AFB/PPRC.31/38
13 March 2023

Adaptation Fund Board
Project and Programme Review Committee
Thirty-first Meeting
Bonn, Germany, 21-22 March 2023

Agenda Item 6 e)

PROPOSAL FOR BANGLADESH, NEPAL

Background

1. The strategic priorities, policies and guidelines of the Adaptation Fund (the Fund), as well as its operational policies and guidelines include provisions for funding projects and programmes at the regional, i.e., transnational level. However, the Fund has thus far not funded such projects and programmes.

2. The Adaptation Fund Board (the Board), as well as its Project and Programme Review Committee (PPRC) and Ethics and Finance Committee (EFC) considered issues related to regional projects and programmes on a number of occasions between the Board's fourteenth and twenty-first meetings but the Board did not make decisions for the purpose of inviting proposals for such projects. Indeed, in its fourteenth meeting, the Board decided to:

> *(c) Request the secretariat to send a letter to any accredited regional implementing entities informing them that they could present a country project/programme but not a regional project/programme until a decision had been taken by the Board, and that they would be provided with further information pursuant to that decision*
>
> *(Decision B.14/25 (c))*

3. At its eighth meeting in March 2012, the PPRC came up with recommendations on certain definitions related to regional projects and programmes. However, as the subsequent seventeenth Board meeting took a different strategic approach to the overall question of regional projects and programmes, these PPRC recommendations were not included in a Board decision.

4. At its twenty-fourth meeting, the Board heard a presentation from the coordinator of the working group set up by decision B.17/20 and tasked with following up on the issue of regional projects and programmes. She circulated a recommendation prepared by the working group, for the consideration by the Board, and the Board decided:

> *(a) To initiate steps to launch a pilot programme on regional projects and programmes, not to exceed US$ 30 million;*
>
> *(b) That the pilot programme on regional projects and programmes will be outside of the consideration of the 50 per cent cap on multilateral implementing entities (MIEs) and the country cap;*
>
> *(c) That regional implementing entities (RIEs) and MIEs that partner with national implementing entities (NIEs) or other national institutions would be eligible for this pilot programme, and*
>
> *(d) To request the secretariat to prepare for the consideration of the Board, before the twenty-fifth meeting of the Board or intersessionally, under the guidance of the working*

group set up under decision B.17/20, a proposal for such a pilot programme based on consultations with contributors, MIEs, RIEs, the Adaptation Committee, the Climate Technology Centre and Network (CTCN), the Least Developed Countries Expert Group (LEG), and other relevant bodies, as appropriate, and in that proposal make a recommendation on possible options on approaches, procedures and priority areas for the implementation of the pilot programme.

(Decision B.24/30)

5. The proposal requested under (d) of the decision above was prepared by the secretariat and submitted to the Board in its twenty-fifth meeting, and the Board decided to:

(a) Approve the pilot programme on regional projects and programmes, as contained in document AFB/B.25/6/Rev.2;

(b) Set a cap of US$ 30 million for the programme;

(c) Request the secretariat to issue a call for regional project and programme proposals for consideration by the Board in its twenty-sixth meeting; and

(d) Request the secretariat to continue discussions with the Climate Technology Center and Network (CTCN) towards operationalizing, during the implementation of the pilot programme on regional projects and programmes, the Synergy Option 2 on knowledge management proposed by CTCN and included in Annex III of the document AFB/B.25/6/Rev.2.

(Decision B.25/28)

6. Based on the Board Decision B.25/28, the first call for regional project and programme proposals was issued and an invitation letter to eligible Parties to submit project and programme proposals to the Fund was sent out on 5 May 2015.

7. At its twenty-sixth meeting the Board decided to request the secretariat to inform the Multilateral Implementing Entities and Regional Implementing Entities that the call for proposals under the Pilot Programme for Regional Projects and Programmes is still open and to encourage them to submit proposals to the Board at its 27th meeting, bearing in mind the cap established by Decision B.25/26.

(Decision B.26/3)

8. At its twenty-seventh meeting the Board decided to:

(a) Continue consideration of regional project and programme proposals under the pilot programme, while reminding the implementing entities that the amount set aside for the pilot programme is US$ 30 million;

(b) Request the secretariat to prepare for consideration by the Project and Programme Review Committee at its nineteenth meeting, a proposal for prioritization among

regional project/programme proposals, including for awarding project formulation grants, and for establishment of a pipeline; and

(c) Consider the matter of the pilot programme for regional projects and programmes at its twenty-eighth meeting.

(Decision B.27/5)

9. The proposal requested in (b) above was presented to the nineteenth meeting of the PPRC as document AFB/PPRC.19/5. The Board subsequently decided:

(a) With regard to the pilot programme approved by decision B.25/28:

(i) To prioritize the four projects and 10 project formulation grants as follows:

1. If the proposals recommended to be funded in a given meeting of the PPRC do not exceed the available slots under the pilot programme, all those proposals would be submitted to the Board for funding;

2. If the proposals recommended to be funded in a given meeting of the PPRC do exceed the available slots under the pilot programme, the proposals to be funded under the pilot programme would be prioritized so that the total number of projects and project formulation grants (PFGs) under the programme maximizes the total diversity of projects/PFGs. This would be done using a three-tier prioritization system: so that the proposals in relatively less funded sectors would be prioritized as the first level of prioritization. If there are more than one proposal in the same sector: the proposals in relatively less funded regions are prioritized as the second level of prioritization. If there are more than one proposal in the same region, the proposals submitted by relatively less represented implementing entity would be prioritized as the third level of prioritization;

(ii) To request the secretariat to report on the progress and experiences of the pilot programme to the PPRC at its twenty-third meeting; and

(b) With regard to financing regional proposals beyond the pilot programme referred to above:

(i) To continue considering regional proposals for funding, within the two categories originally described in document AFB/B.25/6/Rev.2: ones requesting up to US$ 14 million, and others requesting up to US$ 5 million, subject to review of the regional programme;

(ii) To establish two pipelines for technically cleared regional proposals: one for proposals up to US$ 14 million and the other for proposals up to US$ 5 million, and place any technically cleared regional proposals, in those pipelines, in the

order described in decision B.17/19 (their date of recommendation by the PPRC, their submission date, their lower "net" cost); and

(iii) To fund projects from the two pipelines, using funds available for the respective types of implementing entities, so that the maximum number of or maximum total funding for projects and project formulation grants to be approved each fiscal year will be outlined at the time of approving the annual work plan of the Board.

(Decision B.28/1)

10. At its twenty-ninth meeting, having considered the comments and recommendation of the Project and Programme Review Committee, the Adaptation Fund Board decided:

(a) To include in its work plan for fiscal year 2018 a program of work amounting to US$ 30 million for the funding of regional project and programme proposals, as follows:

(i) Up to three proposals requesting up to US$ 5 million for funding;

(ii) One proposal requesting up to US$ 14 million of funding;

(iii) Up to five project formulation grant (PFG) requests, of up to US$ 100,000 each, for preparing project and programme concepts or fully-developed project documents requesting up to US$ 5 million of funding;

(iv) Up to five project formulation grant (PFG) requests, of up to US$ 100,000 each, for preparing project and programme concepts or fully-developed project documents requesting up to US$ 14 million of funding.

(Decision B.29/4)

11. At its thirty-first meeting, having considered the comments and recommendation of the Project and Programme Review Committee, the Adaptation Fund Board (the Board) decided:

(a) To merge the two pipelines for technically cleared regional proposals established in decision B.28/1(b)(ii), so that starting in fiscal year 2019 the provisional amount of funding for regional proposals would be allocated without distinction between the two categories originally described in document AFB/B.25/6/Rev.2, and that the funding of regional proposals would be established on a 'first come, first served' basis; and

(b) To include in its work programme for fiscal year 2019 provision of an amount of US$ 60 million for the funding of regional project and programme proposals, as follows:

(i) Up to US$ 59 million to be used for funding regional project and programme proposals in the two categories of regional projects and programmes: ones requesting up to US $14 million, and others requesting up to US$ 5 million; and

(ii) Up to US$ 1 million for funding project formulation grant requests for preparing regional project and programme concepts or fully-developed project and programme documents.

(Decision B.31/3)

12. According to the Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

13. The following project pre-concept document titled “Hydrological Status and Outlook system for Integrated Water Resources Management and Climate Resilience in Bangladesh and Nepal (HydroSOS- BaNe) was submitted for Bangladesh and Nepal by the World Meteorological Organization (WMO), which is a Multilateral Implementing Entity of the Adaptation Fund.

14. This is the first submission of the regional project pre- proposal using the three-step submission process.

15. The current submission was received by the secretariat in time to be considered in the fortieth Board meeting. The secretariat carried out a technical review of the project proposal, with the diary number AF00000337 and completed a review sheet.

16. In accordance with a request to the secretariat made by the Board in its 10th meeting, the secretariat shared this review sheet with WMO and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

17. The secretariat is submitting to the PPRC the summary and, pursuant to decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section. In accordance with decision B.25.15, the proposal is submitted with changes between the initial submission and the revised version highlighted.

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Pre-Concept for a Regional Project

Countries/Region: Bangladesh and Nepal
Project Title: Hydrological Status and Outlook System for Integrated Water Resources Management and Climate Resilience in Bangladesh and Nepal (HydroSOS-BaNe)
Thematic focal area: Disaster risk reduction and early warning systems
Implementing Entity: World Meteorological Organization (WMO)
Executing Entities: Bangladesh Meteorological Department (BMD), Bangladesh Water Development Board (BWDB), Department of Hydrology and Meteorology of Nepal
AF Project ID: AF00000337
IE Project ID: **Requested Financing from Adaptation Fund (US Dollars):** $12,090,000.00
Reviewer and contact person: Neranda Maurice-George **Co-reviewer(s):** Yuki Siga
IE Contact Person(s):

Technical Summary	The project "Hydrological Status and Outlook System for Integrated Water Resources Management and Climate Resilience in Bangladesh and Nepal (HydroSOS-BaNe)" aims to increase the climate adaptive capacities and resilience of beneficiary communities to hydro-climatic risks. This will be done through the **three** components below: Component 1: Risk-based preparedness and adaptation to the climate variabilities and water and environmental uncertainties (USD 3,000,000); Component 2: Strengthening water resources management through access to hydrometeorological information and augment regional /national capacity to monitor and assess Hydro-Meteorological hazards (USD 6,000,000); Component 3: Water and climate resilient regional cooperation arrangements together with National and regional stakeholders, and community involvement (USD 600,000). Requested financing overview: Project/Programme Execution Cost: USD 950,000 Total Project/Programme Cost: USD 11,150,000 Implementing Fee: USD 940,000 Financing Requested: USD 12,090,000

	The proposal includes a request for a project formulation grant and/or project formulation assistance grant of USD 20,000. The initial technical review raised some issues, such as improving the adaptation reasoning, demonstrating cost-effectiveness and referencing other relevant programmes ongoing in the region, as is discussed in the Clarification Requests (CRs) and Corrective Action Request (CAR) raised in the review. The final technical review finds that the CRs and CARs raised in the initial technical review have been addressed in the revised proposal.
Date	28 February 2023

Review Criteria	**Questions**	**Comments Initial technical Review**	**Comments final Technical Review**
Country Eligibility	1. Are all of the participating countries party to the Kyoto Protocol, or the Paris Agreement?	**Yes.**	**-**
	2. Are all of the participating countries developing countries particularly vulnerable to the adverse effects of climate change?	**Yes.** The pre-concept indicates that climate extremes specifically, floods and droughts have been identified for both Bangladesh and Nepal. Climate change effects are linked to dry season, water shortages and droughts, which is threatening livelihoods, food security and resulting in widespread migration. Ganga Brahmaputra Meghna (GBM) River Basin	**-**

Project Eligibility	1. Have the designated government authorities for the Adaptation Fund from each of the participating countries endorsed the project/programme?	**Yes.** As per the Endorsement letters dated 14th August 2022, for Bangladesh and 31st July 2022 for Nepal.	**-**
	2. Has the pre-concept provided necessary information on the problem the proposed project/programme is aiming to solve, including both the regional and the country perspective?	**Yes**. The pre-concept describes the increasing impact on a large number of poor and vulnerable persons living in the Ganga Brahmaputra Meghna (GBM) River Basin, due to climate change, which exacerbates vulnerabilities of the in the project countries. Notwithstanding, the proponent can further take into account the relevant ongoing GEF projects in the proposed countries as a baseline and consider synergy with them: - GEFID 10207 Building climate resilient livelihoods in vulnerable landscapes in Bangladesh (BCRL) ➔ EWS; institutional capacity building etc. - GEFID 10727 Managing Watersheds for Enhanced Resilience of Communities to Climate Change in Nepal (MaWRiN)	**CR1: Cleared.** As per additional information in review sheet and on pages 6-11 of resubmission.

		➔ WRM (floods, droughts etc.), NBS etc. - GEFID 6989 Developing Climate Resilient Livelihoods in the Vulnerable Watershed in Nepal ➔ WRM (floods and droughts) - GEFID 4551 Community Based Flood and Glacial Lake Outburst Risk Reduction ➔ Climate disaster (glacial Lake outburst flood) **CR1:** Please ensure that all relevant programmes and projects (past and ongoing) which can demonstrate complementarity and coherence are presented in the concept.	
	3. Have the project/programme objectives, components and financing been clearly explained?	**Partially.** The proposed objective is clear. However, the components and outputs can use further refining to clarify the scope/reach of the proposal: the entire GMB or the areas specific to the participating countries. It is noted that India and China were approached, however they have not presented endorsement letters for this concept. On refining the outputs please consider example output 1.1.1; 1.1.3; 3.2.2 as it relates to narrowing the scope. It would also be useful to strengthen the alignment of	**CR2: Cleared.** As per additional information provide in review sheet and on page 12 of resubmission. However, the concept note should explore options to enhance engagement and/or coordination with additional countries in the Ganga Brahmaputra Meghna (GBM) River Basin, and in particular India in order to improve the effectiveness of the proposed approach

		the components, outputs which will support the elaboration of properly linked activities for a coherent theory of change at the concept stage. **CR2:** Please consider including a Theory of Change in order to strengthen the linkages between the various elements of the project.	
	4. Has the project/programme been justified in terms of how: - it supports concrete adaptation actions? - it builds added value through the regional approach? - it promotes new and innovative solutions to climate change adaptation? - it is cost-effective? - it is consistent with applicable strategies and plans? - it incorporates learning and knowledge management? - it will be developed through a consultative process with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund?	**Partially.** Components 1 and 3 do not seem to address concrete adaptation action while component 2 does through output 2.2.1. The proposed project does provide added value through a multi-country approach and contributes to Disaster risk reduction and early warning systems; and Transboundary water management. The proposal also indicates that the project will incorporate learning and knowledge management and demonstrates that it was developed through a consultative process, including gender considerations. The proposal also indicates that at the national level, the project will be informed by key national documents e.g. Water Resources Strategy (WRS); Intended Nationally Determined Contributions (INDCs) and (National Adaptation Plans or NAP and National Adaptation Plans for Action or NAPA.) The pre-concept falls short of demonstrating that it	**CAR1: Cleared.** As per additional information in review sheet and on page 2 and 4 of the resubmission. **CR3: Cleared.** As per additional information in review sheet and pages 5 and 6 of the resubmission.

	- it will take into account sustainability?	provides a new and innovative solutions to climate change adaptation but indicates that sustainability will be taken into account. **CAR1:** Please include information to demonstrate the cost-effectiveness of the project. **CR3:** Please present information to demonstrate the level or innovation of the proposal.	
	5. Does the pre-concept briefly explain which organizations would be involved in the proposed regional project/programme at the regional and national/sub-national level, and how coordination would be arranged? Does it explain how national institutions, and when possible, national implementing entities (NIEs) would be involved as partners in the project?	**Yes.**	**-**
Resource Availability	6. Is the requested project / programme funding within the funding windows of the programme for regional projects/programmes?	**Yes.**	**-**

	7. Are the administrative costs (Implementing Entity Management Fee and Project/ Programme Execution Costs) at or below 10 per cent of the project/programme for implementing entity (IE) fees and at or below 10 per cent of the project/programme cost for the execution costs?	**Yes.** The Implementing Entity Management Fee is at 8.4% of the project/programme cost and the Project Execution Costs are at 8.5% of the project/programme cost.	**-**
Eligibility of IE	8. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	**Yes.**	**-**

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: HYDROSOS-BANE PRE-CONCEPT FOR A REGIONAL PROJECT

Comments from Adaptation Fund technical review	Response from the HydroSOS BaNe IE (WMO) and EEs
Comment 1: Notwithstanding, the proponent can further take into account the relevant ongoing GEF projects in the proposed countries as a baseline and consider synergy with them: - GEFID 10207 Building climate resilient livelihoods in vulnerable landscapes in Bangladesh (BCRL) ☒ EWS; institutional capacity building etc. - GEFID 10727 Managing Watersheds for Enhanced Resilience of Communities to Climate Change in Nepal (MaWRiN) ☒ WRM (floods, droughts etc.), NBS etc. - GEFID 6989 Developing Climate Resilient Livelihoods in the Vulnerable Watershed in Nepal ☒ WRM (floods and droughts) - GEFID 4551 Community Based Flood and Glacial Lake Outburst Risk Reduction ☒ Climate disaster (glacial Lake outburst flood) **CR1:** Please ensure that all relevant programmes and projects (past and ongoing)	**Response to CR1:** The proposed HydroSOS-BaNe project will ensure that the repeatability or duplication of the activities from the previously completed or on-going projects is avoided. However, existing resources, infrastructures and services from the past and planned projects will be used to build the capabilities of the communities and institutions involved in Flood and Drought management. Several other ways are being planned to ensure synergies, coordination and dissemination of the programme's outputs to a larger circle of institutions and communities: ● Stakeholders (vulnerable communities, local policy makers, development and humanitarian agencies) from the on-going projects as well as past ones will be involved in regular consultative meetings and implementation of activities to identify good practices, shortcomings, sharing of resources, and understand the short-term and long-term impacts ● An advisory committee will be set up including representatives from major ongoing and planned projects to share exchange of experience and methodologies, and to define coordination activities - expert groups will be created to discuss technical issues and provide advice to the executing entities ● A transboundary inception workshop will be held to share information on the proposed HydroSOS BaNe project and ensure a larger consultation with project stakeholders for better appreciation of existing resources and identify gaps ● A workshop involving all key representatives and international partners will be organized possibly at the next preparation phase as well as at the beginning of the project ● Consultation activities will be conducted with the representatives and focal point of other projects and beneficiaries' communities to determine the good practices, lessons learned, and possible gaps **A detailed table with synergies and complementarities with other on-going and completed projects (including GEF funded projects) in Bangladesh, Nepal and at the transboundary level is provided below under Annex 1.** **More information will be also provided in the concept note and project proposal stage ensuring direct consultations with the focal points of the on-going and completed projects and national agencies.**

which can demonstrate complementarity and coherence are presented in the concept.	
Comments 2: Partially. The proposed objective is clear. However, the components and outputs can use further refining to clarify the scope/reach of the proposal: the entire GMB or the areas specific to the participating countries. It is noted that India and China were approached, however they have not presented endorsement letters for this concept. On refining the outputs please consider example output 1.1.1; 1.1.3; 3.2.2 as it relates to narrowing the scope. It would also be useful to strengthen the alignment of the components, outputs which will support the elaboration of properly linked activities for a coherent theory of change at the concept stage. **CR2:** Please consider including a Theory of Change in order to strengthen the linkages between the various elements of the project.	**Response to CR2:** This HydroSOS BaNe project aims to enable different actors and stakeholders at regional, national and local level to manage climate, weather and water-related risks more effectively. This strategy recognizes that the current water crisis in the GBM basin is inextricably linked to climate change and requires systemic changes. This project plans to drive that change using an integrated climate and water approach to deal with increasing exposure to water related risks. A change of systems and mindset will be carried out by bringing together different disciplines in the water, climate and disaster management sectors and fostering collaboration amongst global, national and local partners which traditionally have been working separately. This will be done by breaking institutional barriers among sectors and organizations and establishing a model of cooperation that will enable different actors to achieve common goals. The broader aim is to forge new relationships that will deliver strategic results in future, and beyond this project. **A more detailed theory of change (ToC) is provided below in Annex 2.** National partners, including National Governments, Research Organizations, Private Sectors, etc. in each country will set their own roles and responsibilities around these focus areas, with decisions delegated as close to communities as possible. This will allow for maximum flexibility and impact depending on the available capacities in the country. The ToC will be refined by the country teams during the next preparation phase.
Comment and Clarification requests: Partially. Components 1 and 3 do not seem to address concrete adaptation action while component 2 does through output 2.2.1. The proposed project does provide added value through a multi-country approach and contributes to Disaster risk reduction and early warning systems, and Transboundary water management. The proposal also indicates that the project will incorporate learning and knowledge management and demonstrates that it was developed through a consultative process, including gender considerations. The proposal also indicates that at the national level, the project will be informed by key national documents e.g. Water Resources Strategy (WRS); Intended Nationally Determined Contributions (INDCs) and (National Adaptation Plans or NAP and National Adaptation Plans for	**Response to CAR1:** Until now, very little focus is found on determining the cost-effectiveness of climate change adaptation interventions across the GBM Basin as a whole. As a result, there is limited baseline information to be used for comparative analyses of approaches which are sustainable and replicable across the entire GBM region. In the HydroSOS BaNe project in Bangladesh and Nepal, new solutions will be implemented to improve risk reduction and climate change adaptation. Special attention will be given to promote community of users, guidance material, decision-support tools, online training, use of social networks and crowdsourcing. These solutions will be tailored according to the local needs and capacities, to account for social and cultural appropriateness. The HydroSOS End-to-End Early Warning Systems will be tested with additional climate projections to study the impact of future scenarios on spatial and urban planning and their consequences on socio-economic development. T**he basin scale approach with two countries is a suitable way to identify and implement cost-effective measures as countries in GBM region have similar challenges related to climate change events (floods and drought) that will be addressed through this projec**t. The proposed project's activities under each Component will promote improved coordination between regional, national and local institutions responsible for transboundary water management, disaster risk reduction and climate change adaptation. Through integration of previous knowledge and current projects of the two participating countries, the project will ensure minimum overlap and transfer of methodologies and skills from one area to the other. A regional approach results in greater co-benefits as compared to the national one because one set of resources generates productive

Action or NAPA.) The pre-concept falls short of demonstrating that it provides a new and innovative solutions to climate change adaptation but indicates that sustainability will be taken into account.

CAR1: Please include information to demonstrate the cost-effectiveness of the project.

CR3: Please present information to demonstrate the level or innovation of the proposal.

outcomes for two countries, which individual national projects would have achieved using more resources (human, time as well as material resources). Working at a regional level will allow the proposed project to reach several communities (rural, urban, semi-urban, transboundary, etc.) of the two countries with new methodologies and tools. The development and maintenance of End-to-End Early Warning System at the regional level and all related functionalities can be mutualized and shared depending on the individual needs and uses. The transboundary EWS dissemination strategies will determine the most efficient and effective ways to reach the remotest areas or the last-mile and will have broader coverage, so as to facilitate early warnings to the most vulnerable populations. The developed methodologies can be tested later at a larger scale within the basin, or easily adapted to similar types of environments at local or national level. It will thus create a community of users and will also foster the integration of socio-economic and environmental risks and climate change approaches at national, regional and local levels..

The NMHSs of the two countries being Member of WMO are familiar with coordination and participation issues of the national partners (Water Resources, Environment, Hydropower, Irrigation, Agriculture and Civil Defense, and to the regional organizations such as International Centre for Integrated Mountain Development (ICIMOD), Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) through the previous projects such as GEF-Funded projects, WMO HYCOS-HKH, Regional flood outlook for the Ganges and Brahmaputra River basins developed by ICIMOD, South Asia Flash Flood Guidance System (SAFFGS), IUCN BRIDGE GBM etc. The regional approach will bring the countries to work in a more coordinated way and additionally, transboundary support and actions will allow them to share data and information on weather, climate and water resources and avoid disaster impacts on environment, social and economic services in Bangladesh and Nepal.. The regional approach will enhance cost effectiveness of capacity development (at one time participants from two countries will be involved) as well as ensuring a certain level of generic scope of tools and methodologies developed for future application beyond the pilot testing sites. Centralizing the capacity building of the Hydro-Meteorological Agencies together with the regional body will enhance cost effectiveness.

HydroSOS BaNe project components	**Proposed project beneficiaries and benefits**	**Alternatives to proposed approach and cost**
Risk-based preparedness and adaptation to the climate variabilities and water and environmental uncertainties	Development of preparedness and adaptation measures based on dynamic risk assessment and risk-based plans. Differential risk identification and prioritization for vulnerable sections including gender, elderly, disabled. Capacity building at the local community level for making use of risk maps and available information	Risk reduction measures such as dams and reservoirs for flood control and irrigation have increased cost, limited benefits and detrimental environmental consequences Conventional risk maps fail to incorporate climate change induced risks and thus will be ineffective

	Incorporation of emerging risk from climate change perspective into development planning	
Strengthening water resources management through access to hydro-meteorological information and augment regional /national capacity to monitor and assess Hydro-Meteorological hazards	Regional level data sharing will help better utilization of water resources and climate change events Regional approach is critical to mitigate hydro-meteorological hazards through integrated approach to floods and drought monitoring and EWS Participation of communities in designing EWS for floods and droughts. Increasing productivity and better health and utility through access to water resources. Systematic documentation of climatic change effects and filling of gaps in existing observational network	National level EWS for flood and droughts are developed separately and operate independently without being integrated at the basin scale Water resource management framework is country specific and without real time data or meta-data sharing Techno-centric EWS installed without community consultation and participation leading to lack of effectiveness and ownership
Water and climate resilient regional cooperation arrangements together with National and regional stakeholders, and community involvement	Operationalization of an integrated Climate adaptation with disaster risk reduction approach at a regional and national levels Community empowerment through involvement in refining national and local policies for effective and efficient implementation of adaptation plan and development practices Sharing of knowledge and practices with other communities of the region	Disaster Risk Reduction and Climate Adaptation programs and policies executed separately without synergy and joint strategy Limited Community involvement and programs without integrating science based risk mapping and thus failing to be useful Community knowledge sharing is not provided with other neighboring countries/communities

Response to CR3:

	Innovations under component 1: The floods and drought risk maps, integrating environmental indicators to the more usual human and properties impact approaches, will be open-source and thus facilitate mainstreaming of results into other initiatives relating to Floods and Drought management or generally development processes in the target countries. Risk maps will be developed for both current and future projected climate changes and will be crucial for generating impact based forecasts for example for extreme floods and drought events. Coordinating with the countries will help promote adoption of risk assessment/mapping methodologies by other countries in the GBM (South Asia in general) which are also prone to Floods and Drought events. Community based flood management including nature-based solutions and gender mainstreaming in the selected communities will be useful to identify and design innovative solutions related to risks identification, adaptation measures and dissemination of warnings within communities and at local levels. Examples of locally-led adaptation actions through various HydroSOS BaNe project outputs may include: · Communities and individuals raising the level of houses to protect their lives and properties from flood hazards maps and awareness programme · Building of temporary structural measures such as dikes and levees, diversion of flood water etc. · Changing the agriculture patterns e.g. use of crops withstanding the excess water or reduced water · Enhanced water security through potable water with a focus on innovative water distribution and storage in water scarce rural areas, incl. through rainwater harvesting systems, solarized water systems, enhanced household water treatment and storage. · Promoting integrated water resource management in both drought and flood-prone landscapes through nature-based solutions such as watershed restoration, or water and soil conservation measures. Nature-based or green solutions will also be designed such as multipurpose green infrastructures, keeping in mind that they should be beneficial not only on the environmental, but also economic and social points of view. One could be for example to develop flooding areas during heavy rains that will be used as livelihood such as temporary fishing during monsoon or recreational areas during the dry season. **Innovation under component 2:** An integrated and state-of-the-art approach to flood and drought early warning systems is an immediate priority for the GBM countries (especially Bangladesh and Nepal) where timely and relevant information are lacking for impending hydro-meteorological hazards. To note, in these countries during a flooding situation, there can be a drought at the same time in another part of the country. An integrated approach to floods and drought monitoring and early warning systems will support national forecasters to observe and generate useful early warning services to the stakeholders. It must be underlined that the methods for producing warnings will differ depending on the characteristics of the hazard (flood or drought), as both hydrological extremes differ in their spatial and temporal distribution. Floods are relatively rapid events, caused by intense precipitation, limited in time and affecting localized areas as compared to drought. Whereas drought is a more slow induced event, and might have a much distributed impact both in area and time. On the one hand, the data needed to describe both phenomena can be partially

	shared, such as meteorological, hydrological and agronomical parameters. On the other hand, the methodology to forecast the two phenomena varies considerably and depends on the availability of different types of meteorological forecasts (from nowcasting for short pluvial events to seasonal and sub-seasonal forecasts for drought onset). The HydroSOS end-to-end hydrological and meteorological monitoring, forecasting and disseminating system will be innovatively designed will bring together existing knowledge, tools and approaches to develop composite products of hydrological and meteorological status and outlook through the implementation of the WMO Hydrohub (enhancing hydrological monitoring and data exchange) and World Hydrological Observing System (WHOS) mandate of standardization of data and information management systems. A detailed inventory of existing methodologies, equipment (hard and software), skills and operational procedures in the GBM countries will be conducted to build on available tools and products. The proposed system will provide possibilities to receive information from the users (crowdsourcing) about their observations during the floods and drought events. The web-based early warning system will be made compatible and scalable to integrate other hazards in future, such as fire, diseases etc. **Innovative approach under component 3**: The project will bring together policy-makers and decision makers to review, develop or refine existing policies on water management and disaster risk management following experiences and lesson learned from the outcome of component 1 and 2. This will allow developing regional/transboundary water management and climate adaptation plans and guidelines instead of only country specific. Flood management solutions will be also designed with communities, benefiting from existing capacities and traditional knowledge, together with recent innovations and lessons learnt from similar situations. Besides this, the project will provide support to land-use planning, alongside national and local authorities, also taking into account national and local policies (environmental regulations, building codes, etc), to areas at risk and help minimizing risks of disasters in coherence with local requirements.

Annex 1: Other ongoing or planned projects and programmes in Bangladesh and Nepal to build complementarities and coherence with the proposed HydroSOS-BaNe project

Projects/Objectives	Objectives/Description	Possible Synergies/Complementarities
The proponent can further take into account the relevant ongoing GEF projects in the proposed countries as a baseline and consider synergy with them:		
- GEFID 10207 Building climate resilient livelihoods in vulnerable landscapes in Bangladesh (BCRL) ☒ EWS; institutional capacity building etc.	The overarching objective of this project is to improve the resilience of people, communities, and ecosystems to climate change, and improve livelihoods through increased value addition in the agricultural food systems of Bangladesh. Outcome 1.1: Technologies and	Both projects will be able to learn from each other experiences and challenges, especially as stakeholders and partners will be invited to participate to the advisory committee of the HydroSOS BaNe project. A part of the results and methodologies of GEF BCRL project will be complementary to the

https://www.thegef.org/projects-operations/projects/10207	innovative solutions piloted or deployed to reduce climate-related risks and/ or enhance resilience Outcome 1.2: Innovative financial instruments and investment models enabled or introduced to enhance climate resilience	HydroSOS BaNe project as both projects aim at improving early warning: the type of information provided by the early warning system (EWS) could be integrated into HydroSOS EWS. The methodology for climate resilient crops warnings proposed in GEF BCRL project could be linked to HydroSOS similarly to an experiment on one of the pilot sites. Adaptation solutions of GEF BCRL to improve the resilience of communities and their livelihoods could be integrated while developing Components 1 and 2 and some of them could be further transferred in the different regions of the GBM Basin. Additionally, FAO could be one of the stakeholders to receive sub-seasonal to seasonal warnings and can take an active role into the dissemination of information with a wide range of local stakeholders (farmers groups, insurance company, private companies, etc.), including decision-makers from national/local agencies responsible for Flood and Drought Management.
- GEFID 10727 Managing Watersheds for Enhanced Resilience of Communities to Climate Change in Nepal (MaWRiN) ☒ WRM (floods, droughts etc.), NBS etc. https://www.worldwildlife.org/projects/managing-watersheds-for-enhanced-resilience-of-communities-to-climate-change-in-nepal-mawrin	The objective of this project is to enhance climate resilience of Indigenous people and local communities in the Marin watershed through nature-based solutions and livelihood diversification. The proposed requested GEF funding will help increase the resilience of the local communities of the Marin watershed in the face of long-term climate change and associated hazards such as landslides, floods, droughts and forest fires by reducing vulnerability, increasing adaptability, and improving the transfer and expansion of locally appropriate nature-based solutions.	This National project in Marin watershed of Nepal will be screened and synergies will be developed on the work proposed on improving vulnerabilities, increasing adaptability and NbS solutions in Nepal by developing implementation partnerships and using the methodologies and approaches proposed by the MaWRiN project partners possibly to other regions of Nepal and Bangladesh. WWF being technical partner of WMO will be invited to join as the technical partners or part of the advisory committee of the proposed HydroSOS BaNe
- GEFID 6989 Developing Climate Resilient Livelihoods in the Vulnerable Watershed in Nepal ☒ WRM (floods and droughts) https://www.thegef.org/projects-operations/projects/6989	To develop climate resilient community livelihoods through integrated watershed management practices Outcome 1.1: Technologies and innovative solutions piloted or deployed to reduce climate-related risks and/ or enhance resilience Outcome 1.2: Innovative financial instruments and investment models enabled or introduced to enhance climate resilience	Improved planning and management of water resources will help the communities in growing their livelihood and (agricultural) production. The HydroSOS BaNe project will provide necessary information on floods and drought EWS and indicators respectively, making the beneficiaries have timely knowledge and awareness on the impending events. The resilience approaches and methodologies of GEF project could be shared and integrated in the pilot testing locations of other countries of the HydroSOS BaNe

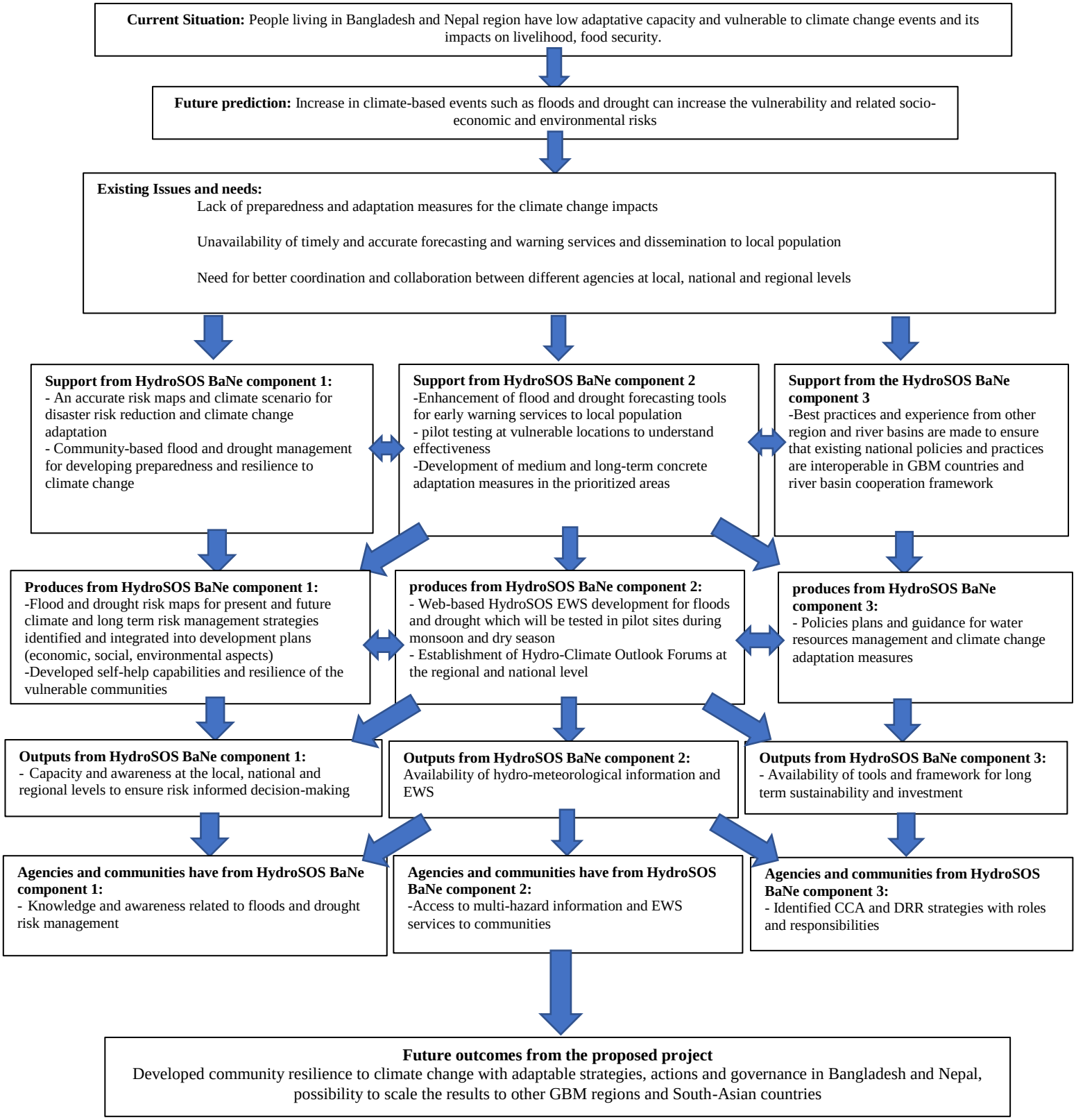
- GEFID 4551 Community Based Flood and Glacial Lake Outburst Risk Reduction ☒ Climate disaster (glacial Lake outburst flood) https://www.undp.org/nepal/projects/closed-community-based-flood-and-glacial-lake-outburst-risk-reduction-project	The objective of CFGORRP is to reduce human and material losses from Glacier Lake Outburst Flooding (GLOF) in Solukhumbu district and catastrophic flooding events in the Terai and Churia Range. For achieving this objective, the Project has been streamlined into two main components. Component I (GLOF) is specifically aligned towards reducing GLOF risks arising from Imja Lake, and Component II (Flood) aims to reduce human and material losses from recurrent flooding events in the four flood prone districts of Terai. Approximately 96,562 vulnerable people will directly benefit from this project.	The HydroSOS BaNe project will fully benefit from the efforts of CFGORRP project in Nepal which is strengthening the Glacier Lake Outburst Flooding (GLOF)observation and warning services in pilot districts of Nepal. The output of CFGORRP will be integrated into the HydroSOS EWS and will be utilized by the national agencies together with otherglobal and locally development products for riverine and urban floods.If Glacier Lake Outburst Flooding (GLOF) observation and warning products and services is found effective, it will be expanded to cover also other vulnerable regions of Nepal and Bangladesh.
Integrated River Basin Management (IRBM) in the Hindu Kush Himalayas (HKH) Region/ICIMOD https://www.icimod.org/event/integrated-river-basin-management-in-the-hindu-kush-himalaya/	This initiative is preparing focused basin reports on three river basins – Indus, Ganges, and Brahmaputra – to provide recommendations for elevating river basin governance in the HKH. Also, Training mid-level and senior practitioners across HKH region in IRBM	The HydroSOS BaNe project will benefit of the IRBM-HKH methodologies and tools used for providing recommendations for elevating river basin governance in the HKH and the capacity building activities. Most of the results obtained during IRBM-HKH should be integrated into various activities of HydroSOS BaNe. Indeed, the trained groups of people of IRBM-HKH project will be contacted and involved in the development of the Transboundary HydroSOS EWS and also in the governance related activities leading totailored and sustainable strategies for managing climate change extremes and integrated river basin management for water, energy, food, and ecosystem security. The HydroSOS BaNe project will collaborate with ICIMOD to gain technical expertise in identify the needs and proposing adequate early warning solutions forGLOF, Snow Melt related floods to be possibly included in the future into the HydroSOS EWS system.
Regional Mainstreaming Water Resilience in Asia and Pacific/ADB https://www.adb.org/projects/55064-001/main	Capacity building to enhance water security and resilience in Asia and the Pacific. It seeks to support a) increased climate resilience in water projects, programs, and policies by facilitating a shift toward climate-resilient and low-carbon development; (b) use information and communications technology (ICT), digital and remote sensing technologies, and innovations.	Component 2 of the HydroSOS BaNe project will build on the existing water resources monitoring and flood forecasting capacities and integrate the output of the early warning into HydroSOS EWS. This ADB project provides experiences on the challenges, and lesson learnt during the implementation phase of a climate resilience development and address also the issues of the sustainability of the water security. The proposed project team will have consultation to identify synergies and complementarities between activities. Standard Operating Procedure (SOP) will be developed by the proposed project for the sustainability where it could be helpful for the increased climate resilience in water projects,

		programs, and policies by facilitating a shift toward climate-resilient.
Coastal Resilience through Nature-Based and Integrated Solutions in Asia Pacific (Bangladesh) https://www.adb.org/projects/54212-001/main	Building coastal resilience in Asia-Pacific requires adopting long-term and integrated planning approaches. Given their potential benefits, nature-based solutions are to be considered as part of integrated plans combining grey and green solutions and soft measures such as awareness raising, policy making, land use planning and early warning.	The integrated planning approaches developed through the project favor adaptive management, a risk-based approach, inclusive processes, and consider the full spectrum of coastal resilience in Bangladesh. HydroSOS EWS will ensure the tools and products developed water risk and adaptive management designed and implemented will be assessed and will be integrated in the HydroSOS EWS.
Regional Flood Information System/HKH Hydrological Cycle Observation System (HKH-HYCOS), ICIMOD https://www.icimod.org/initiative/hycos/	It aims at flood management through data sharing from 28 hydro-meteorological stations including the GBM region	Component 2 of the HydroSOS project will build on the existing flood forecasting capacities at ICIMOD and integrate the output of the RFIS into the HydroSOS EWS so that the national foecasters from the meteorological and hydrological services could use it for analyses with other global and hydroSOS products output.
South Asia Water Initiative/World Bank https://www.worldbank.org/en/programs/sawi	SAWI supported climate resilience and sustainable, fair, and inclusive development by: ● strengthening awareness and knowledge about regional water issues; ● enhancing technical and policy capacity; ● supporting dialogue and participatory decision processes to build trust; and	The output of the completed SAWI project in Nepal and Bangladesh such as Strategic Basin Planning, Nepal Water Platform, River Management Improvement Bangladesh, Basin modeling and Strengthening Hydromet Services and DRM in Bangladesh will be reviewed and utilized during the implementation of component 1, 2 and 3. The lesson learned and implementation challenges from the SAWI will not be replicable during the HydroSOS BaNe project.

	• scoping and informing World Bank investments. SAWI worked in the Indus, Ganges and Brahmaputra river basins and in the Sundarbans wetlands, shared by Bangladesh and India. Together, SAWI activities spanned seven countries: Afghanistan, Bangladesh, Bhutan, China, India, Nepal and Pakistan.	World Bank will be invited during the inception phase of the project to technical follow the implementation as well as to ensure the methodologies, tools and products are scaled to cover other region of GBM Basin or South Asia and South–East Countries.
ADB funded Water resources project preparatory Facility/ Expansion of coverage areas for flood control infrastructure, irrigation and drainage areas https://www.adb.org/projects/45206-001/main	A detailed study for high priority water resources projects undertaken; (ii) environmental, social, and technical capacity of the Department of Water Resources and Irrigation (DWRI) improved; (iii) Irrigation Master Plan updated; and (iv) efficient project management.	The ADB funded project is also planning to setup various water resources infrastructures for floods and droughts in the Nepal region. As the HydroSOS BaNe project is not going to implement any structural flood control measures, Component 1 of the HydroSOS BaNe project will develop risk maps and ensure to have details of these water resources infrastructures for improving resilience and capacities of the communities to the climate change events.

STRENGTHENING INTEGRATED FLOOD RISK MANAGEMENT: NEPAL FLOOD RISK SECTOR ASSESSMENT/ADB FUNDED https://www.adb.org/projects/52014-001/main	To strengthen Integrated Flood Risk Management (IFRM) solutions, enhancing knowledge and application of IFRM strategies in DMCs. It will provide and promote holistic IFRM solutions, including basin-scale and nature-based solutions.	The proposed project will build on the work carried out by the ADB funded on IFRM solutions designing as both the project is proposing the IFRM strategies for to maximize net benefits from the use of flood plains and minimizing loss of lives, property damage and impact to environment that may include nature-based and other soft approaches. The HydroSOS BaNe project will assess the technical assistance provided to the participating countries and build on the results to ensure baseline information and solutions designed/proposed are considered during the initial implementation phase especially for component 1 and 2.
IRRIGATION AND WATER RESOURCES MANAGEMENT PROJECT TELEMETRY SYSTEM	Establishment of hydrometric stations equipped with telemetric systems on major rivers, tributaries and key precipitation recording locations for management of water distribution systems on the basis of real time data.	The HydroSOS BaNe EWS project will integrate the real-time data and information from the hydrometric system installed on major rivers, tributaries and other areas for visualization and as well as for hydrological model inputs for developing forecasting and early warning services in the targeted project countries.
DEVCHULI, NAWALPARASI COMMUNITY BASED FLOOD EWS/FUNDED BY PRACTICAL ACTION https://answers.practicalaction.org/our-resources/item/flood-early-warning-system-in-practice-experiences-of-nepal/	It is established in Devchuli, Divyapuri and Pragatinagar of Nawalparasi district for disseminating flood warning information to the communities/ various agencies responsible	The community based flood early warning system developed in the vulnerable areas of Nepal will be checked mainly the methodologies, tools and products developed and how the warning dissemination is supporting the communities receive the timely warning message. If the CBFEWS is effective, the approach could be implemented or extended in other vulnerable areas of Nepal and Bangladesh.

Annex 2: Theory of Change to show linkages between different elements of the HydroSOS BaNe project



Version 1: 09 January 2022

PRE-CONCEPT FOR A REGIONAL PROJECT/PROGRAMME

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme: Hydrological Status and Outlook system for integrated water resources management and climate resilience in Bangladesh and Nepal (HydroSOS-BaNe)

Countries: Bangladesh, Nepal [1]

Thematic Focal Area[2]: Disaster risk reduction and early warning systems

Type of Implementing Entity: Multilateral Implementing Entity

Implementing Entity: World Meteorological Organization

Executing Entities: Bangladesh Meteorological Department (BMD), Bangladesh Water Development Board (BWDB), Department of Hydrology and Meteorology of Nepal

Amount of Financing Requested: 12,090,000 (in U.S Dollars Equivalent)

Project Formulation Grant Request: Yes ☒ No ☐

Amount of Requested financing for PFG: 20,000 (in U.S Dollars Equivalent)

Letters of Endorsement (LOE) signed for all countries: Yes ☒ No ☐

NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities

Stage of Submission:

☒This pre-concept has been submitted before

☐This is the first submission ever of the pre-concept

In case of a resubmission, please indicate the last submission date: N/A

[1] WMO continuously consulted India, Bhutan and People's Republic of China (PRC) for their participation as the executing entities for the proposed HydroSOS project. However, India, Bhutan and PRC have not submitted endorsement and commitment letters. So, the proposed project is submitted only for the two countries: Bangladesh, and Nepal. Once the project is approved and moves into implementation, National agencies of India, Bhutan and PRC will be invited as observers to develop HydroSOS system and after the completion of the project, it is expected that the HydroSOS EWS will be scaled up to cover the entire GBM region possibly through national investments or international funding mechanism

[2] Thematic areas are: Food security; Disaster risk reduction and early warning systems; Transboundary water management; Innovation in adaptation finance.

Project / Programme Background and Context

Bangladesh and Nepal cover a major portion of the Ganga Brahmaputra Meghna (GBM) River Basin. The GBM basin spread over an area of over 1.7 million sq. km and has a population of more than 500 million, making it one of the most populated river basins in the world. Both Bangladesh and Nepal face challenges stemming from its socio-political and ecological context leading to inadequate water resources management. Climate extremes specifically, floods and droughts are common phenomenon with enormous environmental, social and economic consequences. In spite of abundant natural resources, the number of people living under the poverty line and vulnerable to climate change events in these two countries are estimated to be around 10 million. The monsoon flooding during the last five years in the GBM basin, resulted in more than thousand deaths, millions of property damage and severe impact to environment. Around 80% of Bangladesh is floodplain, with major floods affecting millions of people every six years or so. Nepal faces a range of hazards including landslides, debris flow and flash floods and experience an increase in water availability during the monsoon but scarcity during winter and pre-monsoon season impacting its agriculture that is mostly monsoon dependent. Rainfall variation leads to drought, floods, landslides, putting much stress on food distribution. Glacial lakes of Nepal identified as Potentially Dangerous for Outburst causing Floods engendering human lives, adversely impacting agriculture, infrastructure, and reduction in water availability in the downstream areas. Studies conducted for the GBM region suggest that there will be significant variation in flow and quality of water over a medium to long term with strong impact on population, water for public use, demand for irrigation, hydropower, industry etc. The overall trend in the GBM region shows a growing anthropogenic development combined with climatic changes resulting in additional demands on water resources and triggering ecosystem degradation, erosion, salinization, water logging, displacements and migration. Climate change effects are linked to dry season, water shortages and droughts, which is threatening livelihoods, food security and resulting in widespread migration.

The prevailing conditions make it imperative to build adequate capacity, technical knowledge and enable decision making on shared water resources and climate extremes at a regional, national and local levels. Based on recent assessment and participative consultations conducted by the WMO with the National stakeholders of the two countries[2], immediate need for alternating flood and water shortages monitoring and forecasting systems during the monsoon and dry seasons and associated water resources information are highlighted of a growing economy and population. Other main conclusions highlighted were to build upon the current context and on-going projects and initiatives (CR1)~~work~~ to prepare the region for future socio-economic development and environmental changes, such as integration of disaster risk reduction in the national adaptation and management plans (National Adaptation Plans (NAPs) and National Adaptation Programme of Action (NAPA) identified under the National Determined Contribution's (NDC) for the GBM countries.[3] A regional approach will result in greater co-benefits and cost effectiveness as compared to the national one because one set of resources will generate productive outcomes for two countries, which individual national projects would have achieved using more resources (human, time as well as material resources)(CAR1) It thus calls for innovative frameworks and policies, enhancement of synergy, complementarities and coordination at regional level to foster integrated flood and drought management including ecosystem based adaptations, availability of standardized interoperable Hydro-meteorological data, especially on real time basis, coordination of information channels and procedures for end-to-end early warning systems, and increase in knowledge availability with community members on social-economic and environmental risks and their participation in decision making and developing climate change adaptation strategies.

Project / Programme Objectives:

The proposed project objective is to increase the climate adaptive capacities and resilience of beneficiary communities to hydro-climatic risks. Furthermore, the project will develop local, national and regional adaptation strategies and implementation mechanisms based on integrated monitoring and management of water resources. Floods and drought being common feature in the two countries, the project envisages strengthening the capacities of National Meteorological and Hydrological Services (NMHSs) with a regional Hydro-Meteorological early warning system (providing short term and seasonal status) embedded into a long-term integrated water resource information system and concrete adaptation actions developed through a participatory design and executed in an integrated manner(Theory of change, CR2). ~~Existing national hydrological, meteorological and climatological modeling systems, early warning and decision making platforms will be incorporated into the proposed system with a scope to include lessons learned in each geographical context and consider important inputs from other projects and initiatives.~~

[3] https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx

Project / Programme Components and Financing:
The following concrete outcomes are to be further developed in the concept note through additional national dialogues and based on already existing or planned activities.

Project Components	Expected Outcomes	Expected Concrete Outputs	Amount (US$)
Component 1: Risk-based preparedness and adaptation to the climate variabilities and water and environmental uncertainties	Outcome 1.1 Floods and drought risks informed decision-making at the regional, national and local levels	Output 1.1.1 Vulnerability and exposure assessment (including gender and sector-wise analyses) and risk maps are developed for the targeted countries ~~GBM basin~~	1,000,000
		Output 1.1.2 Develop capacity and awareness at the local, national and regional levels to ensure risk informed decision-making	
		Output 1.1.3 Long term risk management strategies identified and integrated into development plans (economic, social, environmental aspects)	
	Outcome 1.2 Preparedness and resilience to climate change promoted through innovative and community-based initiatives.	Output 1.2.1 Implementation of community-based floods and drought management strategies in the vulnerable sites and different ecosystems	2,000,000
		Output 1.2.2 Strengthened awareness of vulnerable communities and agencies on hydro-meteorological risks through education programs including nature-based solutions and mainstreaming gender	
Component 2: Strengthening water resources management through access to hydro-meteorological information and augment regional /national capacity to monitor and assess Hydro-Meteorological hazards	Outcome 2.1 A web-based Hydrological Status and Outlook System for EWS is designed and developed together with the National services	Output 2.1.1 Improved hydrological status and outlook instruments through data standardization for EWS is designed and developed	4,000,000
		Output 2.1.2 Existing products and tools are integrated and visualized in the regional HydroSOS for EWS	
		Output 2.1.3 Establishment of Hydro-Climate Outlook Forums at the regional level	
	Outcome 2.2 Development of medium and long-term concrete adaptation measures in the prioritized areas and updates based on lessons learned and monitoring instruments	Output 2.2.1 EWS and concrete adaptation measures tested in selected vulnerable communities.	2,000,000
		Output 2.2.2 Coordination and collaboration developed at the regional, national and local level	
		Output 2.2.3 Decision-makers are informed with key water resources management parameters for current status and sub-seasonal and seasonal outlooks	
Component 3: Water and climate resilient regional cooperation arrangements together with National and	Outcome 3.1 Improve information base and practices related to water resource management and climate change adaptation	Output 3.1.1 Best practices and experience from other region and river basins are made to ensure that existing national policies and practices are interoperable in GBM river basin cooperation framework	600,000
		Output 3.1.2 Analysis and optimisation of benefits of regional water and climate adaptation action.	

regional stakeholders, and community involvement	Outcome 3.2 National adaptation strategies (i.e. NAPs) are fully inclusive of water management issues, address community concerns. Methodology and mechanism for leveraging and sharing benefits of optimising adaptation at regional level are in place.	Output 3.2.1 An inclusive process is developed to ensure that National adaptation strategies explicitly address water relevant instruments and strategies. Inclusive approaches are operational to include local communities.	600,000
		Output 3.2.2 Regional mechanism for adaptation cooperation on HydroSOS established and operational. Periodic review and update of the mechanism is agreed on by riparian states.	
8. Project/Programme Execution cost			950,000
9. Total Project/Programme Cost			11,150,000
10. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			940,000
Amount of Financing Requested			12,090,000

Project Duration: 4 years (48 months)

PART II: PROJECT / PROGRAMME JUSTIFICATION

There is a need for better, more effective and coherent regional, national and local strategies and decision-making frameworks to address water related climate resilience challenges in the GBM riparian countries. These challenges are being exacerbated by a changing climate, deterioration in socio-economic and environmental conditions and unplanned development. It is thus vital that the GBM basin is better understood through a regional project which provides opportunities to share experiences, and address knowledge gaps. Such a project will be useful to manage water resources, extreme events linked to climatic impact in a transboundary management framework and in an environment of mutual trust and confidence. The cost-effectiveness is assured through the implementation of concrete adaptation activities with community ownership and is the most sustainable means to achieve scalable long-term results at different levels (CAR1). The endeavor is to consolidate gains from various ongoing/past projects from these two countries to link up with adaptation measures pertaining to disaster risks and water resource at a regional scale (CR1). The project partners propose to design and implement a large-scale, concrete and cooperative system allowing integration of relevant knowledge on quantitative and qualitative aspects of water resources and offer services and decision-making support to the end-users. A system-change and capacity development will be carried out through integration of different areas of expertise such as water, climate, weather, agriculture, disaster management etc. and fostering collaboration amongst global, national and local partners which traditionally operate in silos within their own domain (CR2).~~This system (technical development, services delivery, support activities) will be worked out in close cooperation with the national and local partner as well as with the community beneficiaries through stakeholder engagement practices~~. This will improve livelihood support and contribute to increased adaptive capacity and resilience to climate change related events. The development and implementation of a free, open-source, and sustainable Hydrological Status and Outlook System (HydroSOS) will be designed in a consultative manner and aim at augmenting operational capabilities of National Meteorological and Hydrological Services and the institutions in charge of water planning and management and disaster risk reduction. The aim of the HydroSOS-BaNe will be to develop an innovative system operating on a daily, weekly and monthly timescales capable of providing: 1) An indication of the current region-wide hydrological status (including: groundwater, river flow, soil moisture, cryosphere); 2) An appraisal of where this status is significantly different from 'normal' (for example, indicating drought and flood situations); 3) An assessment of where this is likely to get worse over coming months and season. HydroSOS will bring together existing tools and approaches to develop composite products of hydrological and meteorological status and outlook through the implementation of the WMO Hydrohub (enhancing hydrological monitoring and data exchange) and World Hydrological Observing System (WHOS)[4] mandate of standardization of data and information management system. A detailed inventory of existing methodologies, equipment (hard and software), skills and operational procedures in Bangladesh and Nepal will be conducted to build on available tools and products.

The applicability and effectiveness of the proposed HydroSOS-~~-~~BaNe system will be tested in various pilot sites selected by the participating countries to incorporate feedback and suggestions of end-users. Other project

[4] https://public.wmo.int/en/our-mandate/water/whos

outcomes will include development of floods and drought risk maps using the ~~l~~Local, ~~National~~ national and ~~Global~~ global data and impact-based forecasting and warning services. At one level, the risk mapping will enable fill a knowledge gap about the vulnerability, exposure and impacts over various sectors. Futher it will also improve and standardize data gathering and decision-making processes to understand vulnerability accumulation of specific areas and prominent risks for floods and drought events (CR3). Based on recent studies, floods can be predicted successfully with lead-time ranging from several days to even up to a few weeks by some of the countries. However, a regional approach will ensure information is shared between the respective agencies of the countries and is further developed for end-user to support timely decisions. Understanding related to a severe slow-setting drought is constrained due to lack of regional datasets and standardization in analytical methods and interconnectedness between different types of droughts namely meteorological, hydrological and agricultural. The HydroSOS-BaNe project will focus on integration of various types of droughts and provide support in drought monitoring and prediction from monthly to sub-seasonal to seasonal outlooks. It will aim to standardize processes followed across countries in the basin for production of hydrological status and outlooks and ensure region wide collection, dissemination of the information for climate change adaptation measures. The most vulnerable elements of the basin; human and environmental resources such as water, fish, minerals and agriculture etc. need long lasting, innovative, and coordinated measures to ensure sustainable development of the area.

The proposed project will contribute to UN Sustainable Development Goal (SDG) target 6.5 to implement integrated water resources management at all levels, including through transboundary cooperation. It also contributes to target 1.5 in building resilience through reduction in exposure and vulnerability for climate related extreme events; target 2.4 to ensure sustainable food production through climate adaptation to drought, flooding, other disasters; and target 11.5 making human settlements inclusive, safe, resilient and sustainable. At the national level, Water Resources Strategy (WRS) and Intended Nationally Determined Contributions (INDCs) and action plan (National Adaptation Plans or NAP and National Adaptation Plans for Action or NAPA) of each country will be taken into account to ensure that project outcomes are consistent and improves water resources management and in turn, reduce flood and drought disaster risks and impacts. Regional, national and local water management policies and action plans will be reviewed to ensure that knowledge and experience gained through the project components 1 and 2 (CR3) feeds back to the national development policies and plans in the area of livelihood, natural resources management, ecosystem protection, disaster risk management, climate change adaptation and human rights in relation to migration and adaptation. A specific guideline for regional entities or centers will be prepared together with the involvement of the national stakeholders with an aim to build better coordination and collaboration between different competent agencies.

Regional and National level capacity building activities both in terms of development and use of a sustainable, improved, tailored and affordable HydroSOS-Ban-Ne system will be given due importance for an integrated flood/drought/ and water resources management (CR2). Simultaneously nature-based solution will be promoted to build long-term collaboration, sustainability and adoption for various eco-friendly solutions[5]. Gender mainstreaming will form an important element of the project's outlook and it will be given adequate importance at the planning, policy and development of measures for managing climate extreme events. ~~A meaningful partnership with stakeholders is crucial for identifying needs and priorities as well as for developing sustainable, improved, tailored and affordable means for integrated flood/drought/ and water resources management.~~ A preliminary joint national assessment and consultation studies[6] were conducted in the targeted countries with the NMHSs and other concerned authorities during the year 2020 with an aim to better understand their current capabilities, needs and priorities for effective management of water resources and climate extremes in the GBM countries. Even though there were travel restrictions in these countries due to the covid-19 pandemic, the project team organized vulnerable community visits (with local level associations, women, youths, minor and vulnerable groups, at various sites of the basin to understand current needs and examine benefits of the project outputs and services), regional virtual consultation meeting, two day hybrid workshop and national consultation workshops with the National stakeholders to present and finalize the project activities and collect missing and additional information such as user requirements to investigate and discuss benefits and functionalities (types of information, forms of warning etc.), selection and finalization of the sites for the pilot testing of the HydroSOS-BaNe products, inputs on social and environmental risks, role and responsibilities of the national agencies, etc. During the next phase of the project development, several face-to-face consultations are planned with the national and regional entities ~~including conducting of social and environmental impact assessments~~ including the representatives and focal point of other projects and beneficiaries' communities to determine the good practices, lessons learned, and possible gaps (CR1) .

[5] pdf-2021-9843-3-Nature-based Solutions in the GBM river basin.pdf (worldwaterweek.org)

[6] https://wmoomm.sharepoint.com/:f:/s/Services/Er5M0Eve5KhCumNhufB00y0BKx_EEDIL6f7PmNVDRZ1fvQ?e=sIIGGK (not published)

The project will indirectly benefit hundreds of thousands of people living in the GBM countries through the proposed strategy of community-based flood and drought management and by enabling innovative local level climate change adaptation measures such as raising the level of houses, building of temporary structural measures, changing the agriculture/horticulture cropping patterns etc (CR3). In addition, private sectors such as those in agriculture, aquaculture, hydropower will be one of the important stakeholders and benefit from the project outcomes. The studies for hazard and vulnerability mapping proposed under Component 1 of this project will help screen potential risks from a local community perspective (as per the Adaptation Fund's Environmental and Social Policy (ESP) and Gender Policy (GP)) that may arise during implementation. From an environmental viewpoint, the IUCN Red List of Ecosystems Categories and Criteria will be studied to better understand the status of ecosystems, applicable at local, national and global levels. A balanced ecosystem services will be promoted through nature-based solutions linking ecosystem management with livelihoods. With the information available at this stage, the project is expected to fall into medium risk category B because interventions such as information through risk maps and EWS could lead to movement of communities to a safer zone where they might need to identify new resources for survival.

The project will ensure that its products and tools build on existing resources, infrastructures and services available at the national and local level and thus avoid duplication. Some of the existing National level activities (Hydro-Meteo monitoring, forecasting and warning services by the National Meteorological and Hydrological services of the targeted countries) will be considered and data and outputs will be integrated into the proposed HydroSOS system. Synergies and complementarities will be established with completed and on-going regional and national projects such as GEF-funded national and regional projects (CR1), WMO HYCOS-HKH, Regional flood outlook for the Ganges and Brahmaputra River basins developed by ICIMOD, South Asia Flash Flood Guidance System (SAFFGS), IUCN BRIDGE GBM etc. A preliminary list of national activities and projects are mentioned under Annex 2. ~~The proposed HydroSOS-BaNe project will design and develop products and tools in a consultative manner so as to cater to the needs of practitioners, policymakers and other users.~~ A repository of technical reports, voices from the fields, training manuals and guidelines will be developed and made accessible to all. Innovative knowledge products and skills developed through the project will be communicated to respective stakeholders of the targeted countries, across the South-Asian countries and beyond. The medium of communicating these outputs will be the project website, social media channels, national and international workshops/seminars etc. Several experience sharing field visits with the neighboring countries will be organized for the National and local level stakeholders.

The provision of sufficient human and financial resources is an essential requirement for the sustainability of the new knowledge products and tools. Knowledge management tools and platform will be developed for sharing experience and storing project documents, reports etc. Long term maintenance of the tools and methodologies has been secured through a letter of commitment from the participating countries, possibly one of the national entities or the Joint River commission formed for Bangladesh and Nepal will become in charge of supporting regional coordination and operation of the developed HydroSOS-BaNe products and services for the targeted countries. It will also be ensured that the methodologies adopted, and human resources trained (from both the agencies and communities) remain a support for other actors and stakeholders in developing floods and drought risks maps, climate change scenarios, community-based initiatives and HydroSOS of their respective countries (and also in regions within and outside of the GBM basin) through national investments or international funding mechanism.

PART III: IMPLEMENTATION ARRANGEMENTS

WMO will be the implementing entity for the project providing overall management and specific technical support in the execution of the activities. Its international experience and presence through their WMO Regional Office for Asia, situates it ideally for coordinating with national authorities, especially NMHSs. The Technical Support Unit (TSU) of the Associated Programme on Flood Management (APFM) and the Integrated Drought Management Programme (IDMP) supported by a network of Support Base Partners comprising of NMHSs research centers, private engineering companies and internationals organizations will design and develop technical solutions with the executing partners and they will have close links with the beneficiaries in the field. Other WMO teams (members of Standing Committee on Hydrology, Disaster Risk reduction and Agriculture) will provide support in reviewing the project results and programmes. The HydroSOS-BaNe team comprising of WMO hydrological coordination staff, UK Centre for Ecology & Hydrology(UK-CEH) and other contributing partners will be instrumental in providing technical guidance and implementation support to the national agencies. Other on-going initiatives of WMO especially the Global Framework for Climate Services (GFCS), Climate Risk and Early warning system (CREWS), Flash Flood Guidance System, HydroHub programme, Dynamic Water Assessment Tool (DWAT) will contribute to the development of tools, products

and services delivery to the decision makers and also expand the results of the project to the neighboring regions.

At the National level, WMO will collaborate with NMHSs of the two targeted countries to lead the technical implementation and coordination of the project activities. For executing the project activities, the NMHSs of each country (through a project technical manager) will be the National focal point and will implement the activities at the National and local levels through local agencies, NGOs and private partners forming a network of technical support group. NMHSs will be in-charge of engaging and disseminating the project results towards the related Ministries in charge of Water Resources, Environment, Hydropower, Irrigation, Agriculture and Civil Defense, and to the regional organizations such as International Centre for Integrated Mountain Development (ICIMOD), Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) etc. working at the basin level. The National agencies will come up with regional intergovernmental associations or authorities (panel of meteorologists, hydrologists, and disaster risk management professionals from the operational organizations or services) to define the regional implementation plan and strategies for the long-term sustainability of the project outputs and outcomes. A project steering/advisory committee will be established with membership of National designated authority, agencies specialized in hydrology, meteorology, water resources, disaster management and of regional entities including representatives from major ongoing and planned projects to share exchange of experience, tools and methodologies (CR1). During the next phase of the project development, a detailed project implementation arrangement will be described with a clear description of the roles and responsibilities (organization chart showing how they report to each other) of the implementing entity and of executing entity or organizations/stakeholders involved in the project.

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

A. Record of endorsement on behalf of the government[7]

Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project/programme. Add more lines as necessary. The endorsement letters should be attached as annexes to the project/programme proposal.

Ms. Farhina Ahmed Secretary Ministry of Environment, Forest and Climate Change	Date*: August 14 2022*
Mr. Yam Nath Pokharel Under Secretary (Technical) Climate Change Management Division Ministry of Forests and Environment	Date*: January 09 2023*

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.
Moyenda Chaponda Implementing Entity Coordinator ~~Office for Resource Mobilization and Development Partnerships~~Project Management and Implementation Unit, WMO

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

সচিব
পরিবেশ, বন ও জলবায়ু পরিবর্তন মন্ত্রণালয়
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
বাংলাদেশ সচিবালয়, ঢাকা-১০০০

Secretary
Ministry of Environment, Forest and Climate Change
Govt. of the People's Republic of Bangladesh
Bangladesh Secretariat, Dhaka-1000

Letter of Endorsement on behalf of the Government of Bangladesh

Record No- 22.00.0000.078.99.011.17- 25 Date: 14 August 2022

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Hydrological Status and Outlook system for integrated water resources management and climate resilience in the Ganga Brahmaputra Meghna Basin (HydroSOS-GBM)

In my capacity as designated authority for the Adaptation Fund in Bangladesh, I confirm that the above regional grant proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Bangladesh.

Accordingly, I am pleased to endorse the above grant proposal with support from the Adaptation Fund. If approved, the project will be implemented by the World Meteorological Organization (WMO) and executed by the Bangladesh Meteorological Department (BMD), Bangladesh Water Development Board (BWDB), National Center for Hydrology and Meteorology (NCHM)-Bhutan, Central Water Commission (CWC) and India Meteorological Department (IMD), Department of Hydrology and Meteorology of Nepal).

Sincerely,

14.08.2022

Dr. Farhina Ahmed
Secretary
Ministry of Environment, Forest and Climate Change
and
Designated authority for the Adaptation Fund in Bangladesh

Government of Nepal

Ministry of Forests and Environment

(Climate Change Management Division)

Ref.No. 10

P.O.Box No.3987
Singha Durbar, Kathmandu

Date:- July 31, 2022

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement of the pre-concept note "Hydrological status and outlook system for integrated water resources management and climate resilience in the Ganga Brahmaputra Meghna Basin (HydroSOS-GBM)".

In my capacity as designated authority for the Adaptation Fund, I confirm that the above mentioned pre-concept note is in accordance with the Government of Nepal's national and regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Nepal.

Accordingly, I am pleased to endorse the pre-concept note with support from the Adaptation Fund-Regional Projects (2+ countries, USD 14 million). If approved, the project will be implemented by the World Meteorological Organization (WMO) and executed by the relevant National Meteorological and Hydrological Services in Bangladesh, Bhutan, India, and Nepal in close coordination with the climate change focal ministry in these countries.

Thank you very much for your support and cooperation.

Best regards

Arun Prakash Bhatta (PhD)
Designated Authority, Adaptation Fund
Climate Change Management Division
Ministry of Forests and Environment
Singhadurbar, Kathmandu, NEPAL.

TeL: +977 1 4211567
Web: https://www.mofe.gov.np/

Project Formulation Grant (PFG)

Submission Date: 09 January 2023

Adaptation Fund Project ID:
Country/ies: Bangladesh and Nepal
Title of Project/Programme: Hydrological Status and Outlook system for integrated water resources management and climate resilience in Bangladesh and Nepal (HydroSOS-BaNe)
Type of IE (NIE/MIE): MIE
Implementing Entity: World Meteorological Organization
Executing Entity/ies: National Meteorological and Hydrological Services of the targeted two countries (Bangladesh Meteorological Department (BMD), Bangladesh Water Development Board (BWDB), and Department of Hydrology and Meteorology (DHM) of Nepal)

A. Project Preparation Timeframe

Start date of PFG	**27 March 2023**
Completion date of PFG	**06 August 2023**

B. Proposed Project Preparation Activities ($)

Describe the PFG activities and justifications:

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount
Hire a consultant to contribute to the development of the concept note by: · Performing a need assessment and developing operational solutions proposal for the HydroSOS pilot sites . Identify country specific activities needed for developing HydroSOS system	Obtain full description of problems to be solved, available data and historical events, define needs and priorities and propose operational activities needed for developing HydroSOS system	5,000
Organizing and participating to the regional Workshop organized by WMO and National Meteorological and Hydrological Services (NMHSs) to define tasks distribution and pilot areas	Meet the national and regional partners and stakeholders to validate the draft concept note and discuss detailed implementation arrangements, pilot testing areas, and finalize the above	15,000
Total Project Formulation Grant		20,000

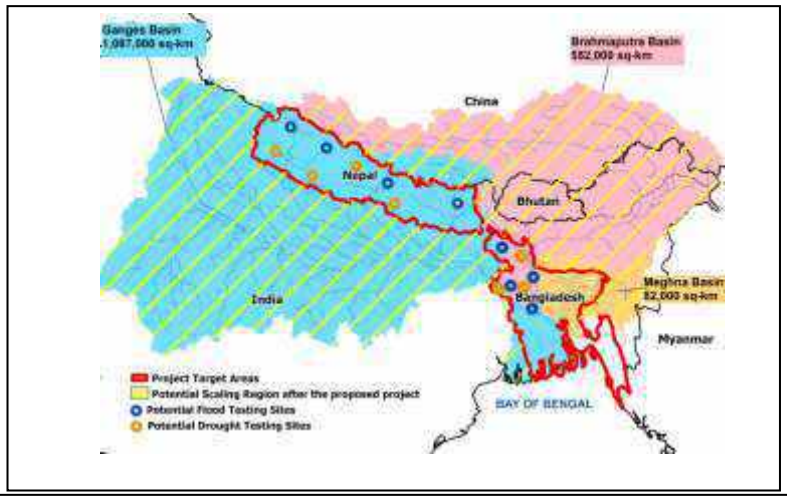
C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Moyenda Chaponda, Project Officer, World Meteorological Organization		January 09 2023	Dr Hwirin Kim	+41 22 730 8358	hkim@wmo.int

Date: January 09 2023	Tel. and email: +41 22 730 8646 and mchaponda@wmo.int
Project Contact Person: Dr Hwirin Kim	
Tel. And Email: +41 22 730 8358 and hkim@wmo.int	

Annex 1: The targeted project region (area covered under the red boundary) with the potential pilot testing sites of the HydroSOS system and community-based initiatives. The test sites will be finalized in the next phase of the project preparation phase:



Available Hydrological and Meteorological stations or associated existing products in Bangladesh and Nepal to be used for developing the HydroSOS system

HydroSOS Global demonstrator products as a demonstration of end products:
https://eip.ceh.ac.uk/hydrology/HydroSOS/portal/

Annex 2:

2.1 Some of the important reference materials consulted:

1) WMO National consultation and assessment reports of Bangladesh, Bhutan, India and Nepal. 2019-2020 (Unpublished)
2) Priya, Satya, William Young, Thomas Hopson, and Ankit Avasthi. 2017. Flood Risk Assessment and Forecasting for the Ganges Brahmaputra-Meghna River Basins. Washington, DC: World Bank.
3) Mélanie Becker et al. 2020. Water level changes, subsidence, and sea level rise in the Ganges–Brahmaputra -Meghna delta, Proceedings of the National Academy of Sciences Jan, 117 (4) 1867-1876;
4) P F Uhe et al, 2019, Enhanced flood risk with 1.5°C global warming in the Ganges–Brahmaputra–Meghna basin
5) University of Southampton, 2017, The Ganges Brahmaputra Meghna Delta: Understanding the Present State of Climate Change, Adaptation and Migration, (DECCMA) project (IDRC 107642) under the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) programme
6) FAO, 2011, Transboundary River Basin Overview – Ganges-Brahmaputra-Meghna
7) Masood M et al, 2015, Persistence Characteristics of Floods and Droughts of the Ganges- Brahmaputra-Meghna Basins Using Flood Duration Curve and Drought Duration Curve
8) Robert J Nicholls et al, 2020, Deltas in the Anthropocene- Ganges-Brahmaputra-Meghna Delta, Bangladesh and India: A Transnational Mega-Delta
9) Singh and Kumar, 2018, Climate change impacts on Hydrology and Water Resources of Indian River Basins. Current World Environment, Vol. 13(1): 32-43.
10) BMCI, 2016, Bhutan Climate + Change Handbook, Bhutan Media and Communication Institute.
11) Whitehead et al., 2015. Impacts of climate change and socio-economic scenarios on flow and water quality of the Ganges, Brahmaputra and Meghna (GBM) river systems: low flow and flood statistics. Environmental Science Processes and Impacts, Vol. 17: 1057-69.
12) Bharati et al., 2014. The Projected Impact of Climate Change on Water Availability and Development in the Koshi Basin, Nepal. Mountain Research and Development, Vol. 34(2): 118-130.

2.2 List of projects/initiatives to be screened during the next phase of project development for developing synergies or complementarities

1) GEF funded projects in Bangladesh and Nepal
    - GEFID 10207 Building climate resilient livelihoods in vulnerable landscapes in Bangladesh (BCRL)
    - GEFID 10727 Managing Watersheds for Enhanced Resilience of Communities to Climate Change in Nepal (MaWRiN)
    - GEFID 6989 Developing Climate Resilient Livelihoods in the Vulnerable Watershed in Nepal
    - GEFID 4551 Community Based Flood and Glacial Lake Outburst Risk Reduction

~~1)~~2) RMSI Private Ltd., India, developed a calibrated flood risk assessment for the Ganges River basin and created an online flood risk atlas under the leadership of the World Bank team.

~~2)~~3) NCAR provides operational river forecasts for 87 locations across the Ganges-Brahmaputra-Meghna basins. The red dots show the forecasting sites (which coincide with river-gauge sites). The flood forecasts are available online: http://indiawbg.rap.ucar.edu/display/

~~3)~~4) Building River Dialogue and Governance for civil society organizations in the Ganges-Brahmaputra-Meghna river basins (BRIDGE GBM) https://www.iucn.org/regions/asia/our-work/regional-projects/bridge-ganges-brahmaputra-meghna-river-basins-bridge-gbm

~~4)~~5) South Asia Flash Flood Guidance System (SAFFGS)

~~5)~~6) Regional flood outlook for the Ganges and Brahmaputra river basins developed by ICIMOD https://lib.icimod.org/record/34366

6) South Asia Water Initiative (SAWI) - https://www.worldbank.org/en/programs/sawi.

7) South Asia hydromet forum - https://thedocs.worldbank.org/en/doc/659031589812163011-0310022020/original/SAHFIIfinalreport.pdf

8) Climate Adaptation and Resilience for South Asia (CARE) project - https://projects.worldbank.org/en/projects-operations/project-detail/P171054

9) Reducing Climate Change-induced Risks and Vulnerabilities from Glacial Lake Outbursts in the Punakha-Wangdi and Chamkhar Valleys https://www.thegef.org/project/reducing-climate-change-induced-risks-and-vulnerabilities-glacial-lake-outbursts-punakha

10) EU-SAR DRM program - https://www.gfdrr.org/sites/default/files/publication/program-profile-eu-south-asia-capacity-building.pdf

11) Regional Flood Information System in the Hindu Kush Himalayan Region under Hindu Kush Himalayan-HYCOS (HKH-HYCOS) project https://www.icimod.org/initiative/hycos/

12) WMO Hydrological Observing System (WHOS) https://public.wmo.int/en/our-mandate/water/whos

Field Code Changed