

Concept Note

Enhancing Climate Resilience in the Third Pole

Afghanistan, Bangladesh, Bhutan, Myanmar, Nepal | World Meteorological Organization (WMO)

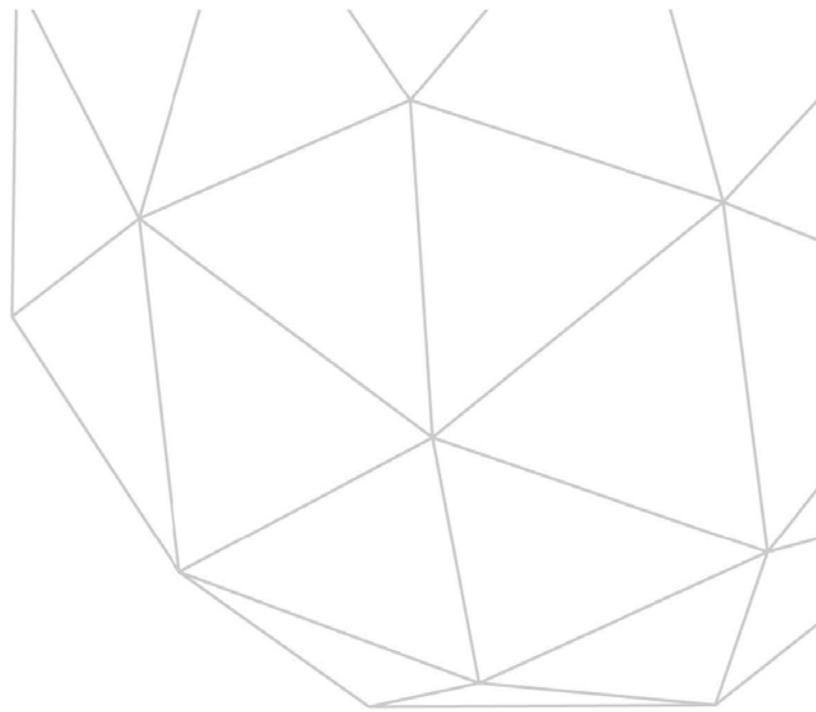
22 November 2016



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Concept Note

The Green Climate Fund (GCF) is seeking high-quality projects or programmes.

Accredited entities may choose to submit a concept note, in consultation with the relevant national designated authority, to present the proposed project or programme idea in order to receive early feedback and recommendation.

Project/Programme Title: Enhancing Climate Resilience in the Third Pole

Country/Region: Region: Third Pole (Hindu-Kush Himalayan Region),
Countries: Afghanistan, Bangladesh, Bhutan, Myanmar, Nepal

Accredited Entity: World Meteorological Organization (WMO)

National Designated Authority: His Excellency Prince Mostapha Zaher,
Mr. Mohammad Mejbahuddin,
Mr. Sonam Wangchuk,
Mr. Hla Maung Thein,
Mr. Baikuntha Aryal

Please submit the completed form to fundingproposal@gcfund.org¹

A. Project / Programme Information	
A.1. Project / programme title	Enhancing Climate Resilience in the Third Pole
A.2. Project or programme	Programme
A.3. Country (ies) / region	Region: Third Pole (Hindu-Kush Himalayan Region) Countries: Afghanistan, Bangladesh, Bhutan, Myanmar and Nepal
A.4. National designated authority(ies)	<p>Afghanistan: National Environmental Protection Agency, His Excellency Prince Mostapha Zaher</p> <p>Bangladesh: Economic Relations Division, Ministry of Finance, Mr. Mohammad Mejbahuddin</p> <p>Bhutan: Gross National Happiness Commission, Mr. Sonam Wangchuk</p> <p>Myanmar: Ministry of Environmental Conservation and Forestry, Mr. Hla Maung Thein</p> <p>Nepal: International Economic Cooperation Coordination Division, Ministry of Finance Mr. Baikuntha Aryal</p>
A.5. Accredited entity	World Meteorological Organization (WMO)
A.6. Executing entity / beneficiary	<p>Executing Entities:</p> <ul style="list-style-type: none"> • WMO, • National Meteorological and Hydrological Services (NMHSs) of the Programme countries, • India Meteorological Department (IMD), • Beijing Climate Center (BCC), • International Centre for Integrated Mountain Development (ICIMOD), • Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), • International Commission on Irrigation and Drainage (ICID), • International UN Organizations: Food and Agriculture Organization of the UN (FAO), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Climate Research Programme (WCRP)/ Global Energy and Water Exchange (GEWEX).
A.7. Access modality	Direct <input type="checkbox"/> International <input checked="" type="checkbox"/>
A.8. Project size category (total investment, million USD)	Micro (≤ 10) <input type="checkbox"/> Small ($10 < x \leq 50$) <input checked="" type="checkbox"/> Medium ($50 < x \leq 250$) <input type="checkbox"/> Large (> 250) <input type="checkbox"/>
A.9. Mitigation / adaptation focus	Mitigation <input type="checkbox"/> Adaptation <input checked="" type="checkbox"/> Cross-cutting <input type="checkbox"/>
A.10. Public or private	public
A.11. Results areas	<i>Which of the following targeted results areas does the proposed project/programme address?</i>

¹ Please use the following naming convention for the file name: “[CN]-[Agency short name]-[Date]-[Serial number]” (e.g. CN-ABC-20150101-1).

<p>(mark all that apply)</p>	<p>Reduced emissions from:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Energy access and power generation (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.) <input type="checkbox"/> Low emission transport (E.g. high-speed rail, rapid bus system, etc.) <input type="checkbox"/> Buildings, cities, industries and appliances (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.) <input type="checkbox"/> Forestry and land use (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.) <p>Increased resilience of:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Most vulnerable people and communities (E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.) <input checked="" type="checkbox"/> Health and well-being, and food and water security (E.g. climate-resilient crops, efficient irrigation systems, etc.) <input type="checkbox"/> Infrastructure and built environment (E.g. sea walls, resilient road networks, etc.) <input type="checkbox"/> Ecosystems and ecosystem services (E.g. ecosystem conservation and management, ecotourism, etc.)
<p>A.12. Project / programme life span</p>	<p>5 years</p>
<p>A.13. Estimated implementation start and end date</p>	<p>Start: January 2018 End: January 2023</p>

B. Project/Programme Details

The Fund requires the following preliminary information in order to promptly assess the eligibility of project/programme investment. These requirements may vary depending on the nature of the project/programme.

<p>B.1. Project / programme description (including objectives)</p>	<p>The Hindu Kush-Himalayan region, also known as Third Pole, has a fragile ecosystem and is the source of the 10 major rivers that provide irrigation, power and drinking water for 1.3 billion people. The Third Pole includes areas in Afghanistan, Bangladesh, Bhutan, China, India, Kyrgyzstan, Mongolia, Myanmar, Nepal, Pakistan, Tajikistan, and Uzbekistan. Changes in its cryosphere will affect the whole region and beyond. Given the transboundary nature, addressing these challenges will demand a regional approach.</p> <p>Climate change is already having visible and pronounced impacts on snows and glaciers that are likely to increase the possibilities of Glacier Lake Outburst Floods (GLOFs). The region is suffering from the impacts of increased frequency of extreme weather events, such as landslides, floods and droughts. In Nepal only, the impact of climate change amounts to 1.5 to 2% of current GDP/year or even higher in some years. The complex terrain of the Third Pole region, dotted by high mountains, adds another dimension of vulnerability of the communities to climate variability and change.</p> <p>The proposed Programme seeks to strengthen the use of weather, water and climate services in the Third Pole region to adapt to climate variability and change and to apply well-informed risk management approaches and will be implemented under the umbrella of the Global Framework for Climate Services (GFCS). The proposed Programme reflects the recommendations stemming from the “Regional Consultation on Climate Services for the Third Pole and other High</p>
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Mountain Regions”² that was held on 9-11 March 2016 in Jaipur, India. The consultation brought together experts from the NMHSs and key decision-makers and practitioners from the five priority areas of the GFCS (agriculture and food security, energy, health, water and disaster risk reduction).

The Programme’s objectives will be achieved by strengthening regional support networks and institutional capacities, developing tools and products that are needed for anticipating climate variability and change. The primary measurable benefits include approximately 260 million direct and 1.3 billion indirect beneficiaries from the region who will gain access to critical weather and climate information, which will result in reduced disaster risk, improved water resources management and improved agricultural productivity.

The regional component is complemented by a continuum of synergistic national components in each of the countries within the Third Pole region. The activities that will be implemented at the national level will demonstrate the value of effective application/integration of the enhanced capacity at regional level that will result in improved agricultural production, reduced disaster risk and improved water management in least developed countries (LDCs) in the Third Pole (Afghanistan, Bangladesh, Bhutan, Nepal and Myanmar).

The Programme is aligned with the Intended Nationally Determined Contributions (INDCs) of LDCs in the Third Pole (Afghanistan, Bangladesh, Bhutan, Nepal and Myanmar) which place agriculture followed by disaster risk reduction and water as top priority sectors for adaptation actions.

The Programme has three main **objectives**:

1. Enhance climate information services to better anticipate the effects of climate change on the cryosphere for vulnerability and adaptation assessment and planning;
2. Improve early warning for extreme weather/climate events (i.e. heatwaves, droughts, GLOFs, landslides, etc.) to reduce the impacts of disasters on human lives and livelihoods;
3. Strengthen the provision and use of weather and climate services for agricultural risk management and water management.

The proposed Programme will consist of the following **components**:

1. **Enhancement of climate services capacities at a regional level (towards Objective 1).**

This will include the following activities:

Activity 1.1: The establishment of a WMO accredited Regional Climate Center (RCC) Network for the Third Pole and a Regional Climate Outlook Forum (Forum):

WMO RCCs are Centres of Excellence that create regional products including long-range forecasts that support regional and national activities and thereby strengthen capacity of NMHSs in a given region to deliver the best climate services to national users. This Programme will support the establishment of a Third Pole region RCC Network by enhancing synergies between existing centers and NMHSs in the region. The RCC functionalities will be therefore shared across these centers who will collectively work in synergy to deliver regional climate products.

This Programme will also support the development of a sustainable Regional Climate Outlook Forum to: produce regional climate outlooks based on input - climate predictions - from experts from the region as well as international experts and; explain to users the implications of the outlooks on climate-sensitive sectors and how to use this information. The Forum will improve access to and awareness of

the use of climate information by vulnerable sectors and populations. Linkages with other ongoing climate outlook forums in the region will also be established.

The Forum could also be used as an opportunity to stage training events for NMHS staff members who plan to attend, similar to the method used for the recent MedCOF for the Mediterranean region.

Activity 1.2: The enhancement of observations and related data management and linkages with existing observation programmes:

A comprehensive understanding of the extent and nature of changes in glaciers, snow cover, and permafrost in relation to weather, water and climate conditions can support downstream water resources management and planning. Due to the complex terrain of the Third Pole region, ground-based observations are incomplete and insufficient (almost absent above 4000 a.s.l). Access to this data is often limited. In addition the lack of availability in digital form of long term climate data from the target countries and others in the region hampers the development of a robust knowledge about climatological context of the trends and variations in the contemporary observed meteorological and hydrological parameters. The Programme will enhance observations by enhancing the integration of data from existing in-situ and remote sensing observations as well as model outputs and reanalyses. Based on the assessment of existing data and observations gathered, this activity will consider procurement of new equipment for the enhancement of the observations network in the region. Activity 1.2 will also include a sub-activity to support a region wide data modernisation project involving data recovery, data management systems and data exchange in the region that would benefit the outcome of the programme in the target countries (Activity 1.2.1). Activity 1.2 will be coordinated with the Global Cryosphere Watch³, the World Hydrological Observing System⁴ (WHYCOS) and the World Climate Services Programme of WMO⁵ to ensure quality, standardization, integration, management and access.

Activity 1.3: Harnessing climate predictions and climate research outcomes to improve climate services:

This activity will help improve understanding of: weather and climate processes over the complex Himalayan terrain, the glacier/climate interaction, and the impacts of the changes of the cryosphere and high mountain hydrological process on water availability. This activity will help to better model and predict such changes and improve climate services for the water, disaster risk reduction and agricultural sectors.

Activity 1.4: Capacity development:

This activity will support enhancing the capacity at regional level for the provision and use of climate services, it will include strengthening the capacity of NMHSs staff to use the products from the newly established RCC network and other global centers; training of the users of climate services so they better understand the benefits and limitations of climate services and provision of guidance on how to use the products and services; and training to support the capacity development needs emerging from the other activities. Training, conducted in collaboration with WMO Regional Training Centres (RTCs)⁶, will be both face-to-face and web-based distance learning courses through WMO Distance Learning Platform. Resources from course offerings will be packaged to support future events and as input for regional universities and training centre curricula.

Activity 1.5: Establishment and Operation of a Regional Flood Information System in the Hindu Kush Himalaya region:

The increased frequency and intensity of floods in the region calls for the need to strengthen flood forecasting capacities by establishing a regional flood system that takes a basin-wide approach, given the transboundary nature of such problems. This

3 <http://globalcryospherewatch.org/>

4 <http://www.whycos.org>

5 <http://www.whycos.org>

6 <http://www.wmo.int/pages/prog/dra/etrp/rpcs.php>

activity will include: expansion of hydrological and meteorological networks at the national level and review of regional cooperation mechanisms; production of quality real-time data and models for flood forecasting in the Programme countries and dissemination of flood products at the national and regional levels.

Activity 1.6: Development of seamless sub-seasonal to seasonal river forecasting for the Ganges-Brahmaputra transboundary river basin to improve risk management of water resources (scarcity to flooding) under a regime of climate variability and change:

This activity will include: hydrological monitoring (river discharge, rainfall, temperature, etc.), development of a coupled climatological-meteorological-hydrological modelling for the entire basin, risk and vulnerability mapping, and development and implementation of an early warning system to provide impact-based warnings that can be readily used by disaster management agencies.

2. Enhancement of service delivery and warnings in Third Pole LDCs (Afghanistan, Bangladesh, Bhutan, Nepal and Myanmar) (towards Objective 2 and 3).

This will include the following activities:

Activity 2.1: The development of early warning systems for extreme events including climate watch systems:

This activity will consist in: strengthening the provision of weather and climate services by the NMHSs with regards to early warnings on extreme weather (1-10 days) and climate (1-3 months) events.

This activity will be implemented in: Afghanistan, Bangladesh, Bhutan, Myanmar, and Nepal, to directly support their INDCs implementation⁷ and as necessary underlying activity for the implementation of activities 2.2 and 2.3. In addition, National climate Outlook Forums (NCOFs) will be implemented as a mechanism to deliver early warnings on climate extremes to climate-sensitive user sectors.

Activity 2.2: The development of weather and climate advisory services for the agriculture sector:

This activity will focus on: development of agricultural advisories targeted for specific crops and at different agro-ecological zones for better farming practices including pest and disease outbreak warnings and planting and harvesting advice (NMHSs directly working with Ministry of Agriculture) and developing a dissemination system through Agromet Advisory Bulletins, Crop Weather Outlooks, and farmers' workshops.

This activity will be implemented in: Bhutan and Myanmar, to directly support their INDCs implementation⁸.

Activity 2.3: The development of early warning systems and management of water resources:

This activity will focus on: hydrological data rescue and the enhancement/establishment of a climatological and hydrological database at national level; coupled climatological-meteorological-hydrological modelling for small catchments; mapping of inundation, vulnerability and risk for key damage centres; development of an early warning system for floods and droughts.

This activity will be implemented in: Afghanistan, Bangladesh, Bhutan, and Myanmar, to directly support their INDCs implementation⁹.

⁷ Section 3.4 on page 11 of Bangladesh INDC, Section on "Priority adaptation needs" on page 5 of Bhutan INDC, Section D. on page 11 of Nepal INDC.

⁸ Section on "Priority adaptation needs" on page 5 of Bhutan INDC, Section 3.2 page 10 of Myanmar INDC.

⁹ Section on "Adaptation needs and means of implementation" on page 5 of Afghanistan INDC, Section 3.4 on page 11 of Bangladesh INDC, Section on "Priority adaptation needs" on page 5 of Bhutan INDC, Section 3.2 page 10 of Myanmar INDC.

	<p>Activities 2.1, 2.2 and 2.3 will also focus on improving the user-provider interface as one of the necessary elements to enhance uptake and use of climate and weather information and services.</p>
<p>B.2. Background information on project/programme sponsor</p>	<p>WMO is the sponsor for the proposed Programme. WMO has extensive experience in developing and implementing projects to support the application of meteorological, hydrological and climate knowledge and services for decision making including for adaptation to climate change and disaster risk reduction in developing countries. In particular, WMO has years of experience in implementing similar projects in the region and in the countries covered by the Programme:</p> <ul style="list-style-type: none"> • With funding from the United States Agency for International Development (USAID), WMO is currently implementing the South Asia Flash Flood Guidance System (SAsiaFFGS) in Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka and the project on Capacity Building of Afghanistan Meteorological Service for the Hydro-meteorological Early Warnings. • With funding from Environment Canada, WMO is implementing the Programme for implementing the Global Framework for Climate Services (GFCS) at regional and national scales (together with RIMES, as one of the partners). • The Hindu Kush Himalayan Hydrological Cycle Observing System (HKH-HYCOS) project was initiated in May 2001 with the financial support of the United States Department of State (Regional Environmental Office for South Asia) and the USAID (2001-2005). The second phase (2009-2014) received support from the Ministry of Foreign Affairs, Government of Finland. The HKH-HYKOS was implemented in Bangladesh, Bhutan, China, India, Nepal and Pakistan together with ICIMOD. HKH-HYCOS phase 3 proposal is included in the proposed Programme as activity 1.5. • In the framework of the World Climate Research Programme (WCRP), WMO coordinates a number of projects to determine the predictability of climate and the effects of human activities on climate. <ul style="list-style-type: none"> ○ WCRP's core-project on Global Energy and Water Exchange (GEWEX) supports the International Network for Alpine Research Catchment Hydrology (INARCH) to improve understanding on the sensitivity of hydrological processes to climate change in high elevation snowy and glacierized headwater catchments, through a global network of cryospheric and hydrological research (including Nepal). Activity 1.2 and 1.3 would build on this. ○ A new GEWEX Hydro-climatology Panel (GHP) activity that looks at the anthropogenic component to land-atmosphere processes and hydrological processes related to water management focused initially on dams and reservoirs, as well as irrigation management and ground water extraction. ○ In addition, GHP's 'mountterrain' activity looks at precipitation (snow, ice and rain) in mountainous regions to improve observations and modelling as this is a critical component in assessing and predicting hydrological processes in a changing environment. ○ One or two new regional hydroclimate projects will be established in central and South East Asia with close collaboration of the international Third Pole Environment network¹⁰. ○ The WCRP Grand Challenge on Water for the Food Baskets of the World has selected Asia's rice and wheat producing regions as one of three initial focal areas. The new regional hydroclimate projects including the Asian one(s) will be charged with addressing water availability issues for food as one of the main objectives. • The Coastal Inundation Flood Demonstration Programme (CIFDP) Sub-Project in Bangladesh has been underway since 2011. With the support of USAID, the first phase was completed in 2013, and currently phase 2 of the technical development aspect is nearing completion in 2016, with a forecast simulation exercise.

¹⁰ <http://www.tpe.ac.cn>

	<ul style="list-style-type: none"> • With funding from Japan Meteorological Agency, WMO is implementing the project for the Installation of Himawari Cast Receiving and Processing Systems in Asia and South West Pacific (including Bangladesh and Myanmar). <p>The proposed Programme complements and builds on the results and lessons learnt from these projects¹¹.</p> <p>In addition, relevant experience from Programme’s partners include:</p> <ul style="list-style-type: none"> • Within the framework of UNESCO’s International Hydrological Programme (IHP) Snow Glacier and Water Resources Initiative, vulnerability mapping, assessment, glacier mass balance course and outreach activities will be undertaken. IHP will coordinate the following activities: education, capacity building training programmes, field course on glacier monitoring and mass balance and develop a set of benchmarks on vulnerabilities and adaptive capacities in the context of glacial lake outburst floods (GLOFs). Furthermore, training of multiple stakeholders to strengthen capacities to increase resilience to climate hazards based on the case studies will be implemented. This could contribute to Activities 1.2, 1.3, 1.4, 1.5, 1.6, 2.1 and 2.3. • RIMES is supporting the development of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) resolution 71/12 approved in 2015 to establish an inter-governmental platform of hydrologist, meteorologist and disaster risk management professionals drawn from the operational organizations (NMHSs and disaster risk management agencies) of the riparian countries of Ganges Brahmaputra and Indus river-basins. This could contribute to Activity 1.5. • RIMES has established and operationalized a seamless seasonal flood outlook (10 days and 5 days) flood forecast for Bangladesh. This could contribute to Activity 1.6. <p>WMO is a public entity and doesn’t have an equity investment strategy. However, WMO in collaboration with its partners will provide project development and management support and in-kind contribution through making available its staff and systems. For instance, WMO will contribute with the Capacity Building of Afghanistan Meteorological Service for the Hydro-meteorological Early Warnings project funded by USAID and a consultant currently developing an implementation plan to implement the recommendations from the Regional Consultation on Climate Services for the Third Pole. IMD, an implementing partner, will contribute with staff dedicated to the Programme.</p>
<p>B.3. Market overview</p>	<p>The public goods nature of the proposed Programme entails no revenue-generation or cost-recovery. The financial market overview is not applicable.</p> <p>The products generated by the proposed programme include tailored agricultural advisories, warnings and advisories. These products are relevant for: (a) MSEs such as small-scale farmer enterprises, agri-businesses; (b) Public sector agencies and private service providers in sectors such as agriculture, water management, energy, transportation, telecommunications, and tourism.</p>
<p>B.4. Regulation, taxation and insurance</p>	<p>NOT APPLICABLE</p>
<p>B.5. Implementation arrangements</p>	<p>As the Accredited Entity, WMO responsibilities will be: (i) Programme implementation oversight and supervision, including financial management; and (ii) Programme progress monitoring and evaluation oversight.</p> <p>The Programme will be managed by a Project Manager (at P4 level¹², located at WMO in Geneva) and national project officers located in the field (P3 level).</p> <p>The proposed Programme will be led by WMO and implemented jointly with the implementing partners (executing entities listed in 1.6). Implementing partners will be responsible for specific activity (ies):</p> <ul style="list-style-type: none"> • India Meteorological Department (IMD): activity 1.1 and 2.2

¹¹ <http://public.wmo.int/en/projects>

¹² United Nations professional categories.

	<ul style="list-style-type: none"> • Beijing Climate Center (BCC): activity 1.1 • International Centre for Integrated Mountain Development (ICIMOD): activity 1.1, 1.2, 1.3, 1.5, 1.6, 2.1, 2.2 and 2.3 • Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES): activities 2.1, 2.2, 2.3 • International Commission on Irrigation and Drainage (ICID): activities 1.6, 2.1 and 2.3 • International UN Organizations: Food and Agriculture Organization of the UN (2.2), UNESCO IHP (1.2, 1.3 and 1.4, 2.1, 2.3), GEWEX/WCRP: activity 1.3 • NMHSs: components 1 and 2. <p>Implementing partners will be required to implement the Programme in compliance with WMO rules and regulations, policies and procedures. In legal terms, this will be ensured by Letter of Agreements which will be signed between WMO and the implementing partners to govern the use of the funds (once the funds are secured) and to specify the role of each partner.</p> <p>Component 1 and 2 will be implemented in parallel over the timeframe of the Programme.</p>
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C. Financing / Cost Information

<p>C.1. Description of financial elements of the project / programme</p>	<p>The funding requirements cover:</p> <ul style="list-style-type: none"> • Personnel: 5 national experts (P3 level, based in the region), 1 international expert (Program Manager at P4 level, based at WMO in Geneva) and 1 officer (financial and administrative officer at P2 level, based at WMO in Geneva) = 3.6 M • External Services (consultancies): 1.8 M • Investments (equipment, tools, etc.): 4 M • Other funding requirements (capacity development activities, events, workshops, travel, materials, IT support, overhead): 17.6 M
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		Financial Instrument	Amount	Currency	Tenor	Pricing	
<p>C.2. Project financing information</p>	<p>Total project financing (a) = (b) + (c)</p>					
	<p>(b) Requested GCF amount</p>	(i) Senior Loans	.....			( ) years	() %
		(ii) Subordinated Loans	.....			( ) years	() %
		(iii) Equity	.....				( ) % IRR
		(iv) Guarantees	.....			
		(v) Reimbursable grants *	.....		<u>million USD (\$)</u>		
		(vi) Grants *	.....	27.0			
<p><i>* Please provide detailed economic and financial justification in the case of grants.</i></p>							
		<p>Total Requested (i+ii+iii+iv+v+vi)</p>	27.0	<u>million USD (\$)</u>			

		Financial Instrument	Amount	Currency	Name of Institution	Seniority
	(c) Co-financing		.....	<u>Options</u>	.....
			.....	<u>Options</u>	.....
			.....	<u>Options</u>	.....
			.....	<u>Options</u>	.....
		In terms of in-kind contributions, IMD will contribute with staff dedicated to the Programme, WMO will contribute with Capacity Building of Afghanistan Meteorological Service for the Hydro-meteorological Early Warnings project funded by USAID and a consultant currently developing an implementation plan to implement the recommendations from the Regional Consultation on Climate Services for the Third Pole.				
	(d) Covenants					
	(e) Conditions precedent to disbursement	No conditions precedent to disbursement for WMO.				

D. Expected Performance against Investment Criteria

Please explain the potential of the Project/Programme to achieve the Fund's six investment criteria as listed below.

<p>D.1. Climate impact potential <i>[Potential to achieve the GCF's objectives and results]</i></p>	<p># (total) of direct beneficiaries (people): About 210 million¹³</p> <p>By implementing early warning systems in the five Programme countries, the proposed Programme will directly benefit the people living in those countries with improved access to weather, water and climate information. It has the potential to reduce loss of lives by saving an average of 7,100¹⁴ lives a year thanks to improved access to weather, climate and water information.</p> <p># (total) of indirect beneficiaries (people): About 1.3 billion¹⁵</p> <p>The Third Pole is the source of the 10 major rivers that provide irrigation, power and drinking water for 1.3 billion people. The proposed Programme will address the region's problems indirectly benefiting the people living in the region.</p>
<p>D.2. Paradigm shift potential <i>[Potential to catalyze impact beyond a one-off project or programme investment]</i></p>	<p>The proposed Programme has a high:</p> <p>Potential for scaling-up and replication: The development of regional tools and products as well as lessons learnt from the activities in the five Programme countries will allow for replicability of results with a potential multiplier effect to all the countries in the region. In particular, the regional component (1) will enhance climate services capacities at a regional level, enable the production of regional climate products through the newly established RCC network, facilitate access to the regional products</p>

¹³ <http://www.icimod.org/?q=3487>

¹⁴ The loss of life estimate is an annual estimate using the EMDAT database (<http://www.emdat.be>) that provides total number of deaths per country for the period from 1900 to 2016. Based on the assumption that there is a 30% effectiveness to prevent loss of life as a result of the early warning system, we have about 7,100 lives saved per year in total for the five Programme countries (Afghanistan, Bhutan, Bangladesh, Nepal, and Myanmar).

¹⁵ <http://www.icimod.org/?q=3487>

	<p>to all countries in the region (beyond the five Programme countries) and a broad pool of users (through the newly established Forum) and it will establish flood information systems that will serve other countries in the basin (beyond the five Programme countries). Moreover, the tools and products that will be developed at national level (in component 2) can be applied to other countries in the region given the similarities across the countries.</p> <p>Potential for knowledge and learning: The lessons learnt from the national component (1) will be shared with the other countries in the region and similar projects can be implemented in those other countries in the region. Similarly, lessons learnt will be beneficial to WMO when designing and implementing similar projects.</p> <p>Contribution to the creation of an enabling environment: By enhancing the capacities of existing national and regional institutions and the collaboration between them, the proposed Programme will contribute to create an enabling environment towards sustainable climate change adaptation.</p> <p>Contribution to regulatory frameworks and policies: Enhanced climate information will allow better understanding and anticipating the effects of climate change on the cryosphere for vulnerability and adaptation assessment and planning (as also stated in Afghanistan and Nepal INDCs). This information is fundamental for the development of regulatory and policy frameworks necessary for building adaptive capacities in various social and economic sectors. More specifically, enhanced climate information and services will support development of sectoral policies and regulations for improved water resource management, management of the energy sector, land use planning, disaster risk reduction, etc.</p>
<p>D.3. Sustainable development potential [Potential to provide wider development co-benefits]</p>	<p>The proposed programme is expected to yield sustainable development benefits by saving lives and assets and enhancing agricultural productivity, safety and water security.</p> <p>Weather, water and climate information are critical in supporting the achievement of the 2030 Sustainable Development Agenda, adopted in September 2015, as the majority of the 17 Goals are weather and climate sensitive. A changing climate leads to changes in the frequency, intensity, spatial extent, duration, and timing of extreme weather and climate events, and can result in unprecedented extreme weather and climate events (IPCC). Disasters can set development back to decades and can erase years of development gains. By equipping countries with better weather, water and climate information, countries can make better informed decisions in sectors sensitive to climate which can lead to substantial economic benefits and sustainable development (WMO, World Bank, USAID, Global Facility for Disaster Reduction and Recovery (2015): Valuing Weather and Climate: Economic Assessment of Meteorological and Hydrological Services¹⁶).</p> <p>The proposed programme will contribute to the Fund Level impacts:</p> <ul style="list-style-type: none"> • Economic co-benefits <ul style="list-style-type: none"> - Result in economic benefits to the agricultural sector thanks to increased agricultural productivity associated with improved climate information (i.e. in Indonesia increased access to climate information by farmers has brought to an increase of nearly 25% yearly corn harvest¹⁷). <p>Agriculture is a highly climate-sensitive sector which will directly benefit from enhanced weather, water and climate information from the proposed Programme. For example, in Nepal, the impact of climate change amounts to 1.5 to 2% of current GDP/year or even higher in some years. The Asian Development Bank estimated that Bangladesh may experience a 2% GDP annual loss due to climate change. In Bhutan, 56% of the population is engaged in the agricultural sector and 70% in Myanmar (which contributes to 32.9% of GDP).</p>

¹⁶ http://library.wmo.int/opac/index.php?lvl=notice_display&id=17225#.V_y23k3yILN

¹⁷ <http://gfcs-climate.org/node/603>

	<p>The IPCC WG II Report (2014) suggests that changing precipitation or melting snow and ice are altering hydrological systems, affecting water resources in terms of quantity and quality. In the long run, improved understanding on the sensitivity of hydrological processes to climate change, particularly the role of glaciers in the freshwater resources will help to forecast the future availability and vulnerability of water resources.</p> <ul style="list-style-type: none"> • Social co-benefits <ul style="list-style-type: none"> - Reduce loss of lives by saving an average of 7,100¹⁸ lives a year thanks to improved access to weather, climate and water information. <p>The Programme will develop early warning systems that have proven to be extremely effective to manage and mitigate a disaster's impact on society, economies, and environment. A survey of early warning systems shows gaps in the early warning systems coverage in the region and particularly in the five Programme countries¹⁹, which needs them the most.</p> <p>A recent UN report²⁰ shows that Asia is the region with more frequent hydro-meteorological events and greater numbers of people killed and affected than any other continent. In total, 2,495 weather-related disasters struck Asia between 1995 and 2015, affecting 3.7 billion people and killing a further 332,000 individuals.</p>
<p>D.4. Needs of recipient <i>[Vulnerability to climate change and financing needs of the recipients]</i></p>	<p>An analysis of INDCs of least developed countries (LDCs) in the Third Pole (Afghanistan, Bangladesh, Bhutan, Nepal and Myanmar) reveals that the countries' top priority sector for adaptation actions is agriculture followed by disaster risk reduction and water.</p> <p>In particular, the following priority adaptation needs were identified in the respective country's INDC:</p> <p>Afghanistan:</p> <ul style="list-style-type: none"> • Develop a system to monitor and assess vulnerability and adaptation to climate change; • Strengthen and expand meteorological and hydrological monitoring networks and services, including a national database to archive and store meteorological and hydrological data; • Plan for proper watershed management. <p>Bangladesh:</p> <ul style="list-style-type: none"> • Improve early warning systems for tropical cyclone, flood, flash flood and drought. <p>Bhutan:</p> <ul style="list-style-type: none"> • Increase resilience to the impacts of climate change on water security through Integrated Water Resource Management (IWRM) approaches including water resources monitoring, assessment, and mapping; • Promote climate resilient agriculture; • Strengthen resilience to climate change induced hazards through improved monitoring and detection of hydro-meteorological extremes and early warning systems; • Enhance climate information services for vulnerability and adaptation assessment and planning. <p>Nepal:</p>

¹⁸ See Footnote 5.

¹⁹ http://na.unep.net/siouxfalls/publications/early_warning.pdf

²⁰ http://www.unisdr.org/2015/docs/climatechange/COP21_WeatherDisastersReport_2015_FINAL.pdf

	<ul style="list-style-type: none"> • Conduct research and studies on loss and damage associated with climate change impacts, and develop and implement measures to reduce climate vulnerabilities; • Address climate-induced disasters in earthquake affected areas and rebuild Nepal better; • Enhance agricultural sector by adopting climate-friendly technologies and reducing climate change impacts; • Build capacity at institutional level. <p>Myanmar:</p> <ul style="list-style-type: none"> • Enhance resilience in the agriculture sector, developing early warning systems; • Enhance public health protection and water resource management. <p>The proposed Programme directly contributes to addressing the priority adaptation needs listed above by implementing activities which are included in the countries' INDCs.</p>
<p>D.5. Country ownership <i>[Beneficiary country ownership of project or programme and capacity to implement the proposed activities]</i></p>	<p>The proposed Programme reflects the recommendations stemming from the "Regional Consultation on Climate Services for the Third Pole and other High Mountain Regions" that was held on 9-11 March 2016 in Jaipur, India. The consultation brought together experts from the NMHSs and key decision-makers and practitioners from the five priority areas of the GFCS (agriculture and food security, energy, health, water and disaster risk reduction).</p> <p>The proposed Programme is coherent and aligns with the countries' national climate strategy and priorities in adaptation, as indicated in the countries' INDC.</p> <p>NMHSs of the five Programme countries are among the executing entities.</p>
<p>D.6. Effectiveness and efficiency <i>[Economic and financial soundness and effectiveness of the proposed activities]</i></p>	<p>The proposed Programme will build on existing institutions at national and regional level ensuring it to be cost-effective and sustainable.</p>

E. Brief Rationale for GCF Involvement and Exit Strategy

INDCs of the five Programme countries (Afghanistan, Bangladesh, Bhutan, Nepal and Myanmar) clearly state the need for international support and financial resources for addressing their adaptation needs (section D.4). GCF contribution is critical for the proposed Programme as national resources would not be sufficient.

The sustainability of the Programme will be ensured by building on existing institutions at national and regional level, enhancing their respective capacities, improving the collaboration among them (twinning arrangements between institutions) and building on successful examples of similar initiatives implemented in the region²¹. During Programme preparation, country ownership and sustainability aspects will be carefully looked at, to ensure that capacity at national level is enhanced and sustained beyond the Programme lifetime.

F. Risk Analysis

Financial and operational risks:

²¹ System developed by India Meteorological Department and Ministry of Agriculture to provide weather based agromet advisories to the farming community through free SMS
<http://imdagrmet.gov.in/farmer/FarmerRegistrationFrontpage/index.php>
http://www.iasri.res.in/ebook/TEFCPI_sampling/WEATHER%20FORECASTING%20AND%20AGROMET%20ADVISORY%20SERVICES%20IN%20INDIA.pdf
<https://csa.guide/csa/india-s-integrated-agro-meteorological-advisory-service-aas>

<p>1. Operational risks</p>		
<p>1.1. National commitment: Low commitment from the NMHSs staff and their key partners in the government</p>	<p>Low</p>	<p>WMO will ensure during the Programme preparation:</p> <ul style="list-style-type: none"> • Understanding and buy- in of the Programme at the highest government level as well as involvement of NMHSs and their key government partners in the planning and implementation phases. • All relevant partners (ministries, agencies, departments) are clearly identified, fully share the vision and goal of the Programme and are aware of their contribution to the Programme.
<p>1.2. Low regional commitment, especially for data sharing</p>	<p>Low to medium</p>	<p>During Programme preparation, WMO will assess country data policies, engage dialogue with countries on data sharing, as appropriate, and support the establishment of cooperation agreements for the sharing of data, which respect national policies.</p> <p>For making the existent data and knowledge available to the community WMO will continue a concerted global effort, to address climate change and associated high mountain hydrological processes that coincide with the concerns of the interested area of this project. It will also contribute to the more accurate dissemination of scientific findings to policy makers and stakeholders, regarding the relevance of mountain glaciers to water supply systems.</p>
<p>1.3. Low performance and delays in implementation</p>	<p>Low</p>	<p>WMO has extensive experience in successfully planning, implementing, monitoring and evaluating similar projects. However, during Programme design and planning, WMO will ensure the following in order to increase the performance of the Programme:</p> <ul style="list-style-type: none"> ▪ A team adequately staffed dedicated to Programme management ▪ A Programme governance structure and implementation arrangements understood by all implementing partners ▪ A clear Programme risks management framework that allows for an effective management of risks and impacts ▪ Capacity gaps of implementing partners assessed and addressed

2. Financial risks		
2.1. Low performance in managing project financial resources	Medium to Low	<p>Financial management systems of countries and implementing partners will be assessed to identify possible weaknesses and ensure compliance with WMO financial management system.</p> <p>During implementation, programmatic and financial monitoring/reviews will be conducted to ensure good management of Programme resources.</p>
2.2. Long term financial sustainability risks	Low	<p>See section E above;</p> <p>Additionally, resources required for Programme operation in the long run will be assessed and measures taken, as appropriate in collaboration with countries, to ensure the financial sustainability.</p>
3. Environmental and social risks	Low	<p>The Programme environmental and social outcomes are positive. The environmental and social (E&S) risks as per GCF E&S safeguards are insignificant. Nevertheless, such risk and impacts will be assessed during Programme preparation according to WMO approach to E&S risks.</p>

G. Multi-Stakeholder Engagement

A multi-stakeholder meeting was held in 2016: the “Regional Consultation on Climate Services for the Third Pole and other High Mountain Regions” that was held on 9-11 March 2016 in Jaipur, India. Experts from the NMHSs and key decision-makers and practitioners from agriculture and food security, energy, health, water and disaster risk reduction sectors were present.

Three stakeholder meetings will be held in the region bringing together NDAs, key stakeholders from the countries (Met Service and sector representatives), and partners to collect inputs to design the Programme, upon approval of the concept note and Project Preparation Funding (PPF) Application by GCF.

H. Status of Project/Programme

- 1) A pre-feasibility study is expected to be completed at this stage. Please provide the report in section J.
- 2) Please indicate whether a feasibility study and/or environmental and social impact assessment has been conducted for the proposed project/programme: Yes No
(If ‘Yes’, please provide them in section J.)
- 3) Will the proposed project/programme be developed as an extension of a previous project (e.g. subsequent phase), or based on a previous project/programme (e.g. scale up or replication)? Yes No
(If yes, please provide an evaluation report of the previous project in section J, if available.)

I. Remarks

J. Supporting Documents for Concept Note

- Map indicating the location of the project/programme
- Financial Model
- Pre-feasibility Study
- Feasibility Study (if applicable)
- Environmental and Social Impact Assessment (if applicable)
- Evaluation Report (if applicable)