible to assess
precipitation intensity and distribution, let alone convey any warning to the at-risk population. Moreover,
there is no working public alert system anywhere in the country.

Using the most advanced GIS-based tools and a detailed cost-benefit analysis of various flood risk and water
management options, UNDP has produced an action plan that presents a clear and prioritized list of
preventive measures, including early-warning systems, and capital investments. Recommendations also
include improvements in the legal system and community awareness activities.

Drawing on all findings, this UNDP-backed assessment suggested the following short-term priority
prevention and mitigation measures:

- Reactivation of a flash-flood early-warning system to cover the entire Polog Region, based on the reconstruction of existing and introduction of new hydrological-meteorological stations, along with a new public alert system and disaster preparedness exercises;
- Reconstruction of six protective check-dams in the Pena River that will protect the City of Tetovo from flooding (three were almost entirely destroyed in the flooding of August 2015, and the other three were heavily damaged);
- Design and construction of a supplemental storm-drain channel in Tetovo, which will extend the existing channel by approximately 1,000 m;

- The cleaning, repair, upgrading and proper maintenance of existing storm-drain channels; and
- Design and construction of protective check dams, storm-drain channels and other flood control measures in a few priority torrential streams.

Longer term, the plan envisages measures to remediate the illicit waste dumps that in many villages and municipalities are located along the course of storm torrents above mountain villages (as was the case with Sipkovica in August 2015); to improve building codes and zoning regulations and to tighten their enforcement to make houses more durable and prevent construction in high-risk areas; and to require the use of more disaster-resistant building materials in both residential and commercial construction.

Taken together, the total cost of all recommended measures amounts to an estimated USD 19.8 million. In recognition that this is a large investment, an action plan for flood prevention in the Polog Region has been prepared in a modular fashion, so that urgent measures can be funded with smaller amounts while larger resources can be mobilized for measures that will need to be implemented over several years.

Recovery needs and ongoing efforts in Polog

The combination of deficiencies in infrastructure, policies and human behavior point to the need for both "soft" measures to empower communities to better understand, prepare for and respond to risks they face and "hard" investments in flood prevention. This combination will help address the sense of marginalization felt by the Polog Region and preserve social cohesion, given that this is the country's only majority ethnic-Albanian region. Very little dedicated funding has been made available from the central government to address the growing flood risks in Polog, and the constituent municipalities lack both the resources and the capacity needed to undertake them on their own.[1]

The Ministry of Local Self-Government cost-shared funding with UNDP to implement priority recovery and flood mitigation activities totaling slightly more than USD 400,000. But this was insufficient to address the real flood prevention needs of the region.

The Government managed to mobilize about EUR 10 million from the EU for a program aimed at restoring and improving transport and flood-prevention infrastructure in southern and eastern regions affected by river flooding in early 2015. This programme was the EU's response to the Government's request to financially support country-wide flood recovery efforts in the areas affected by the 2015 floods. The funding was made possible through reallocation of savings on non-performing or decommitted projects in the country in response to the emergency. A Government decision based on an earlier World Bank and EU-supported Rapid Disaster and Needs Assessment (RDNA, 2015) tied the EU funding to several pre-selected priority recovery projects. When the Polog flood occurred, the EU funding was already committed to address the effects of the 2015 floods, leaving virtually no possibility for including the Polog Region in the recovery program.

The small-scale Government funding for Polog secured through the Ministry of Local Self-Government was combined with a UNDP contribution to address the following high priority needs: a) reactivation of the regional early-warning system by reconstruction of existing and introduction of new hydrological-meteorological stations for the area of the three municipalities most affected by the recent floods (Tetovo, Tearce and Bogovinje); b) reconstruction of three out of six check-dams on the Pena River (see Figure 3); c) waste clean-up campaigns targeting torrential streams and possible debris-generation areas; and d) preparation of additional technical documentation for future investments.

The activities were focused only on the part of Polog that was affected by the 2015 floods, while high flood risk persists across a much larger area. An integrated approach to long-term flood risk management aligned with contemporary approaches would require expanding the geographic scope of the assessments across the entire Upper Vardar River Basin comprising the territories of nine municipalities: Tetovo, Bogovinje, Tearce, Gostivar, Vrapciste, Mavrovo-Rostusa, Brvenica, Zelino and Jegunovce (see map below). Broadening and deepening these analyses would enable comparison of alternative management scenarios, and prioritization of investments to optimize outcomes and achieve high cost-effectiveness of available funding.

[1] Polog is the poorest region of the country's eight regions. Annual GDP per person in Polog is MKD 118,672 (USD 2,140), one-third of the MKD 348,915 (USD 6,340) in Skopje, the wealthiest region (*Source*: http://www.stat.gov.mk/pdf/2015/3.1.15.07.pdf)

Besides conceptualizing infrastructural flood mitigation measures, a comprehensive planning process should also help address some of the earlier described key systemic impediments, prototyping an integrated basin-scale flood risk management system. The system needs to include a full range of improvements in the 'source-pathway-receptor' continuum of the flood risk management options (Figure 4). A comprehensive feasibility analysis needs to explore the individual viability of different flood risk management options considering the specifics of the local context, mindful of the ecosystem conservation needs (including the role that ecosystems can play in reducing flood risk), and a profound understanding of the sustainability prospects. Such a foundation is required so that all future funding decisions on DRR and flood risk mitigation in the Polog Region are informed by clear strategic guidelines that should replace reactive, ad-hoc approaches to floods that have proven to come at extremely high societal costs.

Fig. 2. Flooding in Tetovo on 3 August 2016 and flood damage along the Pena River

Such a planning effort will help decision-makers and communities to understand the optimal combination of necessary basin-scale measures (e.g., better forest cover to reduce runoff), infrastructure development needs, zoning/urban planning requirements, applying building codes, early warning/public alerting, and ways of dealing with residual risks (e.g., through insurance). Putting an emphasis in analysis and planning efforts on the specific vulnerabilities of different social groups and corresponding specific protection measures will reduce the unacceptable fatalities to the lowest possible levels and also address social inclusion challenges. In this way, the necessary post-disaster recovery efforts for Polog will be structured in a way to reduce risks and improve the overall flood resilience of communities in the Polog Region.

Fig. 3. Check-dams on the Pena River after the flash floods on 3 August 2015 and ongoing reconstruction

II. STRATEGY

To address the growing flood-related challenges in the Polog Region and the associated socio-economic consequences, a comprehensive set of measures is proposed as part of this project for which complementary funding will be provided by the Swiss Agency for Development and Cooperation (SDC) and the Swiss State Secretariat for Economic Affairs (SECO). These measures, derived from new and existing flood risk assessment studies and plans, will be combined to maximize the benefits for communities and the environment. The project has the ambitious goal of instigating transformational change in managing flood risk in the region, supporting an accelerated evolution from reactive responses to floods to integrated systems for reducing and managing the hazards, vulnerabilities and exposure of communities and assets to prevent/mitigate losses and alleviate impacts of future floods. It will therefore be used as an example for improving the national framework for flood risk management, including securing long-term financing mechanisms.

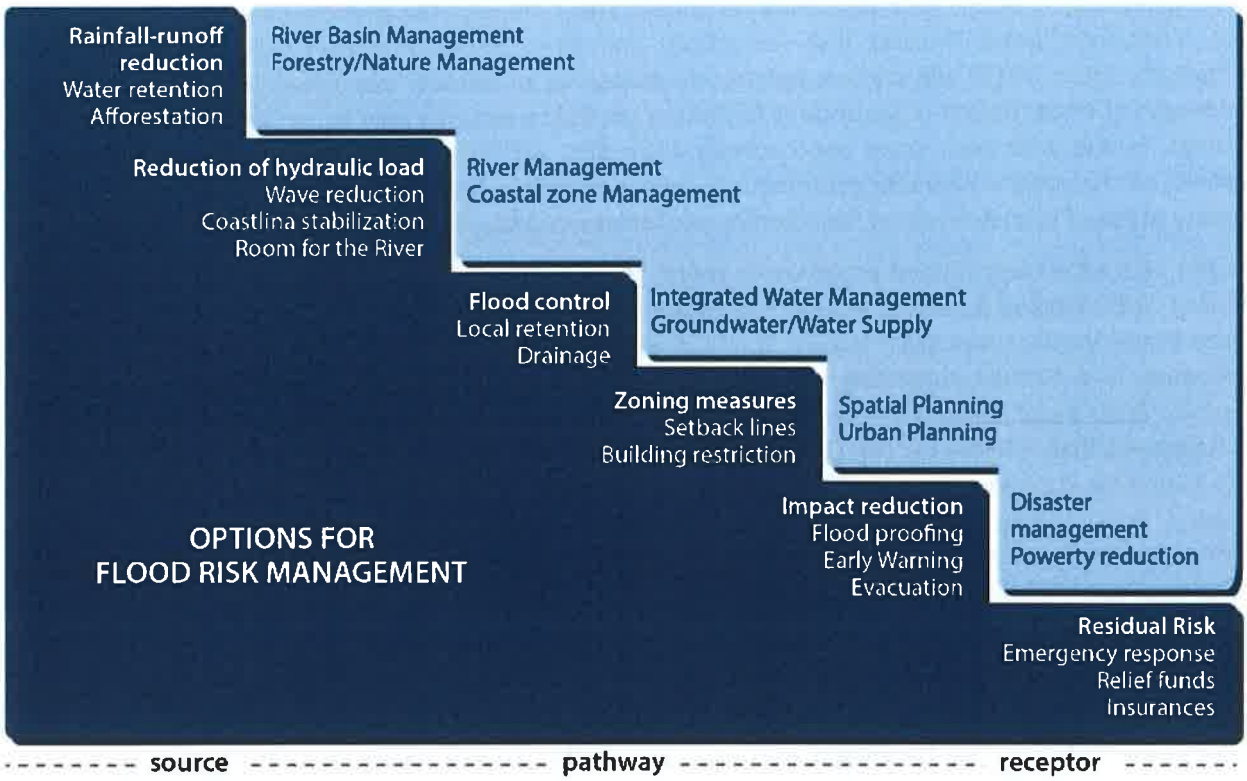

Fig. 4 'Cascade of measures' for integrated flood risk management

The project is based on the concept of risk reduction by identifying and addressing underlying causes and drivers (e.g., improper urbanization, poor resource management practices, socio-economic conditions and inequalities, environmental degradation as well as climate change effects). Following a process of robust participatory planning, the project will support the implementation of an optimized combination of basin-scale measures including institutional development for better flood risk management, the creation of basin-wide flash flood early warning and public alert systems, and infrastructure recovery and/or development projects that demonstrate cutting-edge approaches and contemporary international experiences (e.g., from

Switzerland and the EU). The project-backed flood risk management planning process will not only provide short-term measures to be implemented in its later stages, but will also build a long-term flood risk reduction strategy for the region aiming to guide future investments by government agencies, municipalities and donors.

More specifically, this four-year project aims to substantively support achieving: a) an improved knowledge of region's flood risk, causes and appropriate responses among authorities and other stakeholders; b) an inclusive approach to flood risk management planning in line with EU legislation that is sensitive to the specific needs of different vulnerable social groups; c) a better preparedness for flood risks and strengthened recovery capacity thanks to improved governance; d) progress toward flood risk-based urban and economic development; e) a reduction in the adverse consequences of future floods in high-risk areas of the basin through the repair or construction of flood control infrastructure in line with contemporary approaches and techniques, as well as demonstration of contemporary approaches to flood control in different types of settings (e.g., rural and urban) ; f) creation of a basin-scale flash-flood early warning and public-alert system; and g) progress in the adoption of the objectives and principles of the EU Floods Directive.

Combining these effects will ultimately measurably improve the overall community resilience to floods in the Polog Region and will assist the alignment of the country-level flood management system with EU-based and other contemporary concepts and approaches.

The program is designed to avoid duplication of SDC- and SECO-funded interventions, and avoid interdependencies, but rather to ensure complementarity and create synergies that will contribute to a higher-level goal of bringing about real transformation toward integrated flood risk management. While SECO-funded interventions will greatly focus on building a comprehensive, long-term flood risk mitigation/DRR planning base, state-of-the-art urban resilience building, and risk financing, the SDC-funded components will help improve the national-level legal and regulatory environment, improve flood preparedness, and introduce innovative technologies to early warning systems and nature-based (bioengineering) solutions for flood control in remote areas, through the application of the principles of Eco-DRR (Ecosystem-based Disaster Risk Reduction) and EbA (Ecosystem-based Adaptation). In terms of geographic focus, SECO will place emphasis on measures in densely populated urban areas facing the challenges of uncontrolled urbanizations (although possible measures may be implemented outside urban settings, in line with basin-scale approaches), while SDC will support flood protection and building the capacity of the most vulnerable communities, which are often located in mountainous rural settlements directly exposed to the effects of flash floods, and/or source areas for floods affecting downstream parts.

As part of a separately funded preparatory stage, SECO funding will be used to expand and upgrade the existing UNDP-backed feasibility assessment of flood risk mitigation options for parts of Polog to cover the entire Upper Vardar River Basin (Figure 5) in line with integrated basin-scale management approaches. By replicating and further enhancing the methodology developed under the SDC-funded *Restoration of Strumica River Basin* project, the project will support the development of a full-scale EU-based Flood Risk Management Plan (FRMP) for the Upper Vardar River Basin. Sophisticated flood-risk modelling combined with economic cost-benefit analyses, and community-based prioritization, will be applied to identify the possible flood mitigation options and evaluate them against a wide range of technical, financial, environmental, social and economic feasibility criteria. Scheduled for the earliest stages of the project, this planning effort will provide important additional details to support project funding decisions.

The project will facilitate a planning effort that will be carried out through a collaborative multi-institutional and community-based process of risk assessment and prioritization of mitigation response. In so doing, it will prototype an approach with a great scaling-up potential. The earlier developed flood risk management planning methodology will be enhanced to include specific data on exposure and vulnerability of critical infrastructure, and disaggregated demographic and social data (e.g., proportion of women, men and children; ethnic structure, including Roma; people with disabilities and other vulnerable groups in the high risk areas), generating in the process site-specific interventions to address the key threats to sustainable development from floods, vulnerabilities and inequalities among affected social groups.

The FRMP will consider the effects of climate change on future floods. For this purpose, the latest regional climate change models will be downscaled for the Upper Vardar River Basin to better assess the changes in the magnitude and frequency of flooding and formulate specific climate-sensitive measures (e.g., adjusted design standards for flood control structures to accommodate increased discharges; and more cautious

urban development that considers an anticipated increase in the frequency and intensity of floods). Moreover, the results of the UNDP commissioned analyses (2020) of the future climate change projections and indicators of the possible changes in the intensity and frequency of extreme weather and climate events for the Polog region will be taken into consideration.

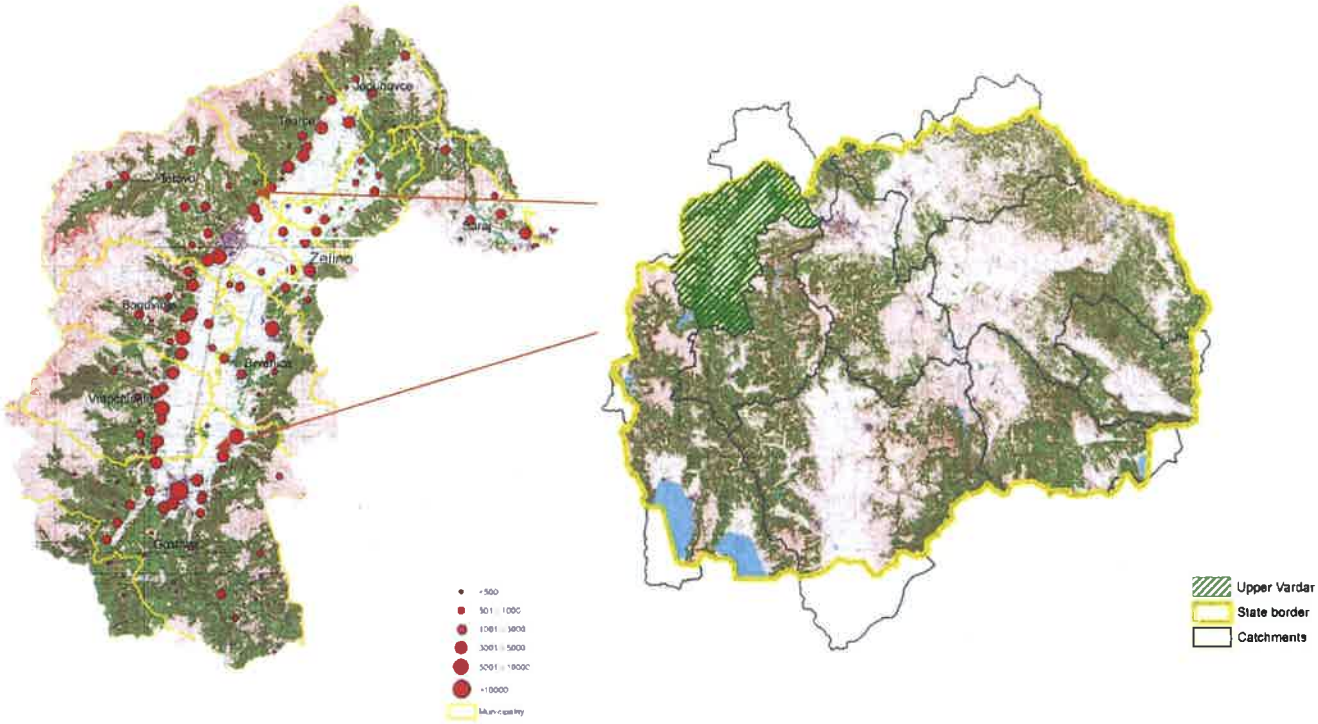

Fig. 5 Geographical scope and location of the project area

Besides the obvious benefits for the Polog Region, applying a basin-scale approach to flood risk mitigation and early-warning will also be beneficial in providing better protection for the City of Skopje since the Upper Vardar River Basin is a major contributor to heightened flood risk in the country's capital, especially in a situation of coincidence of peak flows with other tributaries.

The planning process will produce numerous flood hazard and flood risk maps for the region with multiple possible applications. As part of the project, municipalities will be supported to 'institutionalize' the maps and the FRMP, helping to mainstream DRR and flood risk mitigation objectives into local development agendas. In the early stages, the project will initiate the process of alignment of existing municipal operative flood defense plans with the objectives of the FRMP. Later, through interactive training programs and real-life case studies for selected Polog communities, the project will support the preparation of risk-based urban plans, coupled with economic analyses that will show the gains and losses (economic and environmental) of different urban development scenarios in the areas at high risk of flooding. The improved understanding of the negative externalities associated with currently applied urban development approaches resulting in high threats to people and assets is expected to initiate a longer-term transformation toward risk-sensitive and environmentally friendlier urban planning.

Recognizing the differences in capacities of municipalities to adopt and apply the principles of integrated flood risk management, the project will work with them to identify proper basin-scale institutional/administrative setup models. As part of these efforts, different options of inter-municipal cooperation in flood risk management will be explored, considering earlier experiences from delivering other types of services to citizens by sharing resources.

Considering the difference in maturity of various anticipated flood risk mitigation measures, the project would apply a modular implementation approach. This would allow for early implementation of mature interventions, based on existing UNDP-backed assessments and design studies. One such intervention would be the full reactivation of the flood/sediment control system on the Pena River upstream of the City of Tetovo.

The ability to quickly initiate the implementation of already prioritized field interventions will not only help to address some of the most urgent flood mitigation needs, but also build an overall positive image of the project, inspiring community mobilization and fundraising.

At the later stages, once the FRMP is developed and priorities are agreed with stakeholders, the project will support additional measures focusing on the basin communities at high risk of flooding. The anticipated field measures would entail the introduction of measures to improve the hydrological regime in the basin, as well as modern flood/sediment control measures in streambeds and basins of the most potentially destructive torrents, backed by soft measures focusing on community awareness of floods and possible management responses. The project will explore the viability of a wide range of 'no regret' measures based on Eco-DRR and EbA approaches that use ecosystem properties to enhance a region's resilience to floods and changing climate. Among the key criteria for the selection of implementation measures will be the readiness, capacity and access to financial resources of responsible institutions (e.g., secure partner contributions by central and local authorities for implementation of certain measures, and to maintain the infrastructure). The project will provide an analysis of the annual operation and maintenance costs of the infrastructure necessary to ensure the durability of the measures and its optimal performance in reducing flood risks.[2]

As part of the SDC-funded component, a flash-flood early warning and public-alert system will be established for the entire territory of the Upper Vardar Basin. These activities will include expanding the geographical scope of the hydrological-meteorological stations established on a limited area as part of the UNDP-implemented project funded by the Ministry of Local Self-Government, by including additional meteorological and hydrological monitoring stations. In parallel, the project will work directly with at-risk communities to ensure that residents are aware of the risks they face and the measures to undertake when a warning is given or when flood conditions threaten. Community awareness programs will also include drills and trainings on disaster preparedness and responses that will target specific segments of communities (caregivers, schools, emergency responders, religious institutions, people living in high-risk zones).

Designed in such a manner, the project will provide valuable lessons for a more systemic national level integration of the principles of DRR and integrated flood risk management (e.g., through harmonization with the EU Floods Directive). Earlier activities in this regard have been initiated by the ongoing SDC-funded *Restoration of the Strumica River Basin* project. These processes will continue with the support of both SDC-funded projects, considering the size and complexity of the systemic changes that need to take place to adopt the objectives of the EU Floods Directive. Moreover, close collaboration will be maintained with other ongoing and upcoming EU- and other donor-funded projects pursuing similar objectives.[3] These interventions will entail detailing the institutional set-up model for integrated flood risk management (proposed earlier as part of the Strumica River Basin project), and capacity development support targeting institutions charged with flood management responsibilities (e.g., trainings on key aspects of flood management).

One of the key country-level activities to be supported by the project will be the formulation of an outline of a national strategy and action plan for flood risk mitigation. After piloting the tailor-made flood risk assessment and management planning methodology for the Strumica River Basin, UNDP has been replicating the concept in other priority regions/basins across the country (e.g., City of Skopje with Vodno and Skopska Crna Gora mountains and the Crna Reka River Basin). In addition, there are plans for preparing similar studies/planning documents for the Bregalnica River Basin (UNDP) and Crni Drim River Basin (through the regional project funded by the Adaptation Fund).

Once these documents are completed, the greatest part of country's areas under risk of floods will have been analyzed by applying the earlier developed SDC-funded methodology. After completing a similar planning exercise for the Upper Vardar River Basin, the project will initiate a broad-based process of consolidation and integration of the identified mitigation measures in a preliminary nationwide action plan

[2] While currently there is a division of responsibilities over flood control infrastructure between municipalities (for urban areas) and the water management organizations (outside of urban scope), the infrastructure generally suffers from poor maintenance due to financial and capacity constraints.

[3] UNDP will continue its resource mobilization efforts in support of this resilience building initiative for the region's communities by using as a basis the planning documents and policy guidelines produced under this SDC-funded project. Likely co-funding for the implementation of the Upper Vardar River Basin Management Plan includes central and local government funding, as well as other possible donors interested in complementary interventions.

backed by simple cost-benefit analyses and evaluation of funding possibilities (e.g., national and local budgets, grants, credits and loans). Strategizing future mitigation investments in such a manner will help build an economic case for increased public expenditures in flood prevention, justifying a cost-effective use of increasingly scarce financial resources. The project will explore the possibilities for improving the financing instruments for flood recovery and flood risk mitigation, including improved insurance schemes.

The entire process will be designed as an interactive capacity building exercise that will promote the democratization of the strategic planning process, building knowledge on country-level flooding scenarios/projections and recovery and mitigation priorities among the main responsible institutions. This process is considered as excellent entry point for introducing the principles of Disaster Risk Reduction, which is gaining in international importance, especially considering the Sendai Framework for Disaster Risk Reduction. The goal of this process is not to provide a comprehensive flood management master plan with site-specific interventions across the entire country (due to financial and time constraints), but rather to present a general economic case for country-level flood risk mitigation along with investment priorities and an analysis of funding sources. This process will be also utilized to improve the coordination and cooperation of the government entities on central and local level with responsibilities for flood risk management and disaster risk reduction, as well as to improve the donor coordination. For this purpose, a DRR Platform is envisaged to be established. The Platform shell serve as a for a for strategic dialogue on disaster risk reduction and resource mobilization.

In this fashion, in addition to the direct benefits for the Polog Region, the implementation of the project will provide valuable experience, know-how and strategic guidance on risk-based management of floods in a national context.

The project is designed to build upon the experiences from and contribute to ongoing national-level processes – the largest proportion of which are funded by SDC and SECO – to formulate and support the implementation of different management plans for the country's most important river basins.

Considering the geographical coincidence and programmatic complementarity, the project will also create synergies with the SECO-funded solid waste management project in the Polog Region. Besides the obvious environmental effects, improving waste management in the region will help reduce a serious flood-related threat to communities. Preventing the creation of illegal dumpsites in and around torrential streams will improve their discharge capacity and reduce the even more harmful debris flow that has proven to be one of the reasons for human fatalities caused by the August 2015 flash flood. The objectives of the SECO project will be taken into consideration in the flood risk assessments and prioritization of measures to multiply effects.

The project will also have gender co-benefits and will embed appropriate gender consideration in relevant project activities. The CO has developed an Action Plan for Gender Equality with clear commitment to ensure that gender issues are mainstreaming throughout the different outputs and activities of the UNDP implemented projects and that gender equality is prominently taken into consideration in project design and implementation.

The project will be implemented by UNDP, in close cooperation with all key stakeholders (including the Ministry of Environment and Physical Planning, local self-governments of basin municipalities, the Hydro-Meteorological Service, the Water Management Organization, the Crisis Management Centre, the Directorate for Protection and Rescue , the affected communities, and the Center for Development of the Polog Planning Region). Aiming at building local capacities for implementation of similar initiatives, the project will also rely on locally recruited personnel to be based in one or two of the bigger municipalities of the region (Tetovo and Gostivar).

Recognizing the power of communications, stakeholder outreach and access to international best practices, the project will consistently work on promoting results, raising awareness and partaking in the international/regional networks of knowledge on flood risk and river basin management. The project will support a local and national-level campaign on flood phenomena, causes, management responses and responsibilities of different institutions and communities. Considering the nature of the project interventions, the project will connect stakeholders with relevant Swiss partners (e.g., Swiss institutions, research and educational organization, professionals and experts working on DRR, flood risk management,

regulation of torrential streams, early warning systems and insurance), and take part in Swiss-funded initiatives dealing with such topics.

Considering the size of the necessary investments the project will remain open to new funds from donors concerned to improve flood prevention in the Polog Region.

The time and cost extension of the SDC funded component of the project is based on the achievement of the SDC-funded activities so far, as well as the existing and ongoing analyses and priority investment actions identified and detailed in the comprehensive planning and technical documentation. More specifically, they prioritize investments in further improving the overall preparedness (including the operationalization of the early warning system), as well as implementing targeted risk mitigation/resilience building measures outside of urban scope. These include investments in different sediment management options for which the necessary technical documentation is either available or is under preparation.

To further strengthen the overall sustainability prospects of the achievements, the appropriate share of the additional funding will target further capacity building of municipalities and other institutions charged with flood risk management/resilience building responsibilities. This will be achieved, among the other, through supplementary capacity development of the inter-municipal cooperation mechanism that has been prototyped to address the differences in capacities of municipalities and the need of combining resources beyond municipal boundaries for better response to the challenges. Moreover, the project will seek to further enhance the role of the inter-municipal cooperation mechanism in the identification, prioritization, selection, and implementation of the ongoing measures. This will be carried out as part of a plan for transition of risk mitigation action from the current UNDP-backed implementation approach to a more self-governing system to be institutionalized toward the end of the project at the end of 2023. The project transition plan shall list the tasks and activities that are required to transition the project from UNDP to one or more national entities, and the timeline. It will also integrate capacity development for the respective entities, and risk mitigation activities to ensure smooth transition. The Transition Plan shall also refer to the responsibilities of respective national entities which have to ensure the implementation of the Flood Risk Management Plan for the Upper Varder River Basin.

Besides the budgetary increase, the proposed interventions within the project substantive revision require extension of implementation period for additional 22 months starting from 1 March 2022 to 31 December 2023. This will enable harmonization of the implementation periods between the SDC and SECO components. More importantly, it will increase the adaptive capacity and flexibility in the project design in response to the delays caused by the protracted COVID-19 crisis, the dynamics of the political changes, and bureaucratic procedures.

The substantive project revision is in line with the existing project intervention logic/design so there is no need for intervention in the existing result areas (Outcomes/Outputs) and only the logical framework and some of the indicators of the logical framework are revised/updated.

No major changes in the management arrangements are foreseen and the project will be implemented by the existing management structure already embedded in the Project Document.

The results and the remaining recommendations for measures beyond the extended lifespan of the project will be incorporated in the Flood Risk Management Plan as the key planning instrument prioritizing future risk mitigation/resilience building measures and actions in Polog.

Toward the end of the project, the FRMP for the Upper Vardar River Basin will be revised to provide an adequate planning base for future flood risk mitigation priorities, as well as ensuring sustainability of the project achievements. This exercise will also be used to review overall project progress and document and share the main results and lessons learned together with the main project partners and beneficiaries – the Ministry of Environment and Physical Planning, local self-governments of the Polog municipalities, Crisis Management Centre, the Directorate for Rescue and Protection and the Resilient Polog Network.

The project contributes to the two programming cycles of the UNDP Country Programme and the UN Sustainable Development Cooperation Framework, 2016 -2020 and 2021-2025 through interventions that will increase the resilience of local communities in the Polog region, strengthen capacities at central and local levels to identify multi-hazard risks and to plan, finance and implement effective disaster risk reduction and response measures.

III. RESULTS AND PARTNERSHIPS

Overall Goal and Expected Development Change

The resilience of Polog Region's communities to flood risk is improved, contributing to sustainable and inclusive growth

Outcome 1 SECO

Authorities and communities have an improved understanding of flood risks in the Polog Region and the capacity to manage them in an informed manner

Output 1.1

A Flood Risk Management Plan for the Polog region is established in accordance with the EU Floods Directive and DRR principles

This output encompasses comprehensive participatory flood risk management planning and prioritization of implementation measures. Emphasis will be placed on creating incentives for transforming the current ad-hoc responses and reactive approaches to flood events applied by individual municipalities into a collaborative, basin-scale system of flood risk governance. The planning and prioritization process will be carried out in a highly participatory environment through the involvement of multiple stakeholders, including the most vulnerable communities and social groups.

This Output encompasses activities for continued update of the FRMP, and the interrelated mapping exercises and feasibility assessments that will continue to enrich the existing planning base, ensuring better quality investment decisions. More specifically, FRMP will be kept up to date by: a) new findings of project-backed research (e.g., more accurate digital terrain model, detailed erosion and landslide hazard and flood mapping); b) changes in the legal and institutional setting which are expected to happen during project implementation; and c) progress toward achieving FRMP goals as a result of project-funded and other complementary activities.

Such approach will enable FRMP to remain the most important planning document informing future flood risk mitigation interventions, as well as mainstreaming DRR priorities into region's development plans. Local self-governments of the Polog region together with the respective Water Organizations will be responsible for the implementation of the FRMP, in close collaboration and coordination with the Ministry of Environment and Physical Planning.

Activity 1.1.1 Formulation of a flood risk management planning base

A Flood Risk Management Plan for the entire Upper Vardar River Basin will be prepared in line with the requirements of the EU Floods Directive and the DRR principles, and through a collaborative multi-stakeholder risk assessment and investment prioritization effort. For this purpose, the flood risk management planning methodology developed earlier as part of SDC's *Restoration of the Strumica River Basin* project will be enhanced to further refine the analysis and accuracy of site-specific proposed mitigation measures. It will include specific data on exposure and vulnerability of critical infrastructure, and disaggregated demographic and social data (e.g., proportion of women, men and children; ethnic structure, including Roma; people with disabilities and other vulnerable groups in the high-risk areas), generating in this way site-specific interventions that will address the key threats to sustainable development from floods, vulnerabilities and inequalities among affected social groups.

The necessary data will be provided through multiple sources at national and local levels and will be complemented by baseline analysis (including targeted field surveys to better understand the structure and vulnerabilities of specific social groups, and structural stability of at-risk infrastructure). Data on special vulnerability can be provided by the relevant sectors of municipalities, local centers for social welfare, the Ministry of Labour and Social Policy, and others. Local CSOs/NGOs representing the interests of different social groups (women, Roma, people with disabilities) and dealing with social issues will be included in the planning efforts and in conducting surveys among local communities.

As part of this activity, the project will facilitate establishing a stakeholder participation mechanism to serve as a platform for multi-stakeholder participation in the planning effort. The preparation of the plan is expected to be a collective effort of multiple institutions and other stakeholders that will support data collection, knowledge sharing, prioritization support, trust building and mobilization for the implementation stages of the programme.

The FRMP will consider the effects of climate change on future floods. For this purpose, the latest regional climate change models will be downscaled for the Upper Vardar River Basin to better assess the changes in the magnitude and frequency of flooding and formulate specific climate-sensitive measures (e.g., adjusted design standards for flood control structures to accommodate increased discharges; and more cautious urban development that considers an anticipated increase in the frequency and intensity of torrential rainfall).

In line with the latest trends in flood risk and river basin management, as well as the Eco-DRR principles, the modelling work will help assess the relative significance of various ecosystem-based solutions in reducing flood risks (e.g., use of retention areas, floodplain management, improvement of the basin's structure to stabilize the hydrological regime and river restoration).

The different possible flood/sediment control options will be compared and assessed for their feasibility from a financial, environmental and operational and maintenance perspective. The most suitable options will be included in a comprehensive basin-scale program of measures that will aim to inform future investment decisions by government agencies, municipalities and donors. The process will result in a detailed typology of interventions and a toolbox that can be used for similar future planning efforts across the country.

High resolution Digital Terrain Model for the Upper Vardar River Basin

As part of this activity, the project will commission preparation of digital terrain model (DTM) with the highest possible accuracy. Such high resolution DTM will not only make the future flood risk assessment more accurate but will also provide foundation for a number of other important analyses and plans (e.g., general and detailed urban plans, infrastructure planning, water management, erosion modeling and control, landslide hazard and risk maps, urban runoff management studies, land-use planning, environmental impact assessment, natural resource management).

Such DTM can be prepared by the so-called LiDAR surveying method (Light Detection and Ranging), which can produce 3D representation of the land surface based on the use of laser light emitters and sensors mounted on drones or other types of aircraft. Such high spatial resolution is particularly needed for areas like Polog characterized by steep terrain slopes and highly developed urban areas (e.g., urban centers of Tetovo and Gostivar). The results of this work will feed into all Outputs of Outcomes 1, 2, and 3.

Update of the existing erosion map for the region

The current erosion map for the entire country (including the Upper Vardar River Basin) dates back to 1993. The rapid changes in the forest cover (and other land-uses) and the related erosion processes make this map out-of-date that is inhibiting better management responses when it comes to erosion control. Also, the resolution of the current erosion map is insufficient to distinguish high intensity processes occurring on small sized areas, which are specific for the region.

The process of development of the erosion map would combine field work with aerial/satellite imagery in GIS environment. The updated map will provide clearer picture where the most intensive erosion processes actually occur so that more informed management actions are designed. The map will provide basis for formulating measures under Outcome 3 that will target the most critical areas, maximizing by this the erosion control benefits in a situation of limited availability of funds (cost-efficiency). The erosion map will secure important foundation for carrying out feasibility assessments of forest cover, and torrential flooding management options. Region's forest management plans (prepared by the Public Forest Enterprise) will rely on information derived from the map in prioritizing future erosion control/forest regeneration activities. This is of particular importance for the region considering the extremely high forest cover loss rates and the subsequent effects on hydrological/flooding regimes and sediment transport processes.

Landslide hazard and risk mapping

Landslides are a serious geologic hazard common for the mountainous parts of the Upper Vardar River Basin. FRMP used a combined methodology for evaluation of the landslide susceptibility (Preliminary Landslide Hazard Map). The resulting map was validated by using existing inventory of identified landslides and landslides from geological maps.

However, these findings are only preliminary and cannot be used with high degree of certainty for the future land-use planning and landslide stabilization measures. At the same time, as development continues to take place in the region's mountainous areas, it is important to understand the nature of its potential exposure to landslide hazards.

Although the physical causes of many landslides cannot be removed, geologic investigations, good engineering practices, and effective enforcement of land-use management regulations can reduce landslide risks. It is also important to understand the science of landslides – their causes, movement characteristics, soil properties, the geology associated with them, and where they are likely to occur.

The proposed study will not only provide opportunity for the validation of the preliminary landslide hazard map, but will also provide answer the following key questions: a) where and when will landslides occur; b) how big will they be; and c) how fast and how far will landslides move, i.e. to what extent people and economy can be affected. Based on these findings the study will propose and prioritize measures to reduce the risk of landslides (e.g., through physical interventions, and improved planning) and will provide guidelines for construction and infrastructure which will reduce the costs of living with landslides.

Part of the study will be economic analyses focusing on the feasibility of proposed interventions. This will enable the project to choose demonstration interventions which can be implemented as part of Outcome 3.

Output 1.2

Authorities are equipped with new knowledge to mainstream flood risk mitigation and DRR priorities in future municipal urban and other development plans

Wishing to initiate the transformation of urban planning practices toward more risk-based approaches, under this output, the project will provide capacity development support to relevant institutions through selected case studies from the region. This on-the-job training exercise will help stakeholders understand the long-term socio-economic and environmental implications of different types of urban development. As part of this work the project will produce guidance documents for future use by the institutions charged with urban planning responsibilities. The project will also support the harmonization of the existing municipal flood defense plans with the objectives of the newly developed Flood Risk Management Plan for the Upper Vardar River Basin.

Activity 1.2.1 Mainstreaming DRR/flood risk management into urban and other development plans at local level

The project will seek to make progress in 'institutionalizing' flood risk management by mainstreaming it into different development plans (e.g., urban, tourism, economic, environmental). Emphasis will be placed on providing on-the-job training in developing risk-sensitive urban plans for selected communities of municipalities in the basin (e.g. Municipality of Tetovo).

The planning process will produce numerous flood hazard and flood risk maps, as well as specific urban resilience action plans for the region's municipalities with multiple possible applications. Using this foundation will be instrumental in mainstreaming DRR and flood risk mitigation objectives into the local development agenda. Through interactive training programs and real-life case studies for selected Polog communities, the project will support the preparation of risk-based urban plans, coupled with economic analyses that will show the gains and losses (economic and environmental) of different urban development scenarios in areas at high risk of flooding. The improved understanding of the negative externalities associated with currently applied urban development approaches resulting in high threats to people and assets is expected to initiate a longer-term transformation toward risk-sensitive and environmentally friendlier urban planning.

Since the adoption and implementation of urban plans in general is far beyond the scope and influence of the project, emphasis will be placed on training, providing guidance for integration of flood risk assessments into the planning effort and providing analyses of a few case studies. The guidance documents developed under the project will have national-level importance, as they will be country's pioneer attempts of this kind. The project will rely on relevant Swiss and EU experiences given the limited previous relevant expertise in the country.

As part of this activity, the municipalities will be supported to revise the existing municipal operative flood defense plans in line with the findings and objectives of the FRMP. This will help them comply with their legal responsibilities and decentralized flood control functions. Considering the limited experience and expertise in this area, and the lack of a consolidated national-level methodology for development of these municipal operative flood defense plans, project support will be crucial in establishing a model with a great country-wide replication potential. Municipalities tend to develop these plans without sufficient understanding of the upstream-downstream relations in flood management, which often leads to a situation in which the measures taken on the territory of one upstream municipality increase the flood risk in downstream communities. Based on the case studies from the Polog Region, the project will propose a methodology to be used by municipalities for preparation of such plans in line with basin-scale flood risk mitigation priorities.

NO CHANGES UNDER THIS OUTCOME/OUTPUS UNDER THE SUBSTANTIVE PROJECT REVISION

Outcome 2 SDC

Disaster preparedness of institutions and communities in the Polog region for effective response, recovery, rehabilitation and reconstruction is enhanced

Output 2.1

Functional long-term floods early warning system for the Polog region is established

This output incorporates all activities necessary to introduce an integrated flashflood early-warning and public-alert system for the Upper Vardar/Polog Region – ranging from the re-activation and upgrade of the meteorological and hydrological monitoring network to developing and testing protocols for rapid response to possible future flash floods. The experience of the August 2015 floods shows that in case of heavier rainfall in the Polog Region life-threatening situations develop within minutes or even seconds. Therefore, comprehensive monitoring of such meteorological and hydrological developments must be linked to a preparedness system aiming primarily at saving lives and mobile property.

Activity 2.1.1 Re-activation and upgrade of the meteorological and hydrological monitoring system and operationalizing a flash-flood early warning and public alert system

As part of this activity, the project will help expand the UNDP-backed meteorological and hydrological monitoring network that is being reactivated in those parts of the Polog Region that were the most affected by the 2015 floods. The upgraded system will cover the entire territory of the Upper Vardar River Basin, providing timely information on possible flood events for all communities at risk.

For this purpose, the project will re-activate and upgrade the system of meteorological and hydrological stations as the key elements of a flash-flood early warning and public-alert system. This will include restoring existing stations (most of which have been out of operation since the early 2000s) and introducing new monitoring sites.

The early warning system will be established in cooperation with the Hydro-meteorological Service (HMS) and other responsible institutions (eg. Crisis Management Centre, Directorate for Rescue and Protection). Investing in the capacity development of the HMS is the key to ensuring the longevity of the monitoring system. For this reason, this activity will build on a longer-term partnership with HMS to improve monitoring systems across the country's river basins in line with contemporary EU standards (already in place in the Strumica River Basin and the Prespa region and the Macedonian part of the Drini River Basin).

In parallel to efforts to upgrade the monitoring system in the Polog Region, the project will work on developing and testing protocols that will encompass all measures that need to be undertaken when a warning is given for a potentially harmful flood event (e.g., through the trainings and cmcs covered under Output 2.2). The system will be co-designed through the involvement of the affected communities to identify a workable localized solution and avoid all possible barriers to effective response to potential crisis situations.

Once introduced, this will become country's first integrated flash flood early-warning and public-alert system. The lessons learned from the effort will be systematized and widely shared in support to country's efforts to improve flood preparedness in other regions facing similar challenges (e.g., Skopje suburbs affected recently by a major flash flood that caused 23 deaths).

Hydro-meteorological monitoring network

FRMP analysed in-depth the status of existing hydro-meteorological monitoring vis-à-vis the actual needs on the basis of the latest studies into meteorological and hydrological processes, as well as flood risk assessments. The Plan suggests full re-activation and an upgrade of the monitoring system by applying phased approach, so as to give the responsible institutions time to adapt to the increased demand for operation and maintenance. The approach is tailored based on consultations with the national monitoring authorities (Hydrometeorological Service), taking into consideration their current capacities and future development plans.

The Plan anticipates putting into operation and automating one climatological station, ten rainfall stations, and ten hydrological stations (two of which will act as flood alarm stations) as an optimal monitoring solution. It also suggests re-activation of a Doppler weather radar which will enable real time observation of clouds formation and more accurate forecasts of flood events.

Besides the possibility of introducing a viable early warning system for floods for the Polog region, the monitoring network will have direct positive effects on flood forecast for the downstream Skopje region. This will provide additional incentives to the responsible authorities to ensure longevity of the system. A comprehensive economic analysis conducted as part of FRMP revealed very positive benefit-to-cost ratios for the improved monitoring/early warning system ranging between 5.4 (only for Upper Vardar River Basin) and 15 (by adding downstream areas in Skopje). The DRR Platform shall be used to facilitate the dialogue about the reforms needed to ensure sustainability of the hydrological and meteorological network on national level.

Output 2.2

Flood disaster response capacity is improved through public awareness campaigns on early warning system and inclusive drills

As part of the project a local and national-level campaign will be designed and implemented to improve overall awareness of the occurrence of floods, the causes, the management responses and roles of different institutions. It will focus on the key preconditions and benefits of introducing early-warning and public-alert systems for different types of floods, including flashfloods that are typical for the Polog Region. In this way, the activity will help create the enabling environment for the institutionalization of the early warning system, including the facilitation of cooperation between different responsible institutions that need to be part of the system (NOTE: the earlier lack of inter-agency communication and lack of clarity on the division of responsibilities in emergency situations led to tragic consequences in the recent floods). In addition, the project will support the design and testing of different plans of actions in emergency situations, facilitating collaborative efforts among multiple institutions and at-risk communities.

Activity 2.2.1 Conducting a nation-wide public awareness campaign on flood risk management, flood preparedness and early warning systems

In order to facilitate the wide acceptance of the new flood risk management approaches, including community readiness and response to flood events, and the benefits of functional early warning systems, the project will conduct an innovative, nation-wide campaign. The campaign will build upon the achievements of the program and will be closely linked to the activities for strategizing national level

response to the growing flood risks (Activity 4.1.2) and promoting changes in the legal and institutional setting (Activity 4.1.1). It is expected that at the end of the project different interest groups will be more aware of the flood risks they face and the steps that they can take to reduce these risks. Moreover, the campaign shall also contribute to keep flooding in the national consciousness, ensure people understand the impact of flooding on socio-economic development on community/municipal/regional and national levels, make flooding relevant to everyone who is at risk, and shall encourage action by individuals and respective institutions.

Activity 2.2.2 Community capacity-building on flood preparedness, response and early-warning system for the Polog Region

Wishing to increase the capacity of communities for better preparedness to emergency situations and natural disasters (mainly floods), this activity includes drills and trainings. Based on a careful study of the existing flood preparedness of the population and specific segments of communities (e.g., caregivers, schools, emergency responders, religious institutions), the project will propose plans of action for quick response and coordination mechanisms among different social actors.

In cooperation with the mandated institutions (the Crisis Management Center, the Protection and Rescue Directorate), the project will prepare training programs and will explore the needs and opportunities for involving volunteers who would assist in responding to future emergency situations. These trainings will be delivered to the relevant stakeholders and will also include drills and securing the necessary basic equipment for the key contributors to higher preparedness and better capacity to cope with post-disaster situations.

In this way, the project will help increase the capacity of institutions and the overall resilience of communities at risk to future floods. These capacity building efforts will be designed to take into consideration all proposed systemic changes and newly introduced systems as part of the project (e.g., the early-warning and public-alert system).

As part of this Activity, the project will assist the institutions of the emergency response system to prepare emergency action plans that will be aligned with the flood risk assessments and the likely future flooding scenarios for the zones of high risk. Special attention will be paid to the parts where permanent protection doesn't exist or is unfeasible (e.g., because of limited available space). Responsible institutions will be provided with and trained to use mobile flood barriers. Such solution will satisfy two important requirements: rapid protection in case of flooding and open access to the floodplain over the remaining time. Project-backed analyses will show if such systems can be used to provide a longer-term flood protection, and not only protection in emergency situations.

SUBSTANTIVE REVISION

COMPLETED ACTIVITIES/ACHIEVED RESULTS UNDER THIS OUTCOME WITHIN THE SDC COMPONENT BY FEBRUARY 2022

- A study "Improving Preparedness to Floods and Other Priority Hazards in the Upper Vardar River Basin" has been developed. The study provides an overview of the preparedness capacities and needs in the Polog region and provides recommendations for actions and measures to improve overall preparedness for flood risk and other related geohazards mitigation and response. Moreover, this study serves as a starting point for the design of a flood early warning and public alert system, and conceptualization of capacity development measures aimed to increase the coping capacities of responsible institutions at local level and at-risk communities and contributes to awareness raising and community/stakeholder mobilization based on the co-designed overall preparedness plan for the region. The finalization of the study was delayed which resulted in the delay of the development of preparedness action plans for the municipalities of the Polog region
- The initial concept for the early warning system was presented at the meeting of the Resilient Polog Network. The concept has to be also presented to other relevant entities of the national disaster risk/crisis management system (e.g. Crisis Management Centre, Directorate for Rescue and

protection) for their feedback. The final concept shall incorporate the input from all relevant stakeholders and will be operationalized and piloted in the extended phase of the project.

- Based on earlier analysis of the status of existing hydro-meteorological monitoring network, the project supported the Hydro-meteorological Service (HMS) to operationalize an optimized multi-purpose monitoring system. Total of 31 meteorological and hydrological stations were purchased and installed in the Polog region and handed over to the HydroMet Service, including spare parts for the stations. The extended hydrological and meteorological network in the region, will provide for building an accurate monitoring database and access to real-time data, which will be utilized as part of the early warning system.
- Another important study completed under this Output is the Feasibility study on basin-scale sediment management options for the Upper Vardar River Basin. The study analyses possible sources of sediments (e.g. linear erosion processes, landslides), by combining relevant complementary methodologies and models and developing event-based scenarios with different probabilities. The aim is to identify the risks and to prioritize areas where sediment sources/processes need to be addressed and managed in a way to mitigate risks to acceptable levels. For the first time in the country, the analyses have applied the InSAR (Interferometric Synthetic Aperture Radar) methodology which provides a better understanding of the longer-term landscape/soil layer movements which may result in different hazardous situations (e.g., landslides, rockfalls). Considering the scale of potential threats from flooding and sediment transport processes, the study identified 20 prioritized locations for the implementation of measures.
- Based on the finding in the sediment study and the necessity for river basin management and forest protection, a Feasibility assessment of alternative heating and energy efficiency options for firewood-heated households in the Polog region was prepared and two projects were implemented in the municipalities of Tetovo and Gostivar.
- Considering the improved understanding of potential of green infrastructure (or combination of green and grey infrastructure), an Urban Run-off Study was prepared for the densest urban parts of the cities of Tetovo and Gostivar. The study analysed the possibilities of reducing urban flooding through such measures as detention and retention ponds, rainwater harvesting, green roofs, infiltration areas, constructed wetlands, pervious pavements, by also taking into consideration the given spatial limitations imposed by the current land-use/urban plans. The Run-off Study was translated in Macedonian and Albanian and shared with the municipalities of Tetovo and Gostivar Initial discussions were held with the local governments/Mayors about the possible actions and measures which can be supported by the project and/or by own funds of the local governments. The discussion shall continue, including with the Network for resilient Polog.
- The studies mentioned above, are the first of a kind for the country and are considered particularly important for the desired approach for an integrated flood risk management on local level.
- In the effort to increase the resilience and preparedness of the municipalities to respond during the floods, the project provided machinery such as excavators, backhoe loaders and combined backhoe loaders in all Polog municipalities that will be used to prevent floods by maintaining the riverbeds and other areas clean. Such mechanization could be also used in the recovery phase after any disaster.

ACTIVITIES TO BE IMPLEMENTED BY THE END OF 2023 UNDER THE SDC COMPONENT

The following activities shall be implemented by the end of the project under the SDC funded outputs:

- Developing a plan of activities for improving preparedness and establishing of an Early Warning System;
- Updating the functional analysis of the responsible institutions (relevant departments of the local governments, branches of the Crisis Management Centre and Directorate for Protection and Rescue, Water Management Organization) considering the preparedness system requirements, followed by capacity development support (e.g., on-the-job trainings, drills);

- Operationalization of the Early Warning System for the Polog region through targeted investments and capacity development support (e.g., on-the-job trainings);
- Operationalization of the intermunicipal cooperation mechanism for flood risk management on local/regional level, and carrying out activities for strengthening the capacity of the inter-municipal cooperation body;
- Developing guidance documents, knowledge products and lesson learnt;
- Incorporating the findings and recommendations from relevant projects studies into updated municipal protection and rescue plans.
- Testing and upgrading the Standard Operating Procedures and protocols for emergency response as needed;
- Providing necessary resources to improve coping capacity of the institutions in-charge (e.g., equipment, material);
- Conducting public awareness campaign at national and local level.

Outcome 3 SECO & SDC

Priority flood risk mitigation measures informed by international best practices are implemented to effectively reduce future risks in the Polog region

Based on the priorities identified throughout the flood risk management planning process (Output 1.1), the activities under this Outcome will demonstrate contemporary flood risk mitigation and urban resilience building approaches (e.g., as applied in Switzerland and EU countries facing similar challenges to the Polog Region and include the implementation of a selected set of priority actions combining state-of-the-art flood risk mitigation investments and measures to enhance urban resilience (Output 3.1 funded by SECO) and ecosystem-based interventions (Output 3.2 funded by SDC) to protect vulnerable rural communities exposed to flood risks and to prevent the generation of floods in remote/mountainous areas . A prior partner contribution process will ensure contributions by central and local governments to enhance the impact of the program and ensure sustainability of the achievements.

FRMP provides possibility for risk-based prioritization of mitigation actions in different contexts (urban, rural/mountainous, watershed-scale interventions). The improved understanding of the risk distribution will enable the project to target areas that will be part of subsequent feasibility studies aiming to identify the most suitable measures, and design processes detailing the interventions prior to their physical intervention.

While this Outcome contains relatively distinctive measures for urban (SECO funded) and non-urban (SDC funded) setting, it also encompasses basin-scale interventions which are important for urban resilience and risk mitigation in remote mountainous communities. These include forest cover management, and landslide/debris flow/dumpsite management interventions. As a result, as part of this Outcome specific measures will be implemented with combined SECO and SDC funding, mindful of their specific/relative importance to the SECO and SDC priorities. The landslide/debris flow/dumpsite management measures will be conceptualized as part of different studies (e.g., erosion mapping, landslide hazard and risk mapping described under Outcome 1). The forest cover management measures will be implemented under under SDC's Output 3.2.

Considering the differences in maturity of suggested interventions, the project will adopt a phased approach to their implementation. Namely, the more complicated cases where there are alternatives will be grouped for additional feasibility assessments backed by field investigations, and supplementary data collection and analysis. These analyses will help identify more sustainable mitigation options and provide basis for preparation of extensive technical documentation which can be used both by the project and for informing future investment decisions. Project's main funding decisions will be made at later stages once the feasibility studies and the key technical documentation are completed. This will help keep the financial risks low in comparison to making such decisions only based on FRMP's preliminary assessments.

However, recognizing the need to keep the momentum around the project, and to maintain the stakeholder dialogue process alive, the project was able to identify several mature measures to be implemented in the early stages. These mostly include demonstration interventions which will provide examples to be replicated in future (e.g., elements of the green infrastructure such as green roofs on selected public buildings, building permeable parking lots, flood proofing of critical infrastructure in high-risk zones, stabilization of important landslides, improving discharge capacity of selected critical bridges, torrents control in places severely affected by recent floods). For all these interventions the FRMP provides sufficient level of information to move on to the design and implementation stages.

Very importantly, such an approach will incentivize the ongoing resource mobilization efforts at national and local levels, raising by this the overall funding to support high-impact long-term risk mitigation successes.

Output 3.1 SECO

Urban resilience is improved through implementation of priority state-of-the-art flood risk mitigation measures

Activity 3.1.1 Design and implementation of priority urban resilience building measures

This activity will focus on the design and implementation of specific measures mostly in the highly urbanized parts of the region. In line with contemporary urban resilience science and practice, the project will place emphasis on introducing such measures as detention and retention ponds, rainwater harvesting, green roofs, infiltration areas, constructed wetlands, pervious pavements, as well as redefined/improved design standards for urban drainage systems where no other solutions can be applied (e.g., by taking into account current and likely future floods, as a climate change adaptation measure). Moreover, the detailed study into the effects of urbanization and climate change on hydrological regimes and runoff patterns, will provide guidance to local authorities on improved design standards they need to apply when introducing flood control systems in the future.

As an outcome of this work each municipality will receive an urban resilience action plan aligned with the FRMP and the latest approaches to urban flood management. During the planning process, possibilities of securing funds from different sources will be explored, including the local contribution to support implementation of priority measures.

As part of this activity, the project will provide direct support to the necessary post-disaster recovery efforts for Polog that will be guided by 'build back better' principles and enhanced resilience objectives.

Priority will be given to those measures that would help address the growing challenge of pluvial flooding in an urban context due to the uncontrolled urbanization and conversion of natural land for different development purposes. Considering the pioneering character of this kind of approach for the country and the wider region, it is expected to provide excellent examples with huge replication potential. The beneficiary municipalities (e.g., the largest urban centers such as Tetovo and Gostivar, and other municipalities facing rapid urbanization) will be supported to shift their current urban flood control practices to more contemporary management approaches by mainstreaming the concept into their urban and other development plans.

Upon finalization of the infrastructure recovery/development measures, the respective infrastructure will be commissioned and handed over to the relevant national/local authorities for future use and maintenance (e.g., municipalities or the water management organization depending on their legal mandate). For this purpose, even in the project identification stages the respective institutions should demonstrate the readiness, capacity and access to financial resources to maintain the infrastructure. The project will provide an analysis of the annual operation and maintenance costs of the infrastructure necessary to ensure the durability of the infrastructure and its optimal performance in reducing flood risks.

Urban River Regulation

FRMP identified the most critical river sections in the basin when it comes to flood risk for which there are limited management options (e.g., limitations imposed by urbanization in the floodplains/river corridors). These interventions are considered the highest priority for the authorities considering the magnitude of existing risks. At the same time, these are among the most investment-heavy measures.

In order to better strategize SECO investments in river regulations, the project intends to carry out feasibility comparison of possible technical solutions for the critical river courses/sections identified by FRMP for which no technical documentation is available (e.g., river sections downstream Gostivar). Once suitable solutions are conceptualized, the project will support preparation of detailed technical documentation. In parallel, the project will support review and adjustment (if deemed necessary) of the existing technical documentation (e.g., Tetovo, Jegunovce and Bogovinje-Brvenica).

Once the entire technical documentation is complete and the level of available co-funding from other source is determined, the project will be able to make more informed decisions about possible investments in river regulations. Priority will be given to areas under higher risk (higher benefit-to-cost ratio) and opportunities for matching funds in order to maximize risk reduction benefits. Even for the measures that cannot be funded by SECO, the project will leave considerable amount of technical documentation that will guide future investments by national authorities and/or other donors.

To the extent possible, new river engineering design will be aligned with the ecosystem management priorities, considering the limitations of the urban setting. Moreover, river flood control design will take into account the effects of climate change expressed by increase in rainfall intensity, and the land-use changes caused by rapid urbanization. Such climate change adaptation measure are likely to require change in the design parameters for the flood control structures that will be backed by adequate economic analyses.

Urban runoff management

The preliminary analyses carried out as part of the FRMP prove the correlation between urban development and flooding caused by excess urban runoff. Current urbanization rates cause increase of rainfall-runoff peak discharges in relation to the conversation of natural permeable surfaces with artificial impermeable structures. For selected parts of the urban agglomerations (e.g., parts of Gostivar facing major urban flooding challenges), FRMP showed how urban runoff can be greatly reduced (e.g., app. 35%) by incorporating green infrastructure (e.g., green roofs, permeable pavements and parking lots). Increasing the percentage of such structures will reduce the discharge peaks that would need to be evacuated by conventional drainage infrastructure (e.g., storm water drainage network).

Considering the improved understanding of potential of green infrastructure for urban runoff management among key stakeholders such as the urban departments of the local governments, public enterprises for green areas management, etc., the project will implement selected set of such interventions in the densest urban parts of the cities of Tetovo and Gostivar (e.g., green roofs on selected public buildings, and permeable parking lots). Such demonstration projects will provide examples backed by design guidance and parameters that can be further applied by the authorities. These measures are expected to continue gaining on popularity having in mind the associated multiple social, economic and environmental benefits.

In order to bring to scale long-term solutions for urban runoff management for the Basin's urban agglomerations, the project will support targeted studies based on sophisticated, high-precision modelling. The DTM developed by LiDAR surveying will be an excellent input to these analyses. The studies will reveal the optimal investment path for greening the cities toward higher resilience to floods and other urbanization challenges.

Once the possibility and physical limitations of the green infrastructure are understood in-depth, the studies for Tetovo and Gostivar will propose optimal solution for draining the excess runoff which cannot be stored, especially for the urban parts with high value infrastructure. Such technical solutions are of great importance for both urban centers as urban runoff is mostly drained through combined sewer overflows posing major environmental risks and economic consequences.

All these analyses will enable the project to prioritize possible investments in order to accelerate transformation from the current to the optimal land-use structure. Moreover, the studies for Tetovo and Gostivar will provide invaluable input for the preparation of respective urban plans (please see Output 1.2/Activity 1.2.1).

Flood Proofing of Critical Infrastructure

The new FRMP helped identify the critical infrastructure located in the high-risk zones along the main analysed water courses. Such critical infrastructure (e.g., hospitals, schools, factories) is especially present in the two major urban centers of the region – Tetovo and Gostivar. Considering the current and likely future levels of protection in these flood risk zones the project will design and implement flood proofing options for selected set of public buildings.

The flood proofing will help make the buildings resistant to flood related damages either by taking them out of contact with floodwaters or by making them resistant to any potential damage resulting from contact with floodwaters. This can be accomplished by sealing the buildings to prevent floodwaters from entering it. These demonstration interventions will include variety of flood proofing options such as installation of watertight shields for windows and doors; use of sealants and membranes to reduce seepage of floodwaters through walls; reinforcement of walls to withstand the pressures from floodwaters.

These interventions will be the first of this kind country wide. In order to support future replication, the project will produce design guidelines for different applicable types of flood proofing options which can be used at national level.

Output 3.2 SDC

Rural communities have increased resilience to floods through practical application of targeted low-cost nature-based measures

Activity 3.2.1 Design and implementation of priority ecosystem-based flood risk mitigation measures in vulnerable communities and remote flood source areas

Based on the findings and prioritization carried out in the course of the FRMP preparation (Output 1.1), the project will work together with the authorities and local communities in designing and implementing pilot multiple-benefit interventions aligned with the principles of Eco-DRR and Ecosystem-based Adaptation (EbA). This activity will focus on economically deprived areas at high risk of floods and source areas of torrential streams (e.g., remote mountainous areas exposed to the effects of flash floods, and gravitational natural hazards such as mud-flow and landslides) that have virtually no access to financial assistance for larger-scale capital investments in protective measures, nor possibility to maintain sophisticated technological solutions.

Therefore, the activity will focus on flood control infrastructure recovery and development interventions to be designed as demonstration activities, but with certain flood risk mitigation potential. Possible priorities would range from basin-scale measures (e.g., better forest cover, slight terrain modifications) to well managed retention areas to reduce runoff, bioengineering approaches to sediment control. This emphasis on communities having specific vulnerabilities will reduce the unacceptable fatalities to the lowest possible levels, and also address some of the causes of social exclusion.

As part of the selection criteria for infrastructure recovery/development interventions, the project will consider: a) an emphasis on high-risk areas and rural communities groups/communities; b) sustainability prospects (to identify multiple-benefit, low-cost, nature-based solutions, including the use of 'green' infrastructure); e) environmental and social considerations (possibility to generate additional ecosystem benefits, such as biodiversity protection, diversifying habitats, producing biomass); and d) the possibility for demonstration of novel approaches and techniques with replication potential.

The implementation measures under this activity will be aligned with the principles of Eco-DRR and EbA that aim at promoting sustainable management, conservation and restoration of ecosystems to provide services that reduce disaster risk by mitigating hazards and by increasing livelihood resilience.

Torrential flooding mitigation priorities

The risk-based prioritization of torrential flooding for the entire Upper Vardar River Basin carried out as part of FRMP enables the project to make more informed investment decisions for mitigation actions. As a subsequent stage, for the highest priority torrential streams, the project will commission a comprehensive feasibility study that will help conceptualize and compare different mitigation options. A detailed technical documentation on the selected options will provide more accurate estimates on investments needs that will help the project focus on priorities that can fit into available budget from different sources. All interventions

which cannot be realized by the project for different reasons (e.g., financial or time constraints, sustainability risks) will be incorporated in the respective planning documentation that will guide future decision-making.

To the extent possible, the torrential flooding mitigation options will mostly include watershed-scale approaches, nature-based solutions and bioengineering practices. In more extreme cases, combinations of biological and structural measures will also be considered (e.g., small check-dams, large boulders).

As part of this activity, the project will support more mature interventions for which there is significant interests among the local communities and/or major political will (e.g., torrents in the villages of Shipkovica that was hit by the 2015 floods which also caused loss of human lives). Such interventions will serve as demonstration projects, and will help maintain high interest in the project, and improve resource mobilization prospects.

As part of this Activity, the project will support stabilization of priority landslides as demonstration projects. Priority will be placed on multi-purpose alternatives such as the stabilization of the particularly active landslide above the village of Bozovce, Municipality of Tetovo. By capturing the excess water, the project can slow down the movement of this landslide and improve water supply for the village facing with water shortages during summer months. Other similar interventions will be informed by the landslide hazard and risk mapping effort described under Output 1.1.

Forest Cover Management

The Upper Vardar River Basin is facing with a highest annual forest cover loss rate at national level of nearly 5% (app. 50 hectares of forest in a single year). This was found out as part of FRMP through comparison of satellite images of forest cover for different periods and field observations. This has multiple socio-economic and environmental effects, including disturbance of hydrological regime and sediment transport processes, which in turn increases risk of flooding and other associated processes.

Project strategy is to reduce pressures on the forest cover and accelerate its regeneration through: a) reduced demand for firewood through energy efficiency measures; and b) afforestation and re-forestation of priority erosive land;.

The focus of the energy efficiency measures will be on the mountainous rural communities which largely depend on firewood for heating (NOTE: such activities are not planned for the urban centers that normally use other sources of energy for heating such as electricity and gas). The project will partner with the respective rural municipalities to identify the best models for financing energy efficiency that will eventually lead to reduced firewood demand. Likely measures for improved energy efficiency would include: a) use of more efficient stoves; b) change of fuel (e.g., pellets instead of wood, or other renewable energy sources); and c) improved insulation of individual houses.

The model will be defined in a study that will accurately determine the pressure on the forest cover for heating needs, which will also simulate changes in firewood use as a result of different combinations of energy efficiency measures. Based on these analyses, municipalities will be supported to establish long-term financing mechanisms (subsidies) for introduction of energy efficiency measures by residents of priority communities. The study will actually reveal the optimal scenario for improved energy efficiency considering the local climate conditions, availability of energy sources, local culture, and other feasibility factors. Part of the project funding will be used to accelerate the introduction of these measures based on demonstrated multiple positive environmental, economic and DRR effects (e.g., through open calls for expression of interest on a co-funding basis).

When it comes to forest cover regeneration, priority will be placed on areas identified by the detailed erosion mapping (Output 1.2), and solid understanding of the forest ecosystem (e.g., regeneration rates, suitability of different tree species considering the exiting ecological factors), and in-depth economic analyses that will take into account the multitude of beneficial ecosystem services provided by the improved forest cover.

The detailed forest regeneration measures will be incorporated in the Forest Management Plans for the region, providing by this legal basis and financial instrument for their implementation. Based on the long-term forest regeneration needs, and associated investments, the project will explore the viability of producing local planting material in nurseries managed by the responsible Public Forest Enterprise. Based on earlier similar experiences from the Prespa Lake region, this is expected to generate significant savings for the Public Forest Enterprise and stimulate reforestation action.

Finally, the project will support the ongoing national initiative of declaring Shar Planina Mountain (where the highest forest cover loss rates actually occur) as a National Park. This planned designation is expected to enhance enforcement capacity, preventing great part of the illegal logging happening in the region.

This set of measures have already been justified by FRMP for selected parts of the Basin as case studies, through analysis of reduced damages and losses of likely flood events. For example, such analyses carried out for the Sub-basin of Kamenjanska River showed highly favourable benefit-to-cost ratio in the range of 2-3.

SUBSTANTIVE REVISION

COMPLETED ACTIVITIES/ACHIEVED RESULTS UNDER THIS OUTCOME WITHIN THE SDC COMPONENT BY FEBRUARY 2022:

- Based on the Feasibility Assessment and Study on Alternative Heating and Energy Efficiency Options for Firewood-Heated Households in the Polog Region, a total of 80 households in Bogovinje and Tearce were supported with 50% co-funding to replace their unefficient wood stoves and to implement energy efficacy measures.
- Design and implementation of flood proofing options and green roofs for selected set of public buildings in different municipalities, including the construction of a green roof in the kindergarten "Mladost" in Tetovo and Gostivar elementary school.
- The most critical landslides were identified: Jelovjane, Bozovce, Senokos, Germo, Pirok, Staro Selo, Dolna Lesnica and Pena. The development of the technical documentation for their stabilization is underway.

ACTIVITIES TO BE IMPLEMENTED BY THE END OF 2023 UNDER THE SDC COMPONENT

The following activities shall be implemented by the end of the project under the Outcome 3:

- Completion of the technical design for stabilization of 8 priority landslides;
- Stabilization of at least 3 priority landslides;
- Piloting an integrated approach for resolving the Poroj torrent;
- Installation of an irrigation system for the plant nursery in Kumanovo.
- Signing of Memorandum of Understanding with the Public Enterprise "Nacionalni Sumi" (National Forest) for implementation of forest regeneration measures in priority areas that suffer from serious erosion;
- Implementation of energy efficiency measures for replacement of the wood stoves in the Municipality of Vrapciste.

Outcome 4 SECO & SDC

National legal and regulatory framework for disaster risk reduction is improved in line with the Sendai Framework and the EU Floods Directive and risk financing and risk transfer mechanisms are conceptualized

Output 4.1 SDC

National legal and regulatory framework for flood risk management is harmonized with the EU Floods Directive

This Output was introduced to support the systemic integration of the principles of integrated flood risk management into the national system through the adoption of the EU Floods Directive. The adoption and operationalization of the EU Floods Directive – the only piece of EU water-related legislation not yet

incorporated into the national systems – is considered particularly instrumental to creating systemic capacity for preventing similar outcomes of flood events in the future. Both projects were expected to generate proof-of-concept of applying contemporary approaches to flood risk management and DRR whose systemic incorporation will be supported as part of this Output. However, the IPA financed TA faced significant delays and might not be realized.

The Output combines regional/basin-scale and national-level support for introducing an integrated flood risk management system through supporting the adoption of the EU Floods Directive and proposing and supporting the institutional/organizational setup.

Activity 4.1.1 Strengthening the legal and institutional enabling environment for integrated flood risk management

At a national level, this activity will build upon the complementary activities of the SDC-funded *Restoration of the Strumica River Basin* project. Moreover, close collaboration will be maintained with other ongoing and upcoming EU and other donor funded projects pursuing similar objectives. These interventions will entail detailing the institutional set-up model for integrated flood risk management (proposed earlier as part of the Strumica River Basin project), drafting of legislation, designing regulatory instruments at national and local levels, and capacity development support targeting institutions charged with flood management responsibilities (e.g., trainings on the key aspects of flood management).

On a basin scale, recognizing the differences in capacities of municipalities to adopt and apply the principles of integrated flood risk management, the project will work with them to identify proper institutional/administrative setup models. As part of these efforts, different options of inter-municipal cooperation in flood risk management will be explored, considering earlier experiences from delivering other types of services to citizens by sharing resources. This approach will try to replace the existing improper way of managing floods only within the administrative boundaries of individual municipalities, disregarding the basin functions in flood occurrence.

Activity 4.1.2 Outlining a national-level flood risk mitigation strategy and action plan

Under this activity, the project will support the preparation of an outline of a national-level flood risk mitigation strategy. This strategic planning effort will build upon the existing flood risk assessment studies and management plans for priority regions/basins developed over the past years in line with the SDC-funded methodology (e.g., Strumica River Basin, Crna River Basin, City of Skopje with Vodno and Skopska Crna Gora mountains, and Polog). It will also take into consideration the other anticipated similar efforts for Bregalnica and Crni Drim River Basins. All these studies/plans identify area-based mitigation priorities that will be consolidated into an outline of a national-level flood risk management strategy.

This process will help weigh the relative importance of different flood risk mitigation priorities from a central-government perspective and integrate them into a preliminary nation-wide action plan backed by comprehensive cost-benefit analysis and evaluation of funding possibilities (e.g., national and local budgets, grants, credits and loans).

The entire effort is anticipated to provide an important capacity building opportunity for the key institutions charged with different responsibilities in the flood risk management system. The broad involvement of different stakeholders will ensure democratization of the strategic planning process, also instilling improved knowledge on country-level flooding scenarios/projections and recovery and mitigation priorities among the main responsible institutions.

The goal of this process is not to provide a comprehensive flood master plan with site-specific interventions across the entire country (due to financial and time constraints), but rather to present a general economic case for country-level flood risk mitigation along with investment priorities and analysis of funding sources (a more detailed analysis of possible financing options for flood risk mitigation will be included in Output 4.2).

The DRR Platform which will be established by the project shall further improve the strategic planning, coordination and cooperation of the government entities on central and local level with responsibilities for flood risk management and disaster risk reduction, improve the donor coordination in this area and is expected to support mobilize resources.

In this fashion, in addition to the direct benefits for the Polog Region, the implementation of the project will provide valuable experience, know-how and strategic guidance on risk-based management of floods in a national context.

Output 4.2 SECO

Risk financing and risk transfer mechanisms are conceptualized and advocated to become part of the national-level flood risk mitigation strategy

Under this Output the project will place emphasis on conceptualizing and facilitating the introduction of long-term risk financing and risk transfer mechanisms at national, regional (e.g., river basin), and local (e.g., municipal) levels. For this purpose, the project will carry out a comprehensive gap analysis targeting existing financial capacities and instruments vis-à-vis the actual needs based on the improved knowledge about country's overall flood risk situation.

The purpose of this work will be to enable strategizing future risk mitigation investments through increased public expenditures in flood prevention, justifying a cost-effective use of increasingly scarce financial resources. Moreover, on the basis of the comprehensive risk assessments, and understanding mitigation potentials and limitations (i.e. residual risk), the project will support the national stakeholders to carry out comprehensive study into the insurance market development potentials.

As part of this work, the project will consider a full possibility of financial mechanisms for prevention, post-disaster response and risk transfer, aiming to improve the overall ability of institutions, businesses and communities to respond more resiliently to disastrous flood events in future.

The project will take stock of the comprehensive analytical work and general recommendations of other ongoing SECO-funded regional initiatives (e.g., Southeast Europe Catastrophe Risk Insurance Facility) in the design and implementation of specific project activities.

Since this reform is highly dependent on high-level political will and profound understanding among the key policy- and decision makers about current and future risks, the project will facilitate a multifaceted policy dialogue process[4]. This dialogue process is expected to result in broader consensus over the best possible financing options, including use of public funds for mitigation and response, as well as risk transfer options. Stakeholders will be supported to analyse and understand the consequences of inaction (in broader economic terms) which is expected to provide the incentives for accelerated reform process. Part of analyses will target the causes for low penetration of risk transfer schemes, including insurance underdevelopment.

Activity 4.2.1 Carrying out a gap analysis of the financial and institutional capacity for flood risk management

As part of this activity, the project will carry out a multi-stage comprehensive study into current risk financing situation and the likely future scenarios in an event of inaction. Basis for the first stage (preliminary) expert-backed assessment will be the recent comprehensive flood risk assessments carried out country-wide through different UNDP-backed project, largest part of which have been funded by the Government of Switzerland. Based on the current and predicted future risk situation, the key stakeholders will be supported to understand the gap between the current and the optimal funding to bring risk to tolerable levels, and prepare the country for post-disaster situations, considering its economic capacity and vulnerabilities.

The gap analysis will rely on a comprehensive stocktaking exercise targeting relevant analytical work carried out under past and ongoing national and regional level initiatives (e.g. SECO-funded Southeast Europe Catastrophe Risk Insurance Facility). The purpose of such approach will be to make the best use of existing findings and recommendations, in order to be able to carry out an even deeper analysis of the root causes for the slow response of the financial mechanisms to the growing risk-related challenges in the country.

Based on these preliminary gap analyses, stakeholders will be supported to carry out in-depth multi-expert feasibility assessment of different models of financing and institutional arrangements (based on experiences from EU, Switzerland and the neighbouring countries). The optimal financing scenario will be identified

[4] The budget for this Output is proposed based on an assumption of a strong political will for active reforms in the risk financing / risk transfer system in the country. In an event of low response by the key national institutions (e.g., Ministry of Finance) and delays in introducing new legislation, the project will consider re-allocating funds to different outputs (e.g., Output 3.1) which can absorb considerable additional resources.

through comparison of alternatives against a number of feasibility criteria including financial, economic, institutional, and social (including the estimated degree of acceptance of the changes and the corresponding impacts among the key actors in society).

Once the optimal scenario is identified, in the next stage, stakeholders will be supported to gradually institute the new model through legal and institutional reform, as well as comprehensive capacity development assistance (as described under Activity 4.2.2).

The overall purpose of this work will be to facilitate discussions on the ways to increase the financial response capacity of institutions to meet risk mitigation and post-disaster funding needs without compromising fiscal balances and development objectives. The gap analysis will enable more informed decisions on disaster risk finance, based on sound risk assessment and financial analysis.

The work under this activity will pave the way toward identifying the most suitable financing options for the country given the magnitude of ongoing and future risks, legal and institutional opportunities and constraints, economic performance and possibilities for development of financial markets and products.

Activity 4.2.2 Conceptualizing risk financing/risk transfer instruments at national, regional and local levels through multi-level policy dialogue and advocacy process

The project will work closely with authorities, and financial institutions to facilitate policy dialogue on possibilities to reduce risks from floods and improve capacity for post-disaster recovery through different financing instruments. Based on the findings and recommendations of the gap analysis (Activity 4.2.1), as well as review of relevant international and regional examples (e.g., from Switzerland, EU, neighbouring countries), stakeholders are expected to be better able to reach consensus on the optimal financing model for the country and the most risk-sensitive regions (e.g., Polog).

The project will explore possible sources of funding for recovery and risk mitigation work (e.g., specific taxes and other public funds, credits/loans, donor support and insurances) their optimal combination (e.g., in national and/or regional-level financing instruments), and legal and institutional pre-conditions for such changes. As regards insurances, the project will explore best practices from around the world, including the introduction of mandatory insurance, options for government subsidizing the cost of insurance to the beneficiaries, etc.

More specifically, the support that the project can provide as part of this activity will include but not limit to: a) review of best practices/models for disaster risk management including financial instruments and corresponding institutional setup; b) support in drafting relevant legislation on the basis of selected model and requirement of the relevant EU and other international regulations (e.g., Sendai Framework for DRR); c) capacity development support to any reformed/newly created structure (e.g., through technical assistance, training, equipment, models, software...), and d) awareness raising on financing needs and options at different levels.

This process will produce important technical reports which will outline possible approaches and different options that will show the long-term economic gains of different financing scenarios.

On the basis on the new knowledge of risks, mitigation plans, people's perceptions and political will, the project will provide recommendations on creating enabling environment for private market development that would contribute to greater resilience against disasters.

SUBSTANTIVE REVISION

COMPLETED ACTIVITIES/ACHIEVED RESULTS UNDER THIS OUTCOME WITHIN THE SDC COMPONENT BY February 2022:

- Special emphasis is being placed on creation of intermunicipal cooperation mechanism, a Network for Resilient Polog, as a platform for shared resources/capacities in fulfilling with the risk mitigation/resilience building objectives for Polog.

- National Consultant with extensive knowledge and experience in local governance have been engaged to support the functioning of the Network for Resilient Polog, and to prepare necessary analyses and legal documents for establishment of a formal inter-municipal cooperation body for flood risk management in the Polog region.
- Number of meetings, workshops and presentations have been organized with the Polog Resilience Network, to discuss the DRR importance and the role of the national and local institutions involvement in the process. The preparedness and readiness to respond to a flood risk and how to improve the existing capacities is one of the topics of discussion. The Network was also informed about the need of upgrading the existing DRR municipal plans and their role in this process. The findings from different studies such as the preparedness and EWS model was presented on the last meeting in July 2021.
- Draft National Strategy for Flood Risk Mitigation developed. It focused on the following river sub-basins: Bregalnica, Crn Drim, Crna Reka, Lepenec, Pcinja, Strumica, Upper Vardar, Mid-Vardar, Low Vardar, and Treska, and provides recommendations for measures and actions that will reduce the flood risks, thus decreasing the damages and losses from floods in the future.

ACTIVITIES TO BE IMPLEMENTED BY THE END OF 2023 UNDER THE SDC COMPONENT

- Development of a comprehensive Transition Plan of the project form UNDP to respective national entities
- Formalization of an inter-municipal cooperation body for flood risk management in the Polog region.
- Increased role of the intermunicipal cooperation body in the project implementation will be pursued (e.g., through more active participation on priority project-backed investments, facilitation of permitting procedures, facilitation of resource mobilization at local level, ensuring that project-backed risk mitigation plans are adequately reflected into municipal plans, programmes and policy instruments).
- Strengthening capacities of the Network for Resilient Polog to serve as an advisory body and knowledge hub for an integrated flood risk management.
- Carrying out consultations for the draft National Strategy for Flood Risk Mitigation with an aim to create basis for flood risk mitigation at national level and mobilization of domestic and international financial resources;

Establishing a DRR Platform to improve the strategic planning, coordination and cooperation of the government entities on central and local level with responsibilities for flood risk management and disaster risk reduction, mobilize resources as well as to improve the donor coordination in this area.

Outcome 5 SECO & SDC

Key stakeholders at central and local levels have improved knowledge on DRR/flood risk management and prototyped innovative practices will serve as models for replication

Output 5.1 SECO & SDC

Project knowledge, lessons learnt, and best practices are systematized and shared nationally and internationally

A systematic approach to communication and awareness-raising will be applied to mobilize stakeholders and resources and to create partnerships for the development and implementation of projects. The project is expected to generate considerable information and knowledge from the practical implementation of contemporary approaches to flood risk management and DRR. This will be shared among a wide range of stakeholders at different levels, through the activities of this output.

Activity 5.1.1 Contribute to and take part in existing knowledge networks

The project will generate considerable information and knowledge on the target region and national-level flood risk priorities that will be shared through various national and international networks. The project findings and results will be promoted at different events on topics related flood risk management, DRR, river basin management and other compatible areas.

Since one of the keys to the longevity of the newly introduced infrastructural and other systems is the continuous capacity building of responsible personnel, the project will support networking and transfer of knowledge throughout all its components.

Considering the nature of the project interventions, the project will make support stakeholders connect with relevant Swiss partners (e.g., Swiss institutions, research and educational organization, professionals and experts working on DRR, flood risk management, regulation of torrential streams, early warning systems, and insurance), and take part in Swiss-funded initiatives dealing with such topics.

Activity 5.1.2 Fostering knowledge exchange between Macedonian and Swiss DRR specialists and universities

Considering the nature of the project interventions, the project will make efforts to establish connections with relevant Swiss partners with relevant experience (e.g., DRR, flood risk management, regulation of torrential streams, early warning systems, and insurance), and take part in Swiss-funded initiatives dealing with these topics.

The project will particularly work on establishing long-term connections between Macedonian and Swiss DRR/flood risk management specialists, educational and research organizations and students. As part of this activity, the project will support student exchange between Macedonian and Swiss universities on relevant topics and research related to the Polog region and/or flood risk management/DRR in the country.

Activity 5.1.3 Communication and advocacy for future replication and scaling-up are promoted

This activity will focus on systematically monitoring the achievements of the project, especially the application of novel approaches and technologies, documenting the successes and lessons learned and disseminating them among the key stakeholders at national and local levels. The activity will also support advocacy efforts in support of the future replication and scaling-up of innovative solutions, aiming to ultimately to stimulate a transformation into a better national-level flood risk management/DRR system.

Numerous publications, guidance materials and other knowledge products will be produced to improve visibility, knowledge and awareness on various relevant issues.

Education and other capacity building efforts are embodied throughout the project design, considering the importance of providing new knowledge and skills to responsible personnel from relevant institutions. As an elementary guidance to the training curriculum, the project will use the contemporary flood risk management approaches based on the source-pathway-receptor principle and the 'cascade of measures' (Figure 4). These topics include: (i) reduction of the flood source (reducing of runoff) to prevent high discharges and high flood risks downstream as the most favorable measure, (ii) reduction of the hydraulic load on flood control structures by reducing and transforming flood wave discharges and water elevations, (iii) conventional flood control measures, (iv) zoning measures to help reduce the potential impact, (v) impact reduction measures, such as flood proofing of houses, early warning and evacuation, and (vi) residual risk reduction measures, where other measures are not sufficient.

The success of the anticipated project activities will require significant improvement of knowledge and behavioral change among the stakeholders. To support this goal, various innovative approaches that have proven successful in other projects will also be applied under this project (e.g., foresight and gamification).

SUBSTANTIVE REVISION

COMPLETED ACTIVITIES/ACHIEVED RESULTS UNDER THIS OUTCOME WITHIN THE SDC COMPONENT BY FEBRUARY 2022:

Due to the Covid 19 outbreak and travel limitations posed, planned exchange activities between Macedonian and Swiss educational institutions, as well as study tours for the representatives of the relevant stakeholders could not be realized as planned.

The transfer of Swiss experience was done through the input provided by the Chief Technical Advisor, Marcus Zimmerman, particularly for the development of various technical documentation for riverbed reconstruction, landslides rehabilitation, etc. Also, a Swiss company Holinger was selected as a reviewer of technical design for riverbed restoration, and they provided valuable input for incorporating more environmentally friendly options in the design of the interventions.

Given that the development of the situation with Covid 19 in the country and globally is difficult to be predicted, the activities under this Outcome will be slightly changes. The focus will be put on promotion of gender mainstreaming and promotion of the project knowledge products.

ACTIVITIES TO BE IMPLEMENTED BY THE END OF 2023 UNDER THE SDC COMPONENT

- Mainstreaming gender consideration into the Flood Risk Management Plan, municipal Protection and Risk Plans and other relevant documents;
- Carrying out targeted capacity building training for relevant stakeholders in the Polog region such as the local-government administration, branches of the Crisis Management Centre and the Directorate for Protection and Rescue for gender planning and budgeting;
- Developing relevant knowledge products on flood risk management
- Publication featuring the results of the project, summary of the key studies, lessons learnt, and recommendation for future actions in the Polog region.

Resources Required to Achieve the Expected Results

Fundamental to the achievement of the project results will be input from the relevant project partners and stakeholders as well as technical consultants where foreseen. From the UNDP office, in addition to the Monitoring and Evaluation focal point at the office, and the Deputy Resident Representative leading the Project Board. The associated resources to support this are budgeted accordingly.

Partnerships

Close coordination will be established with other international organizations in the country active in the area of flood management, disaster risk reduction and similar (e.g., ongoing EU IPA projects, GIZ, JICA), as well as with relevant Swiss projects: Solid Waste Management project, Empowering Municipal Councils project, Balanced Regional Development project, Civica Mobilitas. The project will be implemented in close cooperation with the Ministry of Environment and Physical Planning, the Ministry of Agriculture, Forestry and Water Economy, the Water Management Organization, the Hydro-meteorological Service, the local self-governments of the region's municipalities, the Center for Development of the Polog Planning Region, and the affected communities in the target areas.

The DRR Platform which will be established by the project shall be utilized to improve the coordination and cooperation of the government entities on central and local level, as well as for better donor coordination in the area of flood risk/disaster risk management.

The projects which have been identified as having the greatest synergetic potential are:

- Disaster Risk Assessment and Mapping (IPA-DRAM) 2016–2019, implemented by the Swedish Civil Contingencies Agency (MSB, the Italian Civil Protection Department (DPC), the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR), the National Protection, Rescue Directorate of the Republic of Croatia (NPRD) and Centro Internazionale di Monitoraggio Ambientale (CIMA). The project supports the development of disaster risk reduction based adaptive capacity in the country of the region;

- Climate Change Adaptation in the area of cross-border flood risk management in the Western Balkans, implemented by GIZ. This project supports the development of national and local adaptive capacity to address flood risks and could provide entry points for improved national action and regional cooperation under the NAP process;
- Reducing Vulnerability of Agriculture to Climate Change implemented by FAO. The project supports the development of national and local adaptive capacity in the agriculture sector;
- Enhancement of Disaster Risk Reduction and Management capacities and mainstreaming Climate Change Adaptation practices into the Agricultural Sector in the Western Balkans implemented by FAO. The project aims to increase resilience of farming communities to natural hazards and strengthen institutional mechanisms;
- Project on Capacity Building for Eco-DRR through Sustainable Forest Management, implemented by the Crisis Management Center, the Ministry of Agriculture, Forestry and Water Economy and the Public Enterprise Macedonian Forests, financed by JICA. The project will carry out activities related to disaster model development of ecosystem-based disaster risk reduction (Eco-DRR). The project will develop upgrade the existing systems for forest fire control with functions to reduce risk from floods by improving forest management.
- Integrated climate-resilient transboundary flood risk management in the Drin River basin in the Western Balkans (MKD, Alb, MNG). 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 Drin River Basin to climate-induced floods

EU-funded IPA Floods and Fires program aimed at improving capacities for flood and forest fire risk management in Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, Serbia and Turkey. By fostering regional cooperation and exchange of good practices, the project shall work towards improving the legal and institutional framework related to the EU floods directive (EUFD), and institutional coordination among all the actors involved in the EUFD implementation, and improving prevention, preparedness and capacity to respond to forest fires at central, regional and EU level.
The success of the project will depend on the commitment and the interest of key project beneficiaries – to create partnerships to undertake concrete actions and measures that will lead to the achievement of the project goals. Moreover, all involved parties will need to commit to coherent and consistent communication of the project objectives, activities and results in order to ensure that the project is known and understood by the beneficiaries and the public at large.

Risks and Assumptions

The key assumptions that will underpin the project's success are presented in the following table:

Table 1: Overview of project risks and assumptions

Risk and Assumptions	Mitigation Strategy
Limited local level capacity for adopting new approaches to flood risk management, including the maintenance of the restored/newly introduced flood control infrastructure	Relevant capacity development assistance is embodied throughout the project design, especially on issues arising from the contemporary flood management concepts. The selection of priorities will also be based on a sustainability analysis, and the final funding decision will depend on the demonstrated ability of local stakeholders to accept, use and maintain introduced measures. Municipalities will also be assisted in meeting their legal obligations in areas relevant to the project (e.g., by supporting the preparation of municipal flood defense plans aligned with FRMP) Transition Plan shall be prepared, including capacity building for different entities to support local/national authorities in assuming their roles and responsibilities

	Funding decisions under the project will be linked to partner contributions to the extend and whenever possible. By this the projects that are considered the highest priorities for stakeholders will be given priority that will eventually lead to better sustainability prospects.
Ensuring sustainability of the monitoring system / early-warning system	UNDP has already partnered with the HMS in similar programmes in other places of the country (Strumica River Basin, Prespa). The project will build upon this longer-term capacity development support to HMS. The selection of monitoring sites and equipment will be done in close collaboration with HMS in order to take into consideration the sustainability barriers (e.g., operation and maintenance costs, difficulty to access sites). The DRR Platform will be used to open a dialogue about the sustainability of the hydrological and meteorological monitoring system managed by HMS, as well as to try to mobilize resources for more sustainable operations of this entity Local communities will also be involved in ensuring longevity of the monitoring stations as it is of their primary interest when it comes to protection against floods.
Delays in ensuring access to construction sites	Every effort will be made to avoid any legal issues related to land ownership as a result of the anticipated construction interventions (e.g., adjustment of project design in order to avoid private land) Part of the measures are expected to be implemented in remote mountainous areas where there are no major land-property related issues. Another part of the measures (especially infrastructure recovery) falls under the article 75 of the Law on Construction. Being damaged by a natural disaster (flood) their recovery to original state does not require standard construction permits. Close monitoring and regular collaboration with authorities to expedite permitting procedures Building upon the commitment expressed by authorities at all levels during project design stages
Delays in institutional reforms and adoption of the EU Floods Directive	The project will build upon the ongoing momentum and initiative of the newly appointed government (January 2022 and new Mayors and Municipal Councils in October 2022) Even in a situation of a lack of political climate for the necessary reforms and legislation harmonization, expert support could be provided to provide recommendations, and draft legal provisions. Consultations can be carried out at technical level so that the relevant professionals are acquainted with the necessary processes that is considered critically important in pursuing the change once the conditions are restored. Moreover, the DRR Platform will be used to keep the flood risk management high on the Government agenda The project will use the ongoing momentum for improvement of the flood management system that was created by the significant adverse consequences of the latest floods. Much of the proposed project activities are already discussed with the highest level of Government that will be used to facilitate project implementation.

Stakeholder Engagement

The project is designed to enable broad stakeholder participation not only to facilitate project implementation, but also to improve overall regional and nationwide flood risk management. A wide range

of stakeholders with overlapping, and often conflicting interests have been identified and will be involved from the project outset in identifying gaps and formulating and implementing possible solutions.

The key project partners and beneficiaries are the Ministry of Environment and Physical Planning, the Ministry of Agriculture, Forestry and Water Economy, the Water Management Organization (legal entity in charge of the maintenance of irrigation and flood control structures outside of the urban scope), the Hydro-meteorological Service, the local self-governments of Polog municipalities, the Center for Development of the Polog Planning Region and the affected communities.

The project will be launched in a context of limited capacities of the key responsible institutions for the integrated management of floods, and ongoing reforms of the water sector. Through carefully planned and implemented comprehensive capacity development support, project partners will benefit from new knowledge and expertise in the relevant fields of flood risk management and DRR. This will enable them, at the end of the project, to continue implementing more independently future FRMPs.

For the specific activities related to preparedness, relief, recovery, and early warning, the project will also partner with the specialized agencies in charge of disaster risk management. The Crisis Management Center (CMC) and the Directorate for Protection and Rescue (DPR), especially their branch offices in the region, will benefit from project support in terms of improved capacity to address flood risk management issues (throughout the key stages of the DRR cycle).

The Flood Risk Management Plan will be developed through a highly participatory process designed to encourage discussion about challenges, ways to overcome conflicting interests, contributing to a common vision for the region, and prioritizing interventions. The process will be used to facilitate transfer of lessons learned from other Basins in the country (e.g., Prespa, Strumica and Bregalnica) and the wider region, and to provide training on integrated flood risk management in a multi-stakeholder environment.

The project will specifically focus on enabling the inclusion of the interests of different social groups, especially the most vulnerable ones, in the project planning and priority identification processes. For this purpose, it will include disaggregated demographic and social data (e.g., proportion of women, men and children; ethnic structure, including Roma; people with disabilities and other vulnerable groups in the high-risk areas), providing site-specific interventions that will address the key threats to sustainable development from floods, vulnerabilities and inequalities among affected social groups. In addition, representatives of different social groups will be involved in the participatory mechanisms that will be introduced for the needs of project planning and implementation (besides water standard resource/flood risk/emergency response stakeholders, these cross-sectoral participation instruments will include representatives of CSOs/NGOs dealing with different social issues [e.g., gender, ethnic cohesion, poverty alleviation, Roma, people with disabilities]). In this way, the project will encourage a more balanced representation of women, men and different social interests throughout the entire project lifespan, creating a model to be followed upon project closure.

An extensive but not exhaustive list of stakeholders to be involved in and benefit from the project is included in the following table:

Table 2. Key stakeholders and their role in the project and management

	Stakeholder	Role	Capacity and buy-in
1.	Ministry of Environment and Physical Planning (MoEPP)	• Key authority for flood risk and river basin management in the country • Will gain additional mandate in flood risk management (because of harmonization of the national legislation with the EU Floods Directive) • Holds the Executive function on the Project Board	• Requested support for implementing specific flood risk mitigation and recovery interventions in Polog Region • Expressed interest to co-finance part of the activities (e.g., flood control measures in Pena River, Shipkovica torrent) • Wishes to strengthen its role and capacity in the overall flood management system, through the adoption of the EU Floods Directive

			• Implements other ongoing donor funded projects (mainly EU) pursuing similar objectives, thus will have critical higher-level coordination role
2.	Basin municipalities (Tetovo, Gostivar, Bogovinje, Tearce, Jegunovce, Zelino, Mavrovo-Rostuse, Brvenica and Vrapciste)	• Main project beneficiaries • The process of decentralization gives them an increased role in environmental / water / flood management • Responsible for implementation and maintenance of flood control measures within their administrative boundaries	• The most affected by consequences of flooding and other disastrous events, hence with great interest to take part in such projects • The decentralization process resulted in significant new responsibilities but without the systemic capacity and financial resources to comply; they are therefore interested to receive capacity development assistance in flood risk/water resources management, including know-how on flood risk mitigation, recovery and maintenance of infrastructure • Expressed support to initiate a process of transforming current urban/development planning into a more risk-sensitive approach
3.	Water Management Organization	• Newly created institution in charge of operation and maintenance of irrigation and drainage (flood control systems), including river regulation outside urban area • Will be part of the capacity development assistance since the operation & maintenance of part of the project-support infrastructure will be its responsibility	• As institution it needs assistance in adopting contemporary approaches to recovery and maintenance of flood control infrastructure (e.g., budgeting, regular maintenance program, field capacity)
4.	Ministry of Agriculture, Forestry and Water Economy	• State authority in charge of irrigation and drainage systems • Will be part of the capacity development assistance, especially on those aspects that arise from new EU-based legislation	• Despite the transfer of water management responsibilities to the Ministry of Environment and Physical Planning, this ministry still maintains an important role in managing irrigation and drainage/flood control systems (dams, regulations) • It possesses valuable historical experience in developing and maintaining water resources / flood control systems that need to be systematized and shared in support to their improved functioning • It needs support to adopt new approaches to flood risk management and continue contributing with knowledge and experience in the transformation of the country-wide water resources/flood risk management system

5.	Hydrometeorological Service (HMS)	• State institution for meteorological and hydrological monitoring • Critical role in the functioning of the future early warning system • Possesses historical data from monitoring/research programmes/studies that are important in the formulation of the FRMP	• They are among the institutions that were held accountable for poor forecasting of the extreme weather events and failure to provide timely warning in recent flood disasters; therefore, they are interested to receive capacity building assistance for improving monitoring and early warning • They have certain internal capacity in terms of expertise which needs to be further developed to start using sophisticated simulation models, better forecasting and more agile early warning • They have limited financial resources to maintain the hydrological and meteorological network, and need support to either get it from the Government or to mobilize it from donors, in order to be able/willing to assume additional duties
6.	Emergency response agencies (Crisis Management Center and Directorate for Protection and Rescue)	• Specific roles in DRR and flood risk management • Will be part of the capacity development assistance • Will be involved in the co-design of training program and drills on disaster readiness	• There are number of donor funded projects currently supporting the CMC and DPR to overcome systemic deficiency in emergency planning and response • Based on current legislation they play important role in the overall disaster risk management system and therefore will be part of the capacity development assistance and in tailoring a specific institutional setup model for integrated flood risk management in the Polog Region
7.	Center for Development of the Polog Planning Region	• Important stakeholder representing/articulating the interests of region's municipalities • • Will be part of project-backed educational/awareness raising activities; and will receive support to further share modern approaches of flood management at local level	• Its experience and capacity is mainly in developing and coordinating regional, inter-municipal initiatives • It will be supported to increase capacity in water resources / flood risk management in a regional context, facilitating cooperation among the nine municipalities of the region • It can support planning and prioritization efforts through data collection, balancing interests among different municipalities, stakeholder participation and direct implementation of local project activities
8	Network for Resilient Polog	• Informal network of representatives of local governments and emergency agencies	• They have interest to participate in various capacity building activities and increase their knowledge on DRR and flood risk management •

		• They provide expert opinion on respective project activates/reports based on their expertise and knowledge of the local conditions • Serves as a main stakeholder body that should support the establishment of an inter-municipal administrative body for flood risk/disaster risk management	
9.	NGOs/CSOs	• Beneficiaries of the project results • Partners and supporters to the project implementation (e.g., Red Cross, environmental and social CSOs/NGOs) • Will be part of the trainings and drills (e.g., through volunteer brigades) • Can support community outreach efforts, conducting surveys, collecting social and environmental data at local level	• They have interest but lack experience and expertise in dealing with flood risk management issues • They will be supported to better understand the role of civil society in a robust governance system • Local CSOs/NGOs will take part in planning and prioritization efforts through participation in different stakeholder involvement mechanisms, representing the interests of different social groups, including the most vulnerable ones
10.	Insurance Supervision Agency	• Key regulatory body in flood insurance in the country • Have access to earlier studies/analyses and historical data on insurance that can be used by the project	• Partner in activities related to conceptualizing and advocating for long-term financing mechanisms (focused on insurance) for flood recovery and flood risk management • Can receive capacity development support in terms of new models for insurance (e.g., by studying Swiss experiences)
11.	EuropaRe (and other (re)insurance companies)	• Important stakeholder in flood insurance providing technical assistance for catastrophe risk insurance facility in Southeast and Central Europe (co-financed by SECO)	• The project has shared interest with EuropaRe to address the reasons for the very low levels of catastrophe and weather risk insurance penetration in Southeastern Europe
12.	Public Forest Enterprise (Macedonian Forests)	• Key entity managing forest resources in the country as per government approved management plans	• Will be involved in the project from its outset, including in the exchange platform, and capacity building programmes • Forest cover management influences hydrological regimes and gravitational natural hazards (e.g., mudflow). The project will provide guidance to the respective authorities on proper, risk-based forest management in line with the Eco-DRR and other complementary approaches

The project is designed so as not to exclude any stakeholder based on gender, age, ethnicity, or religion. It will particularly attempt to mainstream gender aspects in different interventions by recognizing the differential impact of floods on different genders. This will include collection and analysis of gender-

disaggregated data and, wherever applicable, implementation of specific measures for different gender groups. The project will consider the latest relevant strategies, policies and incentives to address the gender issues and enable both men and women to benefit equally and equitably from the project.

The necessary data will be provided through multiple sources at national and local levels and will be complemented by baseline analyses (including targeted field surveys to better understand the structure and vulnerabilities of specific social groups). Data on special vulnerability can be provided by the relevant sectors of municipalities, local centers for social welfare, the Ministry of Labour and Social Policy, etc. Local CSOs/NGOs representing the interests of different social groups (e.g., women, Roma, people with disabilities) and dealing with social issues will be included in the planning efforts and in conducting surveys among local communities.

Based on these improved analyses, the FRMP will propose specific measures to address the challenges faced by different social groups (e.g., gender-sensitive actions). Similar recommendations will be integrated into the national-level strategic guidelines for flood risk mitigation.

The project will invest efforts to ensure balanced representation of women and men in different project activities (e.g., consultations, trainings, planning processes, identification of implementation priorities, decision-making at local and national levels). Moreover, the project will try to identify gender champions and support women leadership in institutionalizing gender-equal planning, implementation and monitoring activities.

As part of the trainings, the project will include modules on special vulnerability of the most endangered population in high-risk areas. In addition, recognizing the role of educating young people in future management of floods, the project will pay special attention to involving schools and youth clubs (established earlier by different projects), as places for communication and awareness raising of young people.

The project will try to reveal to what extent women and different social groups are differently affected by floods and to seek opportunities to enhance their influence in decision-making about future flood measures (e.g., through improved knowledge, skills, resources and partnerships).

Compliance and response mechanisms
UNDP shall also ensure that potentially affected people have access to and are aware of mechanisms to submit concerns about the social and environmental impacts of a project. The key instruments which will be used are UNDP's Social and Environmental Compliance Review and Stakeholder Response Mechanism

(http://www.undp.org/content/undp/en/home/operations/accountability/secu-srm.html).

UNDP's Social and Environmental Standards (SES) underpin its commitment to mainstream social and environmental sustainability in its Programmes and Projects to support sustainable development. The objectives of the Social and Environmental Standards Procedure are to: (a) integrate the SES Overarching Principles (human rights, gender equality and environmental sustainability); (b) identify potential social and environmental risks and their significance; (c) determine the project's risk category (Low, Moderate, High); and (d) determine the level of social and environmental assessment and management required to address potential risks and impacts. The Social and Environmental Compliance Review is mandatory for all UNDP projects worth more than USD 500,000, and therefore the project must undergo this process.

The Stakeholder Response Mechanism (SRM), on the other hand, provides a supplemental, formal avenue for stakeholders to engage with UNDP. The SRM will be available to project-affected stakeholders, government agencies and other partners to jointly resolve concerns and disputes when they believe that the project may have adverse social or environmental impacts; they have raised their concerns with UNDP through standard channels for stakeholder consultation and engagement; and they have not been satisfied with the response. This mechanism can help the concerned parties to start or restart dialogue, facilitate discussions, mediate disputes, enhance understanding of the facts, and undertake other activities that might help resolve concerns and disputes.

Knowledge

Numerous publications, guidance materials and other knowledge products will be produced to improve visibility, knowledge and awareness on various relevant issues.

The project will generate considerable information and knowledge on the target region and national-level flood risk priorities that will be promoted at different events on topics related flood risk management, DRR, river basin management and other compatible areas. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

Since one of the keys to the longevity of the newly introduced infrastructural and other systems is the continuous capacity building of responsible personnel, the project will support networking and transfer of knowledge, especially with partners from Switzerland and the EU.

A systematic approach to communication and awareness-raising will be applied to mobilize stakeholders and resources and to create partnerships for the development and implementation of projects. The project is expected to generate considerable information and knowledge from the practical implementation of contemporary approaches to flood risk management and DRR. This will be shared among a wide range of stakeholders at different levels.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Depending on specific requirements of both donors and/or authorities, UNDP will prepare and share combined (program) or individual (project) reports. In such way, it will be possible to distinguish between the individual contributions of the two separate funding sources, as well as to present the combined effect of the entire Swiss-funded program. Wherever possible, UNDP will combine monitoring and evaluation activities on both components to optimize use of resources and strengthen synergies.

Sustainability and Scaling Up

The sustainability dimension is integrated into the project design and will be given due consideration throughout the entire project lifespan. By providing important capital investments to support localized solutions to flood-related challenges, including building long-term local capacities, the project will incentivize stakeholders to become the main drivers of change. This will ensure not only a successful project implementation, but most importantly sustainability of the specific project results and their transformation into positive impacts for the entire region.

The selection of priority implementation measures will also consider the sustainability aspects, including possible multiple-benefits, operation and maintenance capacities, financial capabilities and overall acceptance of interventions by the key stakeholders. Similar criteria will be applied in designing and operationalizing the early warning system.

The experience and lessons this project will generate from the implementation of an EU-based flood risk management approach will be of critical importance for finalizing the harmonization of the national legal system with the EU water regulations. The adoption of the EU Floods Directive is among the few incomplete processes that need to be finished to achieve full alignment with EU regulations. It is therefore one of the Government's key priorities. Growing concern over the adverse effects of extreme hydrological events considering the most recent tragic consequences of flooding are expected to mobilize additional support for applying contemporary approaches to flood risk management, building a strong basis for the sustainability of the newly introduced management approaches.

Implementing the project will be one of the key drivers toward the region's sustainability. The project will help significantly mitigate flood risks, preventing adverse economic, environmental and social effects that could hamper the region's development agenda.

Transitional Plan shall be prepared to ensure smooth transition from the current UNDP-backed implementation approach to a more self-governing system toward the end of the project at the end of 2023. The project transition plan shall list the tasks and activities that are required to transition the project from UNDP to one or more national entities, and the timeline. It will also integrate capacity development for the respective entities, and risk mitigation activities to ensure smooth transition. The Transition Plan shall also

refer to the responsibilities of respective national entities which have to ensure the implementation of the Flood Risk Management Plan for the Upper Vardar River Basin.

The analysis of the sustainability aspects the project outputs is provided in the table below:

Table 3. Sustainability considerations

Project Outcome	Project Output	Sustainability measures
OUTCOME 1: Authorities and communities have an improved understanding of flood risks in the Polog Region and the capacity to manage them in an informed manner (SECO)	Output 1.1 A Flood Risk Management Plan for the Polog region is established in accordance with the EU Floods Directive and DRR principles (SECO)	There is a profound interest among local stakeholders for introducing and maintaining systemic solutions to the growing flooding risk in the Polog Region. The reduced risk of floods will help decrease economic losses in the future. The FRMP will yield series of mitigation measures identified throughout a comprehensive planning process and based on sustainability criteria, for example: a) emphasis on high-risk areas and vulnerable communities groups/communities; b) capacity to maintain infrastructure, access to finances; c) co-funding possibilities; d) environmental considerations; and e) willingness of municipalities to improve flood management in line with project recommendations; and f) possibility for demonstration of novel approaches and techniques with replication potential. Once the legislation is completed the preparation of FRMP will become a mandatory requirement for each river basin. Polog Region/Upper Vardar River Basin will be supported to have such documentation that will also serve as a model for replication
	Output 1.2 Authorities are equipped with new knowledge to mainstream flood risk mitigation and DRR priorities in future municipal urban and other development plans (SECO)	While it is uncertain if the project will be able to influence the adoption of the risk-sensitive urban plans, the case studies developed throughout the project will provide solid basis for doing so once the conditions have matured. All new methodologies and lessons learnt will be documented and made available to the relevant stakeholders.
OUTCOME 2: Disaster preparedness of institutions and communities in the Polog region for effective response, recovery, rehabilitation and reconstruction is enhanced (SDC)	Output 2.1 Functional long-term floods early warning system for the Polog region is established (SDC)	The overall responsibility for the operation and maintenance of the monitoring stations (key element of the early warning system) rests within the Hydro-meteorological Service – a state institution with permanent although not sufficient funding possessing also the necessary expertise. The entire system will be co-designed with HMS and other relevant institutions in order to adjust it in line with the financial limitations and O&M capacity. Still advocacy for increase of their capacities (human, financial) and financing is needed Possibilities for local level contributions to the financing of the system and its operation will also be explored. The sustainability of the early warning system will also be supported by its cost-effectiveness and use of existing capacities in creating localized, modest, but long-lasting monitoring support.

	Output 2.2. Flood disaster response capacity is improved through public awareness campaigns on early warning system and inclusive drills (SDC)	The campaign will be designed to ensure that project beneficiaries and other stakeholders are capacitated to continue transferring the new knowledge through different networks beyond project closure. The recent damage caused by floods and the associated costs have raised interest in identifying better approaches to dealing with flood risk. The campaign will take into account the ongoing momentum and will consider the key context-specific entry points in order to generate positive change.
OUTCOME 3: Priority flood risk mitigation measures informed by international best practices are implemented to effectively reduce future risks in the Polog region (SECO & SDC)	Output 3.1 Urban resilience is improved through implementation of priority state-of-the-art flood risk mitigation measures (SECO)	Sustainability criteria will be applied in conceptualizing the main flood mitigation options to be supported, such as: a) improving the operating regimes of existing systems (not building new ones that will create additional operation and maintenance costs); b) implementing ecosystem-based, 'no-regret' measures with multiple benefits (besides flood protection) which are also less expensive to maintain (e.g., watershed management, restoring riparian zones/floodplains); c) selecting measures that balance economic, environmental, public and private interests through an all-inclusive stakeholder engagement processes; and d) prioritize measures with the highest partner contribution potential Applying 'build back better' principles and enhanced resilience objectives in recovery efforts, backed by identification of financing possibilities will ensure the longevity of the infrastructure. Upon finalization of the infrastructure recovery/development measures, the respective infrastructure will be commissioned and handed over to the relevant national/local authorities for future use and maintenance (e.g., municipalities or water management organization depending on their legal mandate). For this purpose, even in the project identification stages the respective institutions should demonstrate readiness, capacity and access to financial resources to maintain the infrastructure.
	Output 3.2 Rural communities have increased resilience to floods through practical application of targeted low-cost nature-based measures (SDC)	Sustainability criteria will be applied in conceptualizing these nature-based mitigation options, such as: a) implementing ecosystem-based, 'no-regret' measures with multiple benefits (besides flood protection) which are also less expensive to maintain (e.g., watershed management, restoring riparian zones/floodplains); b) selecting measures that balance economic, environmental, public and private interests through an all-inclusive stakeholder engagement process. Upon finalization of the infrastructure recovery/development measures, the respective infrastructure will be commissioned and handed over to the relevant national/local authorities for future use and maintenance. For this purpose, even in the project identification stages the respective institutions should demonstrate readiness, capacity and access to financial resources to maintain the infrastructure.

OUTCOME 4: National legal and regulatory framework for disaster risk reduction is improved in line with the Sendai Framework and the EU Floods Directive and risk financing and risk transfer mechanisms are conceptualized (SECO & SDC)	Output 4.1 National legal and regulatory framework for flood risk management is harmonized with the EU Floods Directive (SDC)	The reforms in the country-level flood management system are considered a top priority especially considering the most recent adverse consequence of flood events. The adoption of the EU Flood Directive is placed high on the agenda as this directive is the only piece of water-related legislation that has not been introduced to the national legal system. The DRR Platform shall contribute to keep the flood risk management high on the Government agenda The new institutional setup model design for integrated flood risk management, the intermunicipal administrative body, will consider the key sustainability elements (e.g., running costs, financial resources, current and future human capacities...).
	Output 4.2 Risk financing and risk transfer mechanisms are conceptualized and advocated to become part of the national-level flood risk mitigation strategy (SECO)	While it is uncertain that appropriate financing mechanisms for flood risk management and recovery will be in place by the end of the project, the analyses provided will surely present a strong foundation for 'institutionalizing' such instruments. These analyses will be the first ever for the country and as such will be valuable for opening the processes for gradual adoption of better financing mechanisms (including changes in taxation system, insurance schemes). The project will use its strong position in the country to facilitate the introduction of these new instruments as early as possible (preferably in the course of project implementation).
OUTCOME 5: Key stakeholders at central and local levels have improved knowledge on DRR/flood risk management and prototyped innovative practices will serve as models for replication (SECO & SDC)	Output 5.1 Project knowledge, lessons learnt, and best practices are systematized and shared nationally and internationally (SECO & SDC)	Project progress, achievements and lessons learnt will be documented and shared at different levels. Emphasis will be placed on the effects of the newly applied technologies and solutions that will be made available to professionals and decisions-makers in formats that are considered the most suitable for them. This new knowledge will also be transferred through training programmes targeting different stakeholders. By this the knowledge generated throughout the project implementation will be stored and made widely available.

The proposed project has excellent scaling-up and replication potential which is embodied throughout the project design. The project will generate an effective model for integrated flood risk management in the country. By capitalizing on previous experiences, it will attempt to further raise the benchmarks established with other national projects pursuing similar objectives (e.g., Strumica River Basin). The practices to be demonstrated are relevant to the existing and emerging disaster risk-related challenges faced at national level, but also in a much broader context.

Scaling-up in the area of flood risk management will be achieved through supporting the efforts for harmonizing the national regulations with the objectives of the EU Floods Directive. Designed in such a way, the project will provide the direct support and know-how required to overcome the existing barriers to n adopting the contemporary, Floods Directive-based methodologies in flood risk management at national level and basin-scale.

The lessons learned and best practices will be shared in a way that contributes to the latest international developments in the field of integrated flood risk management, and disaster risk reduction. For this purpose, cooperation will be established with regions confronted with similar challenges, including from Switzerland.

Numerous publications, guidance materials and other knowledge products will be produced to improve visibility, knowledge and awareness on the project issues.

In the final project stages, a thorough assessment of the achievements against the project indicators and objectives of the FRMP will be carried out. This progress assessment will serve as the basis for the formulation of the subsequent FRMP. This approach, supported by capacities established at regional and national levels, will ensure the continuity of the efforts towards the greater resilience of communities. Such an exit strategy is considered the most appropriate one given the nature, size and degree of complexity of the project and the challenges it intends to address.

The project is designed to ensure maximum use of existing country systems, such as the institutions charged with flood management responsibilities (e.g., MoEPP, MAFWE, HMS, and Water Management Organization), municipal administrations and emergency response agencies (Crisis Management Centre and Directorate for Protection and Rescue.

IV. PROJECT MANAGEMENT

Cost Efficiency and Effectiveness

UNDP has been active in the country since 1998. Its work focuses on three main areas: 1) helping to increase the effectiveness of governance at national and local level; 2) promoting social inclusion; and 3) ensuring environmental protection and disaster risk management. It is extensively involved in the context of environment and especially integrated river basin management, flood risk management and DRR. UNDP has completed river basin management plans and flood risk management plans for the most significant river basins in the country. The EUR 10 million flood recovery program funded by the European Union has been successfully completed, addressing infrastructure damages from river flooding in the south and east in early 2015. With funding from the Swiss Agency for Development and Cooperation (SDC), UNDP for several years was supporting the introduction of the EU Floods Directive's principles in the Strumica River Basin and also undertaking numerous local level flood risk mitigation efforts. These efforts have made UNDP is the "go to" international organization in the country on flood risk assessment and management.

Using the lessons learned from the previous efforts, UNDP bases the strategy for this project on the concept of risk reduction by identifying and addressing underlying causes and drivers (e.g., improper urbanization, poor resource management practices, socio-economic conditions and inequalities, environmental degradation as well as climate change effects).

Following a process of robust participatory planning, the project will support the implementation of an optimized combination of basin-scale measures including institutional development for better flood risk management, the creation of basin-wide flash flood early warning and public alert systems, and infrastructure recovery and/or development projects that demonstrate cutting-edge approaches and contemporary international experiences (e.g., from Switzerland and the EU). The project-backed flood risk management planning process will not only provide short-term measures to be implemented in its later stages but will also build a long-term flood risk reduction strategy for the region aiming to guide future investments by government agencies, municipalities and donors.

Combining these effects will ultimately measurably improve the overall community resilience to floods in the Polog Region and will assist the alignment of the country-level flood management system with EU-based and other contemporary concepts and approaches.

Project Management

The entire program will be implemented as two parallel projects (SECO and SDC funded) contributing to the same overall goal of building resilience of Polog Region communities to future floods. For this purpose, UNDP will sign two cost-sharing agreements (CSA) – one with SECO and one with SDC. SECO's contribution will start with a preparatory planning stage that will help identify investment priorities and co-funding opportunities. After the planning stage, SECO will support the subsequent, implementation stage that will run in parallel to the SDC-funded component.

Both projects will be implemented under the 'support to NIM' modality with the Ministry of Environment and Physical Planning (MoEPP) as the implementing entity/responsible partner. The Ministry will be responsible for ensuring the government's participation in the project and the timely and verifiable attainment of project objectives. The MoEPP will also facilitate interaction, coordination and input of the relevant ministries, public organizations, research institutions and private organizations.

The project will be implemented through close collaboration and coordination with the Ministry of Environment and Physical Planning, the local self-governments of the region's municipalities, and their communities, the Hydro-Meteorological Service, the emergency response agencies, the Water Management Organization, relevant Civil Society and Community-based Organizations, and the affected population in the target areas.

The UNDP Country Office will be responsible for developing and managing the projects and ensuring that the results are delivered as planned and that the resources are used efficiently and effectively. It will be responsible for the procurement and recruitment of the project staff, consultants and consulting companies, and other contractors. UNDP will be also responsible for overseeing project budgets and expenditures; project evaluation and reporting; result-based project monitoring; and organizing independent audits to ensure the proper use of funds. Procurement, recruitment, financial transactions, auditing and reporting will be carried out in compliance with UNDP procedures for national execution, based on the Agreement for Provision of Support Services signed between UNDP and the Ministry of Environment and Physical Planning.

The UNDP Country Office will also be responsible for timely submission of progress reports, audit and evaluation reports to the Donors (SECO and SDC) and to the authorities through the Ministry of Environment and Physical Planning.

UNDP's internal project management resources from the Environment and Disaster Risk Reduction Practice Area will be engaged for the needs of project implementation. The Project Management Unit will be shared equally between the two components of the programme (SECO and SDC).

UNDP has a zero-tolerance policy for fraud and corruption that covers not only its staff but also non-staff personnel, vendors, implementing partners and other responsible parties. The organization's procurement processes are regulated in detailed guidelines that require that the following general principles are applied to all phases and types of procurement: best-value-for-money; fairness, integrity and transparency; effective competition; and UNDP's interest. UNDP procurement processes provide all eligible offerors with timely and adequate notification of UNDP requirements and an equal opportunity to tender bids for goods, works and services. The organization's internal Office of Audit and Investigation is responsible for the internal audit of UNDP activities and for assessing and investigating allegations of fraud, corruption and other wrongdoing. Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve UNDP operations. The organization also has a strong internal control system regulated by the UNDP Internal Control Framework.

Audit is incorporated in the standard rules and procedures of UNDP and is performed systematically in accordance with specific criteria. As a basic principle, all projects that have annual budget of USD 2.5 million or more, or that have a total budget of USD 10 million or more are subject to audits. Projects can be selected by UNDP HQ for external audit in accordance with UNDP rules and regulations. If audited, either an audit company is selected by UNDP or the audit is conducted by the UNDP Office of Audit and Investigation (OAI).

UNDP Country Offices are also subject to regular internal audits performed by OAI. The Country Office in Skopje was last audited at the end of 2014 and in 2019 and received an overall rating of 'satisfactory' in final public reports. This is the highest-possible rating and in the OAI definitions means that: "Internal controls, governance and risk management processes were adequately established and functioning well. No issues were identified that would significantly affect the achievement of the objectives of the audited entity."

UNDP DIRECT PROJECT COSTED STAFF AND ROLES

In addition to the project staff, depending on the nature of the work and complexity a number of technical and administrative roles and services are covered by the UNDP country office and are cost-shared within the office. Based on the needs of the action and the projected inputs, the following positions are included, on a pro-rata basis, as direct costs to the action. The time allocation is based on the existing workflow in the UNDP

office and is pro-rated to the scale of the budget and the scope of the action requiring different time inputs from different positions. Timesheets shall be provided for each of the staff.

The Programme Officer in charge of the Energy, Environment and Disaster Risk Reduction Portfolio will provide strategic guidance, policy advice and technical input essential to deliver development results. She will also create synergies with other complementary interventions which contribute to the achievement of the overall project goal. She will oversee the project implementation, monitor and report to the donor, provide project quality assurance, review and approve the TOR (programmatic aspects), serves as a Chair of the Evaluation Committee, and will facilitate decision making to ensure project implementation proceeds in a flexible but efficient manner. She will be the key focal point for coordination between the Project, UNDP, SDC and the national partner authorities and other key Project stakeholders.

Programme Associate & Monitoring and Evaluation Office will ensure that the project complies with the mandatory requirement for monitoring and evaluation are followed and will also support the project team in procurement and recruitment processes and budget management.

The UNDP Operations team will provide administrative support in terms of procurement, operations management, human resources, financial management, and other required administrative support.

The Operations Manager will be directly involved in procurement and HR processes related to project implementation in line with the SOP including but not limited to: providing inputs to TOR, specifications, endorsing procurement processes, recruitments and HR management for project needs, disbursement officer for payments. In addition, he will provide quality assurance, advises on procurement and HR processes for the need of the project. He will manage external relations related to all operational aspects of the project.

The Procurement Associate will assist project implementation through facilitating quality, transparent, effective and fast procurement processes; reviewing and announcing procurement processes; provide direct advisory support in procurement/tender evaluation processes; support in negotiations with potential contractors (as needed); assistance in the process of contracting, monitoring of contracts.

The Programme Finance Associate will provide support in preparation of the budget, budget revisions, support to overall financial monitoring and reporting for the overall action. He will assist the project team in preparation of financial transactions and appropriate financial reports.

UNDP will make sure that the project staff possess the necessary combination of skills and interdisciplinary expertise in response to the complexity of the project actions. The key staff involved in the project implementation will be compensated for their services in line with UNDP's rules and procedures and their contribution to the implementation of project activities as elaborated in the budget breakdown.

UNDP's direct costs will be charged in line with its rules and regulations, as outlined in the project document and the respective budget. Financial transactions and financial statements will be subject to the internal and external auditing procedures laid down in the Regulations and Rules of UNDP.

Remuneration / indirect costs corresponding to 8% GMS which UNDP is mandated to recover in line with UNDP's Executive Board's and relate to the corporate level costs and embrace e.g. corporate executive management, corporate legal support, corporate legal management, policy guidelines on procurement and logistic support etc.

The majority of the project team (Project Manager, Project Assistant, Monitoring Officer and Communication Officer) will be located in the UNDP premises in Skopje. The Coordination/Outreach Officer shall be located in the project office in Tetovo.

The project office costs will include expenses for rent, electricity, heating, water, utilities, internet, security, cleaning and maintenance, telecommunication services, based on UNDP monthly average expenses for such services. The costs will be pro-rated.

The project office costs shall also include: office furniture, IT Equipment for the project staff, costs for office supplies communication costs (mobile telephones, telephone services and e-mail subscription services for the project staff; purchasing and maintenance of a project vehicles that will be used for the implementation of the project (fuel, insurance, regular servicing, technical inspection); per diems for missions local/travel.

The project office costs also include purchase of a project vehicles that will be used for the implementation of the project. Upon finalization of the project, the ownership of the vehicles shall be transferred to a project beneficiary in accordance with applicable UNDP rules.

All purchased equipment will be transferred to the project beneficiaries. Matters relating to the transfer of ownership by UNDP to the national partners will be processed in accordance with the relevant policies and procedures of UNDP.

The project might be selected for external audit in accordance with UNDP rules and regulations. The cost of the audit is 0.4% of the project budget but not less than USD 10,000. These costs are not included in the project budget, so if the project is selected for an external audit, UNDP will cover them from its own resources.

V. RESULTS FRAMEWORK

Hierarchy of Objectives Strategy of Intervention	Key Indicators	Data Sources Means of Verification	External Factors (Assumptions & Risks)
Impact (Overall Goal)	**Impact Indicators**	**Means of Verification**	**External Factors (Assumptions & Risks)**
The resilience of Polog Region communities to flood disasters is improved, contributing to sustainable and inclusive growth **(SECO & SDC)**	Benefit-to-cost ratio higher than 7 for damages and losses after the project intervention Size of population (in high-risk areas benefiting from improved flood risk management Changes in community willingness to accept certain risk and willingness to pay to reduce risk	Modelled simulation scenarios for damages and losses Project reports Disaggregated data on population benefiting from the project (gender, vulnerability status) Willingness-to-accept and willingness-to-pay surveys at the beginning and the end of the project	National and local institutions determined to implement and ensure sustainability of flood risk measures.
Outcomes	**Outcome Indicators**		**External Factors (Assumptions & Risks[5])**
Outcome 1: Authorities and communities have an improved understanding of flood risks in the Polog region and the capacity to manage them in an informed manner **(SECO)**	1. Flood risk mitigation actions / investments taken by responsible institutions are informed and coordinated by the Flood Risk Management Plan for the Upper Vardar River Basin / Polog Region ***Baseline:*** No integrated planning base for flood risk management in the Polog Region/Upper Vardar River Basin (2017)	Project reports Reports by institutions at national and local levels (showing compliance of flood risk mitigation investment decisions with the FRMP, public expenditures monitoring reports)	Key institutions gain better understanding of flood risks (genesis, causes and adequate management responses), and economic logic behind prevention/mitigation investments, and accept to apply the recommendations of the FRMP in a coordinated manner Competing short-term funding priorities at local level, and possible additional financial constraints (nationally and/or locally) slow

[5] The baseline assessments contributed to the identification of the main risks and the creation of a focused risk-management strategy

	Targets: Nine municipalities and at least four national level institutions have access to up-to-date flood risk assessments and better understanding of necessary priority mitigation actions (2018 – 2023) 2. Percentage of increase in public expenditures for DRR/flood risk mitigation actions across the Upper Vardar River Basin / Polog Region Baseline: There is no consistent long-term public financing of flood risk mitigation actions Target: At least 20% increase of public expenditure on DRR/flood risk mitigation by 2021, and 30% by 2023		down the decisions to invest in DRR/flood risk mitigation
Outcome 2: Disaster preparedness of institutions and communities in the Polog region for effective response, recovery, rehabilitation and reconstruction is enhanced **(SDC)**	1. Number of people in flood risk zones benefiting from a functional flash flood early warning and public alert system in the Polog region Baseline 75,000 (49.8% women, 35.4% youth; 11.3% elderly) in Polog region Target 300,000 (2023) 2. Number of municipalities in the Polog region with updated disaster preparedness plans and protocols Baseline: 0 (2018) Target: 9 (2022)	Project reports Maps of coverage of the early warning system (prepared in cooperation with the Hydro-meteorological Services) Preparedness plans and protocols developed for each municipality Reports summarizing results from the drills	Commitment to invest in disaster preparedness on central and local level is high Coordination mechanisms among different institutions before, during and aftermath crisis situations are in place (e.g., Crisis Management Centre, Directorate for Rescue and Protection), municipalities...) Hydro-meteorological Service engages in the maintenance of the automatic river monitoring system, ensures long-term financing for its operation, and provides access to accurate data to all relevant entities included in functioning of the early warning system.

	3. Improved institutional response to future flood events (measured during simulated scenarios as part of drills) Baseline: 4 on the scale of 10 (2018) Target: 7 on the scale of 10 (2023)		
Outcome 3: Priority flood risk mitigation measures informed by international best practices are implemented to effectively reduce future risks in the Polog region **(SECO & SDC)**	1. Number of persons (disaggregated by sex, vulnerable groups, urban/rural communities) benefitting from locally implemented DRR measures *Baseline 15,400 (49.8% women, 35.4% youth; 11.3% elderly),* *Target 211,852 (2023)* Avoided damages/losses from likely future flood events as a result of the implemented flood risk mitigation measures *Baseline: TBD by end of March 2022* *Target: TBC by end of March (2023)*	Project reports Combined flood hazard/risk maps with demographic and social data Simulated damages/losses under different scenarios (with and without measures) Relevant studies and technical documentation commissioned by the project	The necessary funding (donor and partner contributions) are secured for the capital investments Permitting procedures are efficiently implemented and access is secured to the future construction sites Long-term financing is secured for the maintenance of the built structures
Outcome 4: National legal and regulatory framework for disaster risk reduction is improved in line with the Sendai Framework and the EU Floods Directive and risk financing and risk transfer mechanisms are conceptualized **(SECO & SDC)**	1. Number of relevant documents (strategies, plans, roadmaps) that mainstream flood risk/disaster risk reduction in line with the Sendai Framework and the EU Floods Directive, on national and local level Baseline: 3 (2018) Target: 10 (2023) 2. Value of investments for flood risk reduction measures by the central and local governments in the Polog region	EU legislation compliance reports prepared by the Ministry of Environment and Physical Planning Government reports with financial data on public expenditures in flood risk mitigation Reports by Insurance Supervision Agency on changes in market penetration of flood insurance products Project reports Municipal financial reports on budget expenditures	EU integration processes remain high on the country's development agenda Government institutions understand the value of the national level strategy and action plan and the economic logic behind risk mitigation investments There is high-level government support for improving financing instruments for flood risk mitigation and flood preparedness (in light of multitude of competing priorities)

	Baseline: 200,000$ (2021) Target: 500,000$ (2023) 3. Formal inter-municipal body in place and operational Baseline: Not in place (2018) Target: In place (2023) 4. Different risk financing and risk transfer options for the country developed Baseline: Limited risk financing mechanisms and low penetration of insurance product on the market (2018) Target: Different options for flood risk financing and flood risk transfer analysed and dialogue for selection of the most appropriate one (s) facilitated (2023)	Flood risk financing and risk transfer report Reports form policy dialogues	There is willingness among government institutions to support the enhancing the insurance market by improving regulations (e.g., to promote mandatory insurance)
Outcome 5: Key stakeholders at central and local levels have improved knowledge on DRR/flood risk management and prototyped innovative practices will serve as models for replication **(SECO & SDC)**	1. Number of municipal staff with increased knowledge on flood risk management Baseline: Limited knowledge and understanding on flood risk management/DRR – 4 on the scale of 10 (2018) Target: Increased knowledge and understanding on flood risk management/DRR – 8 on the scale of 10 (2023)	Project reports Surveys	There is political will and professional interest of personnel charged with flood risk management/DRR responsibilities to engage in project-backed capacity development activities There are funding opportunities for replication/scaling-up initiatives

	2.% of public aware of flood/disaster risk in the Polog region Baseline: Low level of awareness– 3 on the scale of 10 (2018) Target: Increased awareness – 7 on the scale of 10 (2023) 2. Number of replications of concepts /models prototyped by the project in the country and/or in the region Baseline: 0 (2018) Target: At least two country-level replications of project-backed prototypes/models (2023)			
Output	**Output Indicators**	**Targets**	**Data Sources**	**(Assumptions & Risks)**
For Outcome 1: Authorities and communities have improved understanding of flood risks in the Polog region and capacity to manage them in an informed manner				
Output 1.1 A Flood Risk Management Plan for the Polog region is established in accordance with the EU Floods Directive and DRR principles **(SECO)**	1.1 Flood Risk Management Plan for the Upper Vardar Basin developed through a consultative process with key stakeholders	1.1.1 Flood risk management plan regularly updated (2021, 2023) 1.1.2 Flood hazard and flood risk maps for all nine municipalities of the Basin (2022)	Project Reports Flood Risk Management Plan and background documents	Same as for the respective Outcome
Output 1.2 Authorities are equipped with new knowledge to mainstream flood risk mitigation and DRR	1.2 Capacities of relevant authorities to mainstream flood risk mitigation and DRR priorities in future	1.2.1 At least 3 case studies completed on mainstreaming DRR/flood risk mitigation priorities in urban plans/planning documents (2022)	Project reports Urban or other planning documents on local level	Same as for the respective Outcome

priorities in future municipal urban and other development plans **(SECO)**	municipal urban and other development plans increased	1.2.2 Nine municipal flood defence plans aligned with the objectives of the FRMP (2022) 1.2.3 Guidance documents on risk-based urban planning developed (2023)	Case studies	
For outcome 2: Disaster preparedness of institutions and communities in the Polog region for effective response, recovery, rehabilitation and reconstruction is enhanced				
Output 2.1 Functional long-term floods early warning system for the Polog region is established **(SDC)**	2.1.1 Number of meteorological and hydrological monitoring stations made operational for the needs of the early warning system 2.1.2 Number of professional personnel (from Centre for Crisis Management, Directorate for Rescue and Protection, HMS, local governments trained on the application and maintenance of the early warning system	2.1.1 31 (2022) 2.1.2 40 (2023)	Project reports Reports by beneficiary institutions	Same as for the respective Outcome
Output 2.2 Flood disaster response capacity is improved through public awareness campaigns on early warning system and inclusive drills **(SDC)**	2.2.1 Changes in the community awareness about flood preparedness (population with improved knowledge) 2.2.2 Number of drills implemented	2.2.1 Increased knowledge and understanding on preparedness to floods – 8 on the scale of 10 (2023) 2.2.2 Two (2022)	Community surveys Project reports	Same as for the respective Outcome
For outcome 3: Priority flood risk mitigation measures informed by international best practices are implemented to effectively reduce future risks in the Polog region				
Output 3.1 Urban resilience is improved through implementation of priority state-of-the-art flood risk mitigation measures **(SECO)**	3.1 Number of priority flood risk mitigation measures in urban areas implemented 3.2 Number of urban resilience measures implemented in Tetovo and Gostivar	3.1.1 At least 3 priority flood risk mitigation measures in urban areas implemented (2022) 3.1.2 At least one priority measures for urban resilience measures implemented in Tetovo and in Gostivar (2023)	Project reports Technical documentation and as built reports	Same as for the respective Outcome

Output 3.2 Rural communities have increased resilience to floods through practical application of targeted low-cost nature-based measures **(SDC)**	3.2.1 Number of nature-based measures implemented in rural areas 3.2.2 Number of hectares reforested as anti-erosive measure 3.2.3 Size of rural population benefiting from the implemented measures 3.2.4 Number of persons benefiting from and integrated flood/torrent management in Poroj	3.2.1 Seven (3 landslides stabilized, 4 restoration of riverbeds) (2023) 3.2.2 Two ha (2023) 3.2.3 13 500 (2023) 3.2.4 3,862 (2023)	Project reports Technical documentation and as built reports	Same as for the respective Outcome
For outcome 4: National legal and regulatory framework for disaster risk reduction is improved in line with the Sendai Framework and the EU Floods Directive and risk financing and risk transfer mechanisms are conceptualized				
Output 4.1 National legal and regulatory framework for flood risk management is harmonized with the EU Floods Directive **(SDC)**	4.1.1 Strategy and action plan for flood risk mitigation 4.1.2 Number of government entities involved in the preparation of the legislation and strategy/action plan as part of an interactive capacity development exercise 4.1.3 Number of persons/professional personnel from governmental entities (M/F) who have built their capacity in disaster risk management	4.1.1 Adopted strategy by MoEPP (2023) 4.1.2 14 (2023) 4.1.3 30 (2023)	Ministry reports for compliance Project reports Legal acts	Same as for the respective Outcome
Output 4.2 National stakeholders for disaster risk reduction and	4.2.1 Platform for strategic dialogue established and operational	4.2.1 May 2022		

development partners established strategic dialogue on the development of the national DRR system and financial resource mobilization	4.2.2 Number of platform meetings	4.2.2 At least 2 per year		
Output 4.3 Risk financing and risk transfer mechanisms are conceptualized and advocated to become part of the national-level flood risk mitigation strategy **(SECO)**	4.2. 1 Roadmap and Implementation Plan for risk financing and risk transfer developed and consulted with the key stakeholders	4.2.1 Gap analysis targeting existing financial capacities and instruments vis-à-vis the actual needs is conducted 4.2.2 Risk financing / risk transfer models and corresponding institutional arrangements are formulated, and communicated with stakeholders 4.2.3 Series of policy dialogues on central and local level organized (2022)	Project reports Roadmap and Implementation Plan	Same as for the respective Outcome
For outcome 5: Key stakeholders at central and local levels have improved knowledge on DRR/flood risk management and prototyped innovative practices will serve as models for replication				
Output 5.1 Project knowledge, lessons learnt, and best practices are systematized and shared nationally and internationally **(SECO & SDC)**	5.1.1 Number of knowledge products drafted and presented 5.1.2 Thematic lessons learned from the relevant project interventions 5.1.3 Number of documents mainstreaming gender considerations	5.1.1 At least 7 (2023) 5.1.2 At lease 2 thematic lessons learned captured and shared with relevant national stakeholders (2023 5.1.3 20 (2023)	Project reports Different knowledge products (e.g., guidance documents, manuals, case studies, best practice reports)	Same as for the respective Outcome

VI. MONITORING AND EVALUATION

In accordance with UNDP's programming policies and procedures, the project will be monitored through the following monitoring and evaluation plans: *[Note: monitoring and evaluation plans should be adapted to project context, as needed]*

Monitoring Plan

Monitoring Activity	Purpose	Frequency	Expected Action	Partners (if joint)	Cost (if any)
Track results progress	Progress data against the results indicators in the RRF will be collected and analysed to assess the progress of the project in achieving the agreed outputs.	Quarterly, or in the frequency required for each indicator.	Slower than expected progress will be addressed by project management.		N/A
Monitor and Manage Risk	Identify specific risks that may threaten achievement of intended results. Identify and monitor risk management actions using a risk log. This includes monitoring measures and plans that may have been required as per UNDP's Social and Environmental Standards. Audits will be conducted in accordance with UNDP's audit policy to manage financial risk.	Quarterly	Risks are identified by project management and actions are taken to manage risk. The risk log is actively maintained to keep track of identified risks and actions taken.		N/A
Learn	Knowledge, good practices and lessons will be captured regularly, as well as actively sourced from other projects and partners and integrated back into the project.	At least annually	Relevant lessons are captured by the project team and used to inform management decisions.		
Annual Project Quality Assurance	The quality of the project will be assessed against UNDP's quality standards to identify project strengths and weaknesses and to inform management decision making to improve the project.	Annually	Areas of strength and weakness will be reviewed by project management and used to inform decisions to improve project performance.		N/A
Review and Make Course Corrections	Internal review of data and evidence from all monitoring actions to inform decision making.	At least annually	Performance data, risks, lessons and quality will be discussed by the project board and used to make course corrections.		N/A
Project Report	A progress report will be presented to the Project Board and key stakeholders, consisting of progress data showing the results achieved against pre-	Semi-annually, annually, and at the	Slower than expected progress will be timely addressed (semi-annual report)		N/A

	defined annual targets at the output level, the annual project quality rating summary, an updated risk long with mitigation measures, and any evaluation or review reports prepared over the period.	end of the project (final report)	Lessons learnt will be captured to be used by other similar projects (final report)		
Project Review (Project Board)	The project's governance mechanism (i.e., project board) will hold regular project reviews to assess the performance of the project and review the Multi-Year Work Plan to ensure realistic budgeting over the life of the project. In the project's final year, the Project Board shall hold an end-of project review to capture lessons learned and discuss opportunities for scaling up and to socialize project results and lessons learned with relevant audiences.	Specify frequency (i.e., at least annually)	Any quality concerns or slower than expected progress should be discussed by the project board and management actions agreed to address the issues identified.		N/A

VII. MULTI-YEAR WORK PLAN [67]

All anticipated programmatic and operational costs to support the project, including development effectiveness and implementation support arrangements, need to be identified, estimated and fully costed in the project budget under the relevant output(s). This includes activities that directly support the project, such as communication, human resources, procurement, finance, audit, policy advisory, quality assurance, reporting, management, etc. All services which are directly related to the project need to be disclosed transparently in the project document.

EXPECTED OUTPUTS	PLANNED ACTIVITIES	Planned Budget by Year		RESPONSIBLE PARTY	PLANNED BUDGET		
		2022	2023		Funding Source	Budget Description	Amount
Output 1.1 A Flood Risk Management Plan for the Polog Region is established in accordance with the EU Floods Directive and DRR principles Gender marker: 2	Activity 1.1.1 Formulation of a flood risk management planning base	40,000.00	63,700.00	UNDP	SECO	71200 International Consultants	103,700.00
		393,103.00			SECO	72100 Contractual Services - Companies	393,103.00
	Sub-Total for Output 1.1	**433,103.00**	**63,700.00**				**496,803.00**
Output 1.2: Authorities are equipped with new knowledge to mainstream flood risk mitigation and DRR priorities in future municipal urban and other development plans (SECO) Gender marker: 2	Activity 1.2.1 Mainstreaming DRR/flood risk management into urban and other development plans at local level		20,000.00	UNDP	SECO	71200 International Consultants	20,000.00
		110,000.00			SECO	72100 Contractual Services - Companies	110,000.00
	Sub-Total for Output 1.2	**110,000.00**	**20,000.00**				**130,000.00**
Output 2.1 Functional long-term floods early warning system for the Polog region is established (SDC) Gender marker: 2	Activity 2.1.1 Re-activation and upgrade of the meteorological and hydrological monitoring system and operationalizing a flash-flood early warning and public alert system and support to CMC	210,000.00	20,000.00	UNDP	SDC	72100 Contractual Services - Companies	230,000.00

[6] Cost definitions and classifications for programme and development effectiveness costs to be charged to the project are defined in the Executive Board decision DP/2010/32

[7] Changes to a project budget affecting the scope (outputs), completion date, or total estimated project costs require a formal budget revision that must be signed by the project board. In other cases, the UNDP programme manager alone may sign the revision provided the other signatories have no objection. This procedure may be applied for example when the purpose of the revision is only to re-phase activities among years.

	Sub-Total for Output 2.1	**210,000.00**	**20,000.00**				**230,000.00**
Output 2.2 Flood disaster response capacity is improved through public awareness campaigns on early warning system and inclusive drills (SDC) Gender marker: 2	Activity 2.2.1 Conducting a nation-wide public awareness campaign on flood risk management, flood preparedness and early warning systems	125,000.00		UNDP	SDC	71200 Local Consultants	125,000.00
	Activity 2.2.2 Community capacity-building on flood preparedness, response and early-warning system for the Polog Region	15,000.00			SDC	72100 Contractual Services - Companies	15,000.00
	Sub-Total for Output 2.2	**140,000.00**	**-**				**140,000.00**
Output 3.1 Urban resilience is improved through implementation of priority state-of-the-art flood risk mitigation measures (SECO) Gender marker: 2	Activity 3.1.1 Design and implementation of priority urban resilience building measures	1,901,320.00	1,660,593.97	UNDP	SECO	72100 Contractual Services - Companies	3,561,913.97
		20,000.00		UNDP	SDC	71200 International Consultants	20,000.00
	Sub-Total for Output 3.1	**1,921,320.00**	**1,660,593.97**				**3,581,913.97**
Output 3.2 Rural communities have increased resilience to floods through practical application of targeted low-cost nature-based measures (SDC) Gender marker: 2	Activity 3.2.1 Design and implementation of priority rural resilience building measures	1,195,000.00	1,029,645.00	72100	SDC	72100 Contractual Services - Companies	2,224,645.00
	Sub-Total for Output 3.2	**1,195,000.00**	**1,029,645.00**				**2,224,645.00**
Output 4.1 National legal and regulatory framework for flood risk management is harmonized with the EU Floods Directive (SDC) Gender marker: 2	Activity 4.1.1 Strengthening the legal and institutional enabling environment for integrated flood risk management	60,000.00		72100	SECO	72100 Contractual Services - Companies	60,000.00
	Activity 4.1.2 Outlining a national-level flood risk mitigation strategy and action plan	70,000.00	53,711.00	72100	SDC	72100 Contractual Services - Companies	123,711.00

	Support DRR platform for strategic dialogue and coordination Activity 4	25,760.00	25,760.00	72100	SDC	72100 Contractual Services - Companies	51,520.00
	Total for Output 4	**155,760.00**	**79,471.00**				**235,231**
Output 5.1 Project knowledge, lessons learnt, and best practices are systematized and shared nationally and internationally (SECO & SDC) Gender marker: 2	Activity 5.1.3 Communication and advocacy for future replication and scaling-up are promoted	24,100.00	20,000.00	72100	SECO	72100 Contractual Services - Companies	44,100.00
		50,000.00	29,901.00	72100	SDC	72100 Contractual Services - Companies	79,901.00
	Total for Output 5	**74,100.00**	**49,901.00**				**124,001.00**
Management Support	Salaries and DPC	67,048.56	66,925.92	61100	SECO	61100 Salary Cost - NP staff	133,974.48
		66,926.68	57,067.00	62100	SECO	61200 Salary Cost - GS staff	123,993.68
		2,672.08	2,672.08	64300	SECO	Direct project cost	5,344.16
		46,268.72	56,350.86	71400	SECO	71400 Contractual Services Individual	102,619.58
		23,227.75	23,227.75	61100	SDC	61100 Salary Cost - NP staff	46,455.50
		18,527.75	18,547.75	61200	SDC	61200 Salary Cost - GS staff	37,075.50
		12,127.00	7,000.00	64300	SDC	Direct project cost	19,127.00
		46,269.00	56,350.86	71400	SDC	71400 Contractual Services Individual	102,619.86
	Office costs	500.00	331.00	72200	SDC	Equipment and Furniture	831.00
		500.00	331.00	72400	SDC	Communication & Audio Visual Equipment	831.00
		500.00	331.00	72500	SDC	Supplies	831.00
		500.00	331.00	72800	SDC	Information Technology Equipment	831.00
		3,000.00	1,308.00	73400	SDC	Rental and Maintenance of other equipment	4,308.00
		4,000.00	1,308.00	74200	SDC	Translation costs	5,308.00

		3,000.00	1,308.00	74500	SDC	Miscellaneous Expenses	4,308.00
		5,000.00	5,000.00	72200	SECO	Equipment and Furniture	10,000.00
		6,000.00	6,000.00	72400	SECO	Communication & Audio Visual Equipment	12,000.00
		3,000.00	3,000.00	72500	SECO	Supplies	6,000.00
		6,000.00	6,000.00	72800	SECO	Information Technology Equipment	12,000.00
		25,000.00	25,000.00	73100	SECO	Rental & Maintenance-Premises	50,000.00
		6,484.85	6,485.00	73400	SECO	Rental and Maintenance of other equipment	12,969.85
		15,000.00	15,000.00	74200	SECO	Translation costs and publication of materials	30,000.00
		10,000.00	10,000.00	74500	SECO	Miscellaneous Expenses	20,000.00
	Total Management Costs	**371,552.39**	**369,875.22**			**Total Management costs**	**741,427.62**
						Sub Total SECO	*4,809,719.00*
						GMS SECO	*384,442.00*
						Sub Total SDC	*3,092,302.86*
						GMS SDC	*247,889.30*
		4,610,835.39	**3,293,186.19**			Total SECO/SDC	**7,904,021.59**
		415,641.18	**216,689.85**			Total GMS	**632,331.30**
		5,026,476.57	**3,509,876.04**			**TOTAL FOR 2022**	**8,536,352.89**

Remark:

In line with the General Assembly Resolution 72/279, 1 % of UN coordination levy applies to additional SDC contribution in total amount of 22,256 USD

VIII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

The basic project management structure, based on the latest results-based management approaches, is presented in Figure 6 which clearly displays the role of a wide range of partners during project implementation. The key governing structure of the project will be the Project Board (PB) comprising representatives of the MoEPP, the Swiss Embassy (representing SDC and SECO), UNDP, and basin municipalities. The PB composition will remain the same for both projects under the program (SDC and SECO funded) due to programmatic complementarities, implementation arrangements and institutional responsibilities.

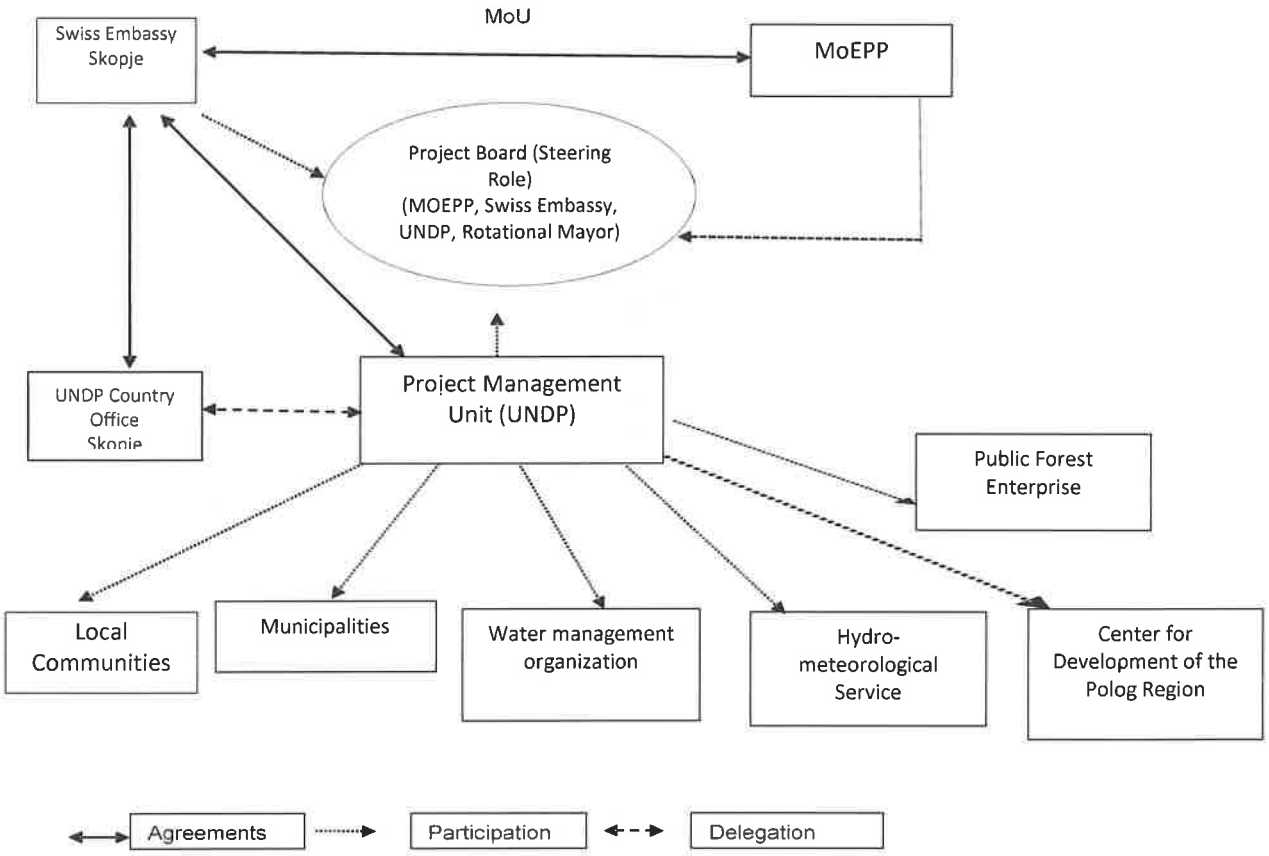

Fig. 6. Project governance structure

The Project Board (Figure 7) is the group responsible for making management decisions by consensus when guidance is required by the Project Manager, including approval of project work plans and their revisions. In order to ensure accountability, the Project Board (PB) decisions will be made in accordance with highest standards of integrity and transparency.

Besides approving the Annual Work Plans (AWP), the PB also authorizes any major deviation(s) from original plans. The PB also ensures that required resources are committed, arbitrates any conflicts within the project and negotiates solutions to any problems between the project team and external bodies. In addition, it approves any delegation of Project Assurance responsibilities.

The Executive function will be held by the MoEPP. Its role is to ensure that the project is focused throughout its life cycle on achieving its objectives and delivering outputs that will contribute to higher-level outcomes. The Executive ensures that the project gives value-for-money, oversees a cost-conscious approach to the project and balances the beneficiary-supplier demands.

The interests of project beneficiaries in the PB will be represented by the mayors of the basin municipalities. The participation of mayors in the PB will be on a rotational basis (each year a mayor of a different municipality will take part in the PB based on an internal agreement among mayors of the participating municipalities).

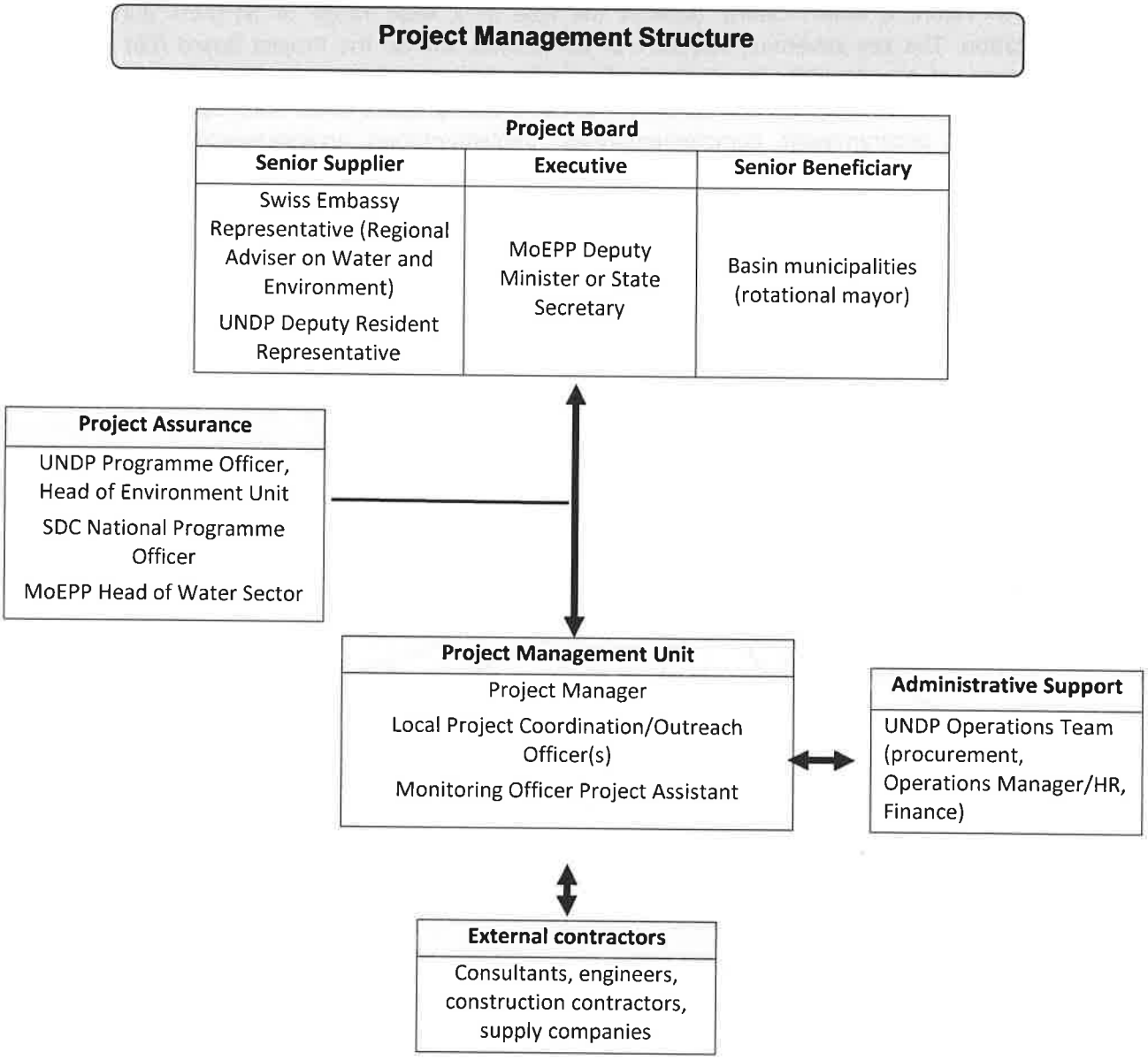

Fig.7 Project implementation team

UNDP's internal project management resources from the Environment and Disaster Risk Reduction Practice Area will be engaged for the needs of project implementation. The Project Management Unit will be shared equally between the two components of the programme (SECO and SDC).

The project will be staffed by a Project Manager a Project Assistant, Monitoring Officer experienced in construction contract monitoring and management, and shared Communication Officer (50:50) based in UNDP Country Office, as well as Local Project Coordination/Community Outreach Officer(s), who will be based in the region (local project office in Tetovo). If deemed necessary, depending on the workload during different stages of project implementation the project may consider strengthening implementation capacities by including additional staff (e.g., Monitoring Officer, Project Specialist, Community Outreach / Communications Officer) with the necessary qualifications based on the nature of required capacities.

Besides its role in the PB, the MoEPP will also designate a responsible person (coordinator) to provide additional quality assurance for the project.

IX. LEGAL CONTEXT

This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government and UNDP, signed on 30 October 1995.

UNDP as the Implementing Partner shall comply with the policies, procedures and practices of the United Nations safety and security management system.

UNDP agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via hthttp://www.un.org/sc/committees/1267/aq_sanctions_list.shtml. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

The project will also comply with the Cost-sharing Agreements signed between SECO and UNDP, SDC and UNDP.

X. RISK MANAGEMENT

1. UNDP as the Implementing Partner will comply with the policies, procedures and practices of the United Nations Security Management System (UNSMS.)

2. UNDP as the Implementing Partner will undertake all reasonable efforts to ensure that none of the [project funds] [UNDP funds received pursuant to the Project Document] are used to provide support to individuals or entities associated with terrorism , that the recipients of any amounts provided by UNDP hereunder do not appear on the United Nations Security Council Consolidated Sanctions List, and that no UNDP funds received pursuant to the Project Document are used for money laundering activities. The United Nations Security Council Consolidated Sanctions List can be accessed via https://www.un.org/securitycouncil/content/un-sc-consolidated-list. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

3. Social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (http://www.undp.org/ses) and related Accountability Mechanism (http://www.undp.org/secu-srm).

4. UNDP as the Implementing Partner will: (a) conduct project and programme-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the project or programme to comply with such standards, and (c) engage in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.

5. In the implementation of the activities under this Project Document, UNDP as the Implementing Partner will handle any sexual exploitation and abuse ("SEA") and sexual harassment ("SH") allegations in accordance with its regulations, rules, policies and procedures.

6. All signatories to the Project Document shall cooperate in good faith with any exercise to evaluate any programme or project-related commitments or compliance with the UNDP Social and Environmental Standards. This includes providing access to project sites, relevant personnel, information, and documentation.

7. UNDP as the Implementing Partner will ensure that the following obligations are binding on each responsible party, subcontractor, and sub-recipient:

a. Consistent with the Article III of the SBAA [or the Supplemental Provisions to the Project Document], the responsibility for the safety and security of each responsible party, subcontractor and sub-recipient and its personnel and property, and of UNDP's property in such responsible party's, subcontractor's and sub-recipient's custody, rests with such responsible party, subcontractor and sub-recipient. To this end, each responsible party, subcontractor and sub-recipient shall:

i. put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;

ii. assume all risks and liabilities related to such responsible party's, subcontractor's and sub-recipient's security, and the full implementation of the security plan.

b. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the responsible party's, subcontractor's and sub-recipient's obligations under this Project Document.

c. Each responsible party, subcontractor and sub-recipient (each a "sub-party" and together "sub-parties") acknowledges and agrees that UNDP will not tolerate sexual harassment and sexual exploitation and abuse of anyone by the sub-parties, and other entities involved in Project implementation, either as contractors or subcontractors and their personnel, and any individuals performing services for them under the Project Document.

(a) In the implementation of the activities under this Project Document, each sub-party shall comply with the standards of conduct set forth in the Secretary General's Bulletin ST/SGB/2003/13 of 9 October 2003, concerning "Special measures for protection from sexual exploitation and sexual abuse" ("SEA").

(b) Moreover, and without limitation to the application of other regulations, rules, policies and procedures bearing upon the performance of the activities under this Project Document, in the implementation of activities, each sub-party, shall not engage in any form of sexual harassment ("SH"). SH is defined as any unwelcome conduct of a sexual nature that might reasonably be expected or be perceived to cause offense or humiliation, when such conduct interferes with work, is made a condition of employment or creates an intimidating, hostile or offensive work environment. SH may occur in the workplace or in connection with work. While typically involving a pattern of conduct, SH may take the form of a single incident. In assessing the reasonableness of expectations or perceptions, the perspective of the person who is the target of the conduct shall be considered.

d. In the performance of the activities under this Project Document, each sub-party shall (with respect to its own activities), and shall require from its sub-parties (with respect to their activities) that they, have minimum standards and procedures in place, or a plan to develop and/or improve such standards and procedures in order to be able to take effective preventive and investigative action. These should include: policies on sexual harassment and sexual exploitation and abuse; policies on whistleblowing/protection against retaliation; and complaints, disciplinary and investigative mechanisms. In line with this, sub-parties will and will require that their respective sub-parties will take all appropriate measures to:

(i) Prevent its employees, agents or any other persons engaged to perform any services under this Project Document, from engaging in SH or SEA;

(ii) Offer employees and associated personnel training on prevention and response to SH and SEA, where sub-parties have not put in place its own training regarding the prevention of SH and SEA, sub-parties may use the training material available at UNDP;

(iii) Report and monitor allegations of SH and SEA of which any of the sub-parties have been informed or have otherwise become aware, and status thereof;

(iv) Refer victims/survivors of SH and SEA to safe and confidential victim assistance; and

(v) Promptly and confidentially record and investigate any allegations credible enough to warrant an investigation of SH or SEA. Each sub-party shall advise UNDP of any such allegations received and investigations being conducted by itself or any of its sub-parties with respect to their activities under the Project Document, and shall keep UNDP informed during the investigation by it or any of such sub-parties, to the extent that such notification (i) does not jeopardize the conduct of the investigation, including but not limited to the safety or security of persons, and/or (ii) is not in contravention of any laws applicable to it. Following the investigation, the relevant sub-party shall advise UNDP of any actions taken by it or any of the other entities further to the investigation.

e. Each sub-party shall establish that it has complied with the foregoing, to the satisfaction of UNDP, when requested by UNDP or any party acting on its behalf to provide such confirmation. Failure of the

relevant sub-party to comply of the foregoing, as determined by UNDP, shall be considered grounds for suspension or termination of the Project.

f. Each responsible party, subcontractor and sub-recipient will ensure that any project activities undertaken by them will be implemented in a manner consistent with the UNDP Social and Environmental Standards and shall ensure that any incidents or issues of non-compliance shall be reported to UNDP in accordance with UNDP Social and Environmental Standards.

g. Each responsible party, subcontractor and sub-recipient will take appropriate steps to prevent misuse of funds, fraud, corruption or other financial irregularities, by its officials, consultants, subcontractors and sub-recipients in implementing the project or programme or using the UNDP funds. It will ensure that its financial management, anti-corruption, anti-fraud and anti money laundering and countering the financing of terrorism policies are in place and enforced for all funding received from or through UNDP.

h. The requirements of the following documents, then in force at the time of signature of the Project Document, apply to each responsible party, subcontractor and sub-recipient: (a) UNDP Policy on Fraud and other Corrupt Practices (b) UNDP Anti-Money Laundering and Countering the Financing of Terrorism Policy; and (c) UNDP Office of Audit and Investigations Investigation Guidelines. Each responsible party, subcontractor and sub-recipient agrees to the requirements of the above documents, which are an integral part of this Project Document and are available online at www.undp.org.

i. In the event that an investigation is required, UNDP will conduct investigations relating to any aspect of UNDP programmes and projects. Each responsible party, subcontractor and sub-recipient will provide its full cooperation, including making available personnel, relevant documentation, and granting access to its (and its consultants', subcontractors' and sub-recipients') premises, for such purposes at reasonable times and on reasonable conditions as may be required for the purpose of an investigation. Should there be a limitation in meeting this obligation, UNDP shall consult with it to find a solution.

j. Each responsible party, subcontractor and sub-recipient will promptly inform UNDP as the Implementing Partner in case of any incidence of inappropriate use of funds, or credible allegation of fraud, corruption other financial irregularities with due confidentiality.

Where it becomes aware that a UNDP project or activity, in whole or in part, is the focus of investigation for alleged fraud/corruption, each responsible party, subcontractor and sub-recipient will inform the UNDP Resident Representative/Head of Office, who will promptly inform UNDP's Office of Audit and Investigations (OAI). It will provide regular updates to the head of UNDP in the country and OAI of the status of, and actions relating to, such investigation.

UNDP will be entitled to a refund from the responsible party, subcontractor or sub-recipient of any funds provided that have been used inappropriately, including through fraud corruption, other financial irregularities or otherwise paid other than in accordance with the terms and conditions of this Project Document. Such amount may be deducted by UNDP from any payment due to the responsible party, subcontractor or sub-recipient under this or any other agreement. Recovery of such amount by UNDP shall not diminish or curtail any responsible party's, subcontractor's or sub-recipient's obligations under this Project Document.

k. Each contract issued by the responsible party, subcontractor or sub-recipient in connection with this Project Document shall include a provision representing that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the proposal, have been given, received, or promised in connection with the selection process or in contract execution, and that the recipient of funds from it shall cooperate with any and all investigations and post-payment audits.

l. Should UNDP refer to the relevant national authorities for appropriate legal action any alleged wrongdoing relating to the project or programme, the Government will ensure that the relevant national authorities shall actively investigate the same and take appropriate legal action against all individuals found to have participated in the wrongdoing, recover and return any recovered funds to UNDP.

m. Each responsible party, subcontractor and sub-recipient shall ensure that all of its obligations set forth under this section entitled "Risk Management" are passed on to its subcontractors and sub-recipients and that all the clauses under this section entitled "Risk Management Standard Clauses" are adequately reflected, mutatis mutandis, in all its sub-contracts or sub-agreements entered into further to this Project Document.