ADAPTATION FUND

# PROPOSAL COVER PAGE

1. Type of project: Single-Country ☐ Regional ☒
2. Countries: Costa Rica, Panama
3. Project/Programme Category: Regular
4. Project/Programme Stage: Pre-concept
5. Requested financing amount (in U.S. Dollars Equivalent): 13,932,655
6. Project Formulation Grant (PFG) Request: Yes ☒ No ☐
7. Requested financing amount for PFG (in U.S. Dollars Equivalent): 20,000
8. Letter/s of Endorsement (LOE) signed:
   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

   Yes ☒ No ☐
9. Write the date of endorsement for each LOE for the project.

   a) Country: Costa Rica Date signed: 07/06/2024
   b) Country: Panama Date signed: 21/05/2024
10. Title of Project/Programme: Adapting national and regional Water Resources Management to climate extremes through Hy-dro-climatic Information, Early Warning Systems and Decision Support Tools (working title)
11. Implementing Entity: World Meteorological Organization (WMO)
12. Executing Entities: Costa Rica's National Institute of Meteorology (IMN), Costa Rican Institute for Electricity (ICE), Panama's National Institute of Meteorology and Hy-drology (IMHPA); Global Water Partnership (GWP), Regional Committee for Water Resources (CRRH
13. Is this a new submission or a resubmission: New: ☒ Resubmission: ☐
14. If a resubmission, please select the last submission date: n/a

# PRE-CONCEPT FOR A REGIONAL PROJECT/PROGRAMME

## PART I: PROJECT/PROGRAMME INFORMATION

**Title of Project/Programme:** Adapting national and regional Water Resources Management to climate extremes through Hydro-climatic Information, Early Warning Systems and Decision Support Tools (working title)

| | |
|---|---|
| **Countries:** | Costa Rica, Panama, Central America |
| **Thematic Focal Area[1]:** | Disaster risk reduction and early warning systems |
| **Type of Implementing Entity:** | Multilateral Implementing Entity |
| **Implementing Entity:** | WMO |
| **Executing Entities:** | Costa Rica's National Institute of Meteorology (IMN), Costa Rican Institute for Electricity (ICE), Panama's National Institute of Meteorology and Hydrology (IMHPA); Global Water Partnership (GWP), Regional Committee for Water Resources (CRRH) |
| **Amount of Financing Requested:** | 13,932,655 (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* **tage 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: Click or tap to enter a date.

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

## Project/Programme Background and Context:

Central America (CA) is considered one of the most vulnerable regions to climate change. The countries in the region are consistently ranked highest in the world by risk of being impacted by extreme events (high confidence). Hydro-meteorological events, are the most frequent extreme events and have the highest impact (high confidence) [2].

Among such events are the increasing frequency and severity of droughts, with a concomitant decrease in water supply, impacting agricultural production, traditional fishing, food security and human health (high confidence). In CA, 10.5 million people live in the so-called Dry Corridor, a region with an extended dry season and now more erratic rainfall patterns[2]. The increasing water scarcity is and will continue to impact food security, human health and well-being[2]. On the other side, the impacts of floods mainly affect the urban poor neighbourhoods and are responsible for the majority of disaster-related deaths. Climatic drivers, such as tropical storms, hurricanes, and heavy rains leading to floods, interact with social, political, geopolitical, and economic drivers (high confidence)[2].

According to the World Bank, Costa Rica (CR) has almost 7% of its area exposed to three or more hazards which translates to the 8th highest economic risk exposure in the world. According to Panama's (PA) third National Communication on Climate Change, the country ranks fourteenth among the countries with the highest exposure to multiple hazards, with 15% of its area and 12% of its total population exposed to two or more hazards. The exposure to multiple hazards, such as floods and droughts, becomes more relevant for the three transboundary basins shared by CR and PA: Changuinola, Sixaola and Chiriqui. Recent events, such as droughts in 2018-2019, Hurricanes Eta and Iota in 2020, and floods in 2022, have highlighted the precarious position of CA countries, particularly CR and PA.

In this context, it becomes much more important and prioritary to have accurate and timely hydro-meteorological information that facilitates and allows better decision making related to the protection of the population and their property. For additional context please see Annex 1.

With the support of the World Meteorological Organization (WMO) and the Inter-American Development Bank (IDB) and in close collaboration with the National Meteorological and Hydrological Services (NMHSs) and sectoral information users, a detailed national assessment of hydrometeorological value chain was carried out in both countries. This exercise resulted in strategic roadmaps to improving the provision of hydrological services at the national level. The needs identified are numerous and ambitious, but in particular a lack or insufficient national-scale hydrometeorological data production coverage and integrated databases, localized and operational early warning systems, and limited institutional monitoring, planning and governance, particularly in relation to droughts and floods, as well as a lack of stakeholder awareness.

Having these valuable planning instruments, together with the recently created Institute of Meteorology and Hydrology (IMHPA) of PA and two consolidated and recognized institutions in CA (Instituto Meteorológico Nacional (IMN) and the Instituto Costarricense de Electricidad (ICE)) as well as the recent change of government administrations in both countries, opens a window of opportunity for the joint development and implementation of capacity building initiatives to strengthen the provision of services particularly linked to droughts and floods. The existence and willingness of the Comité Regional de Recursos Hidráulicos (CRRH) of the Sistema de Integración Centroamericana (SICA) to support and facilitate not only the implementation, but also to contribute to the integration and extension of national benefits and results to the regional level throughout CA represents an additional added value. In addition, WMO and its partners, such as Global Water Partnership (GWP), will also provide added value through the different technical products and results of their associated programs for drought and flood management.

Thus, the implementation of this initiative from an integrated point of view at the national, binational and regional levels will not only strengthen regional and binational institutional arrangements and tools, but will also favor the availability, access and provision of accurate and timely services, information and data according to the general needs of the population and particular needs of end users in priority communities, specifically related to drought and flood management. This integrated and effective approach will also contribute financially by achieving economies of scale in joint implementation, as well as addressing limited institutional budgets and bureaucratic processes at the national level.

[2] https://www.ipcc.ch/report/ar6/wg2/chapter/chapter-12/

## Project/Programme Objectives:

The project objective is to enhance climate adaptative capacity and resilience to droughts and floods in CA with focus on CR and PA through the enhancement of 4 pillars of Early warning Systems[3], as well as mainstreaming into their institutional, national and regional policies. This will be achieved by: (1) Strengthen capacities for observing, monitoring and forecasting meteorological, hydrological, and climate related hazards through the improvement of observing and data systems to allow data collection, interoperability, exchange and integration, and informed decisions at a regional and national level; (2) Develop and implement a (virtual) CA Flood and Drought Management Center (CAFDMC) to strengthen regional coordination for flood and drought management, and enhancing risk knowledge and multi-hazards early warning capacities at a regional, national and local scale, targeting the vulnerable through pilot projects, and ensuring that the National Droughts and Flood Plans are developed and established; (3) Enhance institutional capacity and stakeholders awareness to enable integrated drought and flood management at a regional, national and local level enabling CRRH, CR and PA to produce important fit-for-purpose information that helps regional, national and local decision-making processes and improving institutional structures, assuring improved inclusive policy tools for flood and drought management systems in a gender and socially-inclusive manner.

## Project/Programme Components and Financing:

The draft project components, outcomes and outputs are proposed as follows (to be further refined at the concept note stage and further described in Annex 2):

| Components | Expected Outcomes | Expected Outputs | Countries | Amount (US$) |
|---|---|---|---|---|
| 1. Infrastructure, institutional set-up and processes for risk knowledge and Early Warning | 1.1 Enhanced and sustained mechanisms for flood and drought risk knowledge | 1.1.1 Flood and drought risk assessment mechanism agreed and established, baseline risk assessment for priority basins defined | CR & PA | 770,000 |
| | | 1.1.2 Flood and drought impact assessment and monitoring methodology developed and agreed, regional impact data base established | CR & PA | |
| | | 1.1.3 Socioeconomic benefit (SEB) analysis performed to showcase the benefit of hydrometeorological information | CR, PA & CA | |
| | 1.2 Enhanced and sustained hydrometeorological monitoring and forecasting | 1.2.1 Duly designed and modernized (and/or instrumented) hydromet monitoring networks in priority basins integrated at both national and regional level, operating continuously and sustainably based on solid financing strategy | CR, PA & CA | 5,991,000 |
| | | 1.2.2 Hydromet and climate database management systems developed and implemented at the national (including national QA/QC systems) and regional level (NMHSs) | CR, PA & CA | |
| | | 1.2.3 Structures established to integrate, process and disseminate data at national and regional level according to end-user requirements and necessities at a public and sectoral levels | CR, PA & CA | |
| | | 1.2.4 Products and services defined and developed in a participative manner with communities and end-users both at a basin scale (for floods) and at a national/basin scale (for droughts) | CR & PA | |
| | | 1.2.5 Hydrological status and outlook products (sub-seasonal to seasonal) for priority basins generated according to international guidelines and end-users needs at sectoral levels | CR & PA | |
| | 1.3 Enhanced dissemination of warnings for flood and drought | 1.3.1 Structures for Communication and dissemination of warnings established and implemented with focus on last mile and connected to local and national flood contingency plans and drought plans | CR, PA & CA | 1,000,000 |
| 2. Flood and drought management and risk mitigation enhancement | 2.1 Strengthened regional coordination of flood and drought management and policy | 2.1.1 CAFDMC established with the support of NMHSs, managing and providing harmonized risk knowledge, data and information as well as build national capacity | CR, PA & CA | 650,000 |
| | | 2.1.2 Regional institutional arrangements and working groups established under the umbrella of the CAFDMC | CR, PA & CA | |

[3] risk knowledge, monitoring, dissemination, and preparedness/response capacity

| | | | | |
|---|---|---|---|---|
| from regional to local | 2.2 National planning for flood and drought established and response capacity strengthened | 2.2.1 National drought plans established and/or support for their implementation that integrate all relevant sectors with a society-wide approach. | CR & PA | 480,000 |
| | | 2.2.2 National flood plans established integrating relevant sectors with a whole-of-society-approach | CR & PA | |
| | | 2.2.3 Decision-support system implemented at a national level for integrated water management | CR & PA | |
| | 2.3 Vulnerable communities more resilient against flood and drought | 2.3.1 Community-level climate-resilient drought risk management plans developed for vulnerable communities | CR & PA | 1,200,000 |
| | | 2.3.2 Community flood managements plans incl. contingency planning established in vulnerable communities of priority basins | CR & PA | |
| | | 2.3.3 Pilot projects in prioritized basins to reduce drought and flood risk in vulnerable communities implemented, prioritizing Nature-based Solutions | CR & PA | |
| 3. Enabling environment for flood and drought resilience building | 3.1 Enhanced institutional capacity, stakeholders awareness and gender mainstreaming for integrated drought and flood management | 3.1.1 Framework for sustainability of hydrometerological services embedded in National legal and planning instruments, including ministerial decrees. | CR, PA & CA | 1,480,000 |
| | | 3.1.2 Policy and governance mechanisms and instruments in place for strengthening capacity and institutional coordination at all stages of hydromet, including a financial sustainability strategy/plan | CR, PA & CA | |
| | | 3.1.3 Gender action plans, indicators and trainings are developed and implemented at the institutional level | CR & PA | |
| | | 3.1.4 Comprehensive training and education program developed and implemented for all stakeholders at regional, national and local level. | CR, PA & CA | |
| | | 3.1.5 Knowledge management and Community of Practice on climate-resilient flood and drought management | CR, PA & CA | |
| 4. Project/Programme Execution cost | | | | 1,095,050 |
| 5. Total Project/Programme Cost | | | | 12,666,050 |
| 6. Project/Programme Cycle Management Fee charged by the Implementing Entity | | | | 1,266,605 |
| **Amount of Financing Requested** | | | | 13,932,655 |

**Project Duration:**
Five (5) years / (60 months)

## PART II: PROJECT/PROGRAMME JUSTIFICATION

**Project Structure.** This project is structured in relation to the main barriers found in the roadmaps: (1) insufficient hydromet coverage and data collection including the need for data exchange and adequate scale for effective hydromet services delivery; (2) limited governance and lack of enabling environment for institutional effectiveness, including multi-sectoral coordination, and data & information sharing; (3) limited governmental financing and budgets; (4) insufficient hydroclimatic information to plan, develop and manage water sustainably, droughts and floods, and early warning; and (5) insufficient institutional support for regional hydromet operations due to weaknesses and lack of regional tools, methodologies, and products.

**Why the project is needed.** The project directly addresses part of the countries' roadmaps for enhancing hydrometeorological services (see Annex 3 for more information about these roadmaps). In a national and regional context, where countries are increasingly more vulnerable and exposed to the impacts of climate change and extreme events such as droughts and floods, it is prioritary and essential to build capacities that allow the protection of their population and their property. This means timely and accurate information (early warning) for decision making and planning. Without this information, decision-making will remain

reactive, and adaptation measures will be less effective and late, resulting in greater impacts and raising vulnerability, with increasingly higher recovery costs[4,5].

This implies working at different levels: from the institutional level, improving and strengthening planning, financing, coordination and dissemination schemes and mechanisms, as well as training and education; to the technical field, through the development of methodologies, processes, protocols and systems that facilitate data collection, generation of products and delivery of information and services in accordance with the needs of end users.

**Beneficiaries, gender, and social inclusion and stakeholder engagement**. The project will have beneficiaries at different levels: at the regional level, CRRH and the SNMH's of CA (some actions/outputs may be extensive to regional users and to other SNMHs both immediately and eventually through adjustment and/or adaptation; i.e. methodologies, data, systems, training and education, coordination, governance and policy instruments, etc.); at the national level, general population, institutional and sectoral users; and at the local level, in priority vulnerable communities, the general population and end users.

Gender and social inclusion will be addressed through the development of specific action plans, including monitoring indicators and training programmes. The stakeholders engagement is also foreseen at different levels: (i) products and services defined and developed in a participatory manner with communities and end users; (ii) regional institutional arrangements and working groups established under the umbrella of the Regional Flood and Drought Management Center; and (iii) participatory planning with vulnerable communities for developing management and contingency plans and pilot projects in priority basins.

**Contribution to sustainable development.** Hydromet data and information is used for decision making and planning processes across many sectors and therefore it supports sustainable development. This project will provide information to enhance water resources management in support of water dependent sectors (drinking water supply and sanitation, agriculture and food systems, energy, mining, transportation, forestry and ecosystems), as well as to reduce disaster risk particularly related to droughts and floods. Furthermore, it also contributes to specific goals and objectives of national planning instruments such as the Drinking Water Investment Plan (2019-2025), the National Risk Management Plan (2021 - 2025), the National Adaptation Plan (PNA 2022 - 2026), National Determined Contribution (NDC 2020) and the National Integrated Water Resources Management Plan (PNGIRH), in the case of CR; and the National Water Security Plan, IWRM Action Plan and the NDC 2020 in the case of PA.

**Main expected outputs of the project**. Methodologies and mechanisms to evaluate drought and flood risk and impact implemented at the institutional and regional level, including risk baselines and impact databases. Modernized hydromet monitoring networks in priority basins integrated at both national and regional level, operating continuously and feeding stakeholders accessible databases and sustainably based on solid financing strategy and climate products (including outlooks) and services related to droughts and floods defined in a community participative manner, as well as proper communications of warnings connected to national, regional and local droughts and flood plans. These elements directly contribute to: increased the competitiveness and economic development of the countries and the region; reduction of vulnerability to climate change; institutional strengthening of meteorological, hydrological, water, and disaster risk management authorities; development and social well-being of the vulnerable to climate change; and improved management of water resources and natural disasters at the national level caused by hydrometeorological phenomena exacerbated by climate change.

**Innovation and cost effectiveness.** The creation and operation of a virtual CAFDMC is an innovative approach given that the countries do not currently share a common platform nor a national level monitoring practices and protocols, nor they link such practices to the planning and operations of the institutions that manage hydrometeorological related disaster risk. Connecting the products and services of the CAFDMC with the national and communities-based droughts and floods management plans will harmonize risk knowledge, data and information as well as build national capacity. Innovative approaches to capacity development will also be sought, especially in consideration of WMO Regional Training Centres (RTCs).

[4] Drought affecting the Panama Canal operations reducing significantly the national income and thus the GDP. https://www.bbc.com/news/business-68467529

[5] Costa Rica reduces energy production due to drought. https://phys.org/news/2024-05-costa-rica-ration-electricity-drought.html

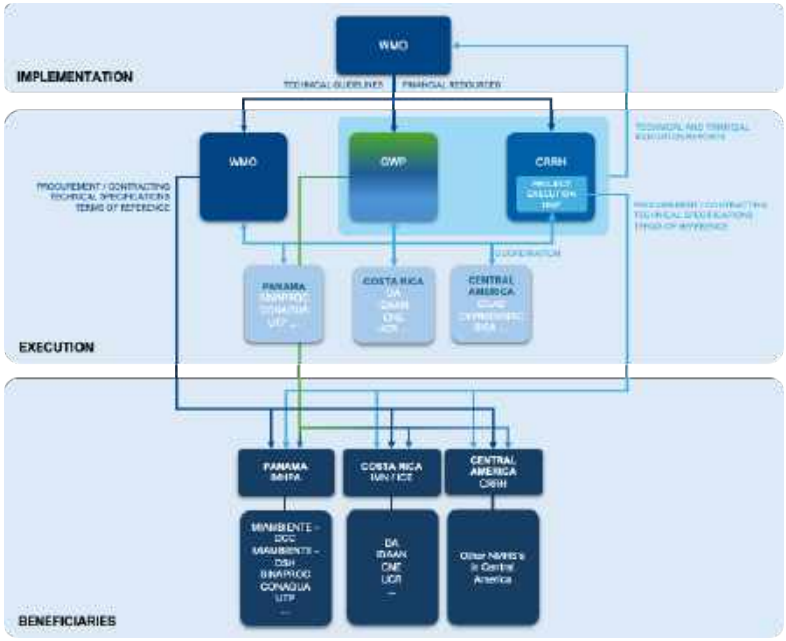
The project will also provide socioeconomical analysis as well as to identifying the most reliable mechanisms (e.g. framework for sustainability embedded in legal and planning instruments) to ensure political commitment and matching public funding for the provision of hydrometeorological and water resources information to support decision-making under a changing climate. Besides the policy and governance mechanisms to strengthen coordination among institutions, gender action plans and comprehensive training and education in complement to knowledge management and communication are also relevant outputs.

**Sustainability and Scalability.** Elements that contribute to the sustainability of the project include not only the integrated approach to implementation in geographic terms (regional, national and local-community) that ensures the participation and involvement of stakeholders at different levels, but also a participatory and inclusive planning, development and implementation strategy, in addition to the development of methodologies, protocols, processes, products and services that can be extended regionally and replicated in other countries to meet their particular needs and support their decision-making and planning processes. Specifically, the financial sustainability of the project is a central element that will be addressed through socioeconomic analyses that will underpin and support the development of policies and legal and financial mechanisms that will help ensure the continuity and sustainability of the operations related to the CAFDMC and the production of the necessary hydrometeorological and water resources information for decision-making. Lessons will be collected, and cooperation sought with other regional flood and drought monitors and guidance systems[6].

A post-project monitoring and evaluation tool will be provided to the local agencies in charge of early warning system and people's committee/associations so that regular monitoring and evaluation of the proposed activities continue beyond the life of the project.

## PART III: IMPLEMENTATION ARRANGEMENTS

The WMO will be the overall implementing entity. It will provide overall management, technical guidelines and support, as well as allocation of financial resources to the other executing agencies which are integrated by the GWP, CRRH, and NMHSs.




WMO will rely on its extensive expert network as well as relevant technical commissions and research board to provide technical support, ensuring compliance with international standards and guidelines and participate in oversight functions, when necessary, as well as in compilation of best practices and recommendations to scale up the project across CA, and ensure alignment with initiatives such as Early Warnings for All (EW4All).

The execution of the project will depend mainly on the NMHSs and CRRH. The latter will integrate and operate a project implementation unit, in charge of the procurement and contracting processes. For such purpose CRRH will maintain a close relation and coordination with the NMHS's and through they with other regional and national authorities, as necessary, as well as with stakeholders at the community level (Annex 4 provides a stakeholder mapping). WMO, GWP, CRRH, and NMHSs will work in a coordinated manner to carry out activities within the framework of their technical programs and joint initiatives. Annex 5 provides more information on the selection of the regional executing entities.

[6] such as the North American Drought Monitor, Latin America Flood and Drought Monitor, Central America Flash Flood Guidance System (CAFFGS), and the Regional Water Centre for Arid and Semi-Arid Regions of Latin America and the Caribbean (CAZALAC).

## 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.*

| | |
|---|---|
| *H.E. Carlos Isaac Perez Mejia*<br>*Vice-Minister of Strategic Management*<br>*Ministry of Environment and Energy*<br>*Email: cperez@minae.go.cr*<br>*vicegestionestrategica@minae.go.cr* | Date*: June 7, 2024* |
| *S.E Milciades Concepcion*<br>*Minister of Environment*<br>*Ministry of Environment*<br>*Email: mconcepcion@miambiente.gob.pa* | Date*: May 21, 2024* |

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

| | |
|---|---|
| I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans 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*<br>Moyenda Chaponda<br>Implementing Entity Coordinator<br>Development Partnerships Office, WMO | |
| Date: *June 27, 2024* | Tel. and email: +41 22 730 8646 and mchaponda@wmo.int |
| Project Contact Person: Luis Roberto Silva Vara | |
| Tel. And Email: +41 22 730 8488 - LSilvaVara@wmo.int | |

[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.

07th June 2024
DVGE-109-2024

To: Adaptation Fund
c/o: Adaptation Fund Board Secretariat
E-mail: Secretariat@Adaptation-Fund.org

Subject: Endorsement letter for the pre-concept note of "Adapting national and regional Water Resources Management to climate extremes through Hydro-climatic Information, Early Warning Systems and Decision Support Tools"

In my capacity as the designated authority for the adaptation fund in the Republic of Costa Rica, I confirm that the above regional project proposal aligns with the government's national and regional priorities in implementing adaptation activities to reduce adverse impacts and risks posed by floods and droughts in the country.

Accordingly, I endorse the above project proposal with appreciation of the support from the adaptation fund. If approved, the project will be implemented by the World Meteorological Organization (OMM) and executed by the Comité Regional de Recursos Hídricos (CRRH), the Global Water Partnership (GWP) and the World Meteorological Organization (OMM), in close coordination with the Instituto Meteorológico de Costa Rica (IMN).

Sincerely,

Ing. Carlos Isaac Pérez Mejía
Vice- Minister of Strategic Management
Ministry of Environment and Energy

Cc: Franz Tattenbach Capra, Ministro de Ambiente y Energía
Adriana Bonilla, Directora Cambio Climático MINAE
Archivo / Consecutivo

REPÚBLICA DE PANAMÁ
GOBIERNO NACIONAL

MINISTERIO DE AMBIENTE

Panamá, 21 de mayo de 2024
DM-0921-2024

To: Adaptation Fund

**Ref.: Subject: Endorsement letter for the pre-concept note of "Adapting national and regional Water Resources Management to climate extremes through Hydro-climatic Information, Early Warning Systems and Decision Support Tools"**

In my capacity as the designated authority for the adaptation fund in the republic of Panama, I confirm that the above regional project proposal aligns with the government's national and regional priorities in implementing adaptation activities to reduce adverse impacts and risks posed by floods and droughts in the country.

Accordingly, I endorse the above project proposal with appreciation of the support from the adaptation fund. If approved, the project will be implemented by the World Meteorological Organization and executed by the Comité Regional de Recursos Hídricos, the Global Water Partnership and the World Meteorological Organization, in close coordination with the Instituto de Meteorologia e Hidrologia de Panamá.

Sincerely,

REPÚBLICA DE PANAMÁ
DESPACHO DEL MINISTRO
MINISTERIO DE AMBIENTE

S.E. Milciades Concepcion
Minister of Environment
Ministry of Environment
Email: mconcepcion@miambiente.gob.pa

MC/DL/qm

C.c.: Adaptation Fund Board Secretariat
e-mail: Secretariat@Adaptation-Fund.org

ADAPTATION FUND

**Project Formulation Grant (PFG)**

Submission Date: 01 July 2024

**Adaptation Fund Project ID:**
**Country/ies**: Costa Rica and Panama
**Title of Project/Programme**: Adapting national and regional Water Resources Management to climate extremes through Hy-dro-climatic Information, Early Warning Systems and Decision Support Tools (working title)
**Type of IE (NIE/MIE):** MIE
**Implementing Entity:** World Meteorological Organization
**Executing Entity/ies:** National Meteorological and Hydrological Services of the targeted two Countries (Costa Rica's National Institute of Meteorology (IMN), Costa Rican Institute for Electricity (ICE), and Panama's National Institute of Meteorology and Hydrology (IMHPA);
**Regional entities**: Global Water Partnership (GWP), Regional Committee for Water Resources (CRRH)

## A. Project Preparation Timeframe

| | |
|---|---|
| Start date of PFG | **October 2024** |
| Completion date of PFG | **March 2025** |

## B. Proposed Project Preparation Activities ($)

Describe the PFG activities and justifications:

| List of Proposed Project Preparation Activities | Output of the PFG Activities | USD Amount |
|---|---|---|
| Support for development of concept note | Full descriptions of:<br>- scope of interventions in the countries,<br>- mechanisms of interventions,<br>- institutional interactions,<br>- inclusion of gender and vulnerable groups,<br>- coordination with other projects in the region | 10,000 |
| Organize and hold a partners' workshop | Workshop for regional and national partners<br><br>Validated concept note<br><br>Agreed tools and methodologies to be applied<br><br>Agreed implementation | 10,000 |

| | | |
|---|---|---|
| | arrangements and distribution of tasks<br><br>Pilot areas selected | |
| Total Project Formulation Grant | | 20,000 |

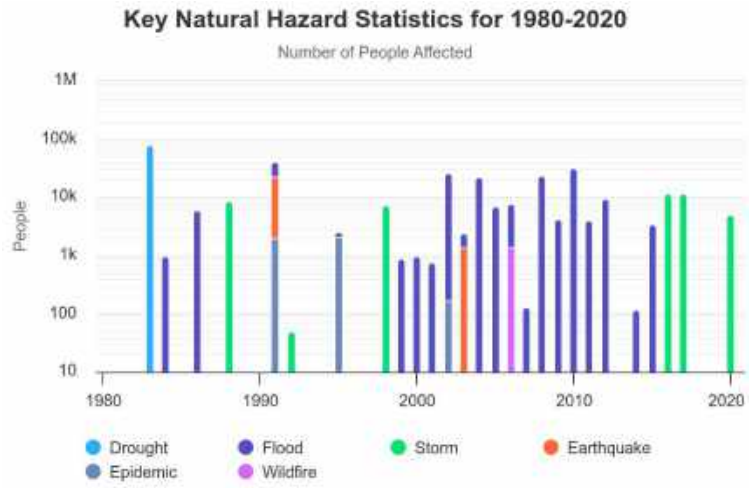
**C. Implementing Entity**

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, World Meteorological Organization | Moyenda Chaponda | 01, July 2024 | Luis Roberto Silva Vara | +41 22 730 8488 | LSilvaVara@wmo.int |

**ANNEX 1 Additional context**

The occurrence of climate-related disasters in Latin America has already increased by a factor of 2.4 since 1970. Panama experiences a series of extreme weather events including intense and protracted rainfalls (heavy storms), floods, droughts, and El Nino Southern Oscillation impacts. Between 1982 and 2008, Panama was struck by 32 natural disaster events, with total economic damages totaling an estimated US$86 million. In addition, loss of human life during these events totaled 249. Panama ranks 14th among countries most exposed to multiple hazards based on land area. The country has 15 percent of its total area exposed and 12.5 percent of its total population vulnerable to two or more hazards. In addition, Panama ranks 35th among countries with the highest percentage of total population considered at relatively high mortality risk from multiple hazards[8].




Due to a combination of geographic variations and economic factors, Costa Rica is highly vulnerable to extreme climate events and natural hazards. Part of this vulnerability is due to the presence of populations in vulnerable areas. Costa Rica presents important vulnerabilities to global warming, including quick developing events and slow onset events. Events such as floods affected 1,311,024 people between 1980 and 2017; some were affected, others lost or suffered damage to their property, were evacuated or suffered indirect or secondary damage associated with a disaster. Between 1980 and 2017, 546 people lost their lives due to floods. Between 1988 and 2018, the agricultural sector in the central region suffered economic damages of between ₡150-300 million (99.98% of the total value of damages) caused by droughts.

**ANNEX 2 Detailed description of the Components, Outputs and Outcomes**

The Project addresses most of the hydrometeorological and water resources challenges identified in the Countries Roadmaps developed in 2021 and 2022. Since the issues are multiple the proposal integrates the more relevant into 3 components: i) Infrastructure, institutional set-up and processes for risk knowledge and Early Warning, ii) Flood and drought management and risk mitigation enhancement from regional to local, and iii) Enabling environment for flood and drought resilience building.

The first component focuses mainly on both countries but also on improving the present regional capabilities. To strengthen the national capacity for observing and monitoring hydromet, and climate related hazards in a permanent and sustainable manner due to the present limited installed capacity on both countries in some basins. This means the need to redesign and modernize the monitoring networks in selected basins (including transboundary) and to develop an operation and maintenance strategy to keep them monitoring and providing important data and information for decision makers and planners. The goal is to make the best use of the present and future resources for hydrometeorological monitoring. Innovative solutions for enhancing the hydromet networks will be explored and tested.

Also, the component aims to complete the national hydromet data and integrate national databases (inexistent as of today), as well as to enhance the dissemination (critical issue reported by the public and sectoral users) and utilization of climate and hydromet data (main concern of the national hydromet authorities). The national databases and their utilization will also improve the knowledge at the regional level and their products and provide useful elements for the Climate and Hydrological forums that take place annually in the region with the participation of all Central America countries.

[8] https://climateknowledgeportal.worldbank.org/country/panama/vulnerability

Even though both countries do monitor and forecast, their installed capacity against floods and droughts is limited and the early warning systems are not common tools at the local level. Therefore, other outputs and outcomes of the component aim to reinforce the regional and national capacity for monitoring and forecasting of hydromet hazards (droughts and floods). Developing methodologies and implementing forecasts of two of the main hydrometeorological hazards of the region (droughts and floods), as well as designing and operationalizing ad hoc gender and socially-inclusive early warning systems (EWS) at the national and regional level. This EWS will be strengthened with the hydrological status and outlook products (sub-seasonal to seasonal) for priority basins generated according to international guidelines and end-users needs at sectoral levels.

In both countries the hydrometeorological data and information is not appreciated, resulting in underestimating budgets and the institutional requirements. To take that into account, component one also aims to highlight the relevance of the hydrometeorological information through the development of socioeconomic benefit (SEB) analysis. The benefits for strategic sectors, besides the obvious disaster risk reduction, will be highlighted and disseminated. The analysis will be done using international tools and best practices, particularly applicable for the Central America context.

The second component focuses mainly on the regional level strengthening drought and flood risk knowledge and multi-hazards early warning capacities, aim to establish the Central America Flood and Drought Management Center (CAFDC) and functioning in an articulated manner with the support of the NMHSs. It is thought to be run and be a support for the Comité Regional de Recursos Hidráulicos (CRRH) which is an intergovernmental technical organization of the Central American Integration System (SICA). The CRRH has more than 30 years of operation in Central America, and it is based in Costa Rica. The CAFDC will also assess flood and drought risk and set the baseline for priority basins. This also implies the development and implementation of decision-support systems at a national level for better water demand management.

Implementation of national outlook forums and reinforcement of existing national drought and flood planning mechanisms in such sense, both in Costa Rica and Panama, are to be reinforced to encourage and support the inclusive and gender mainstreaming engagement of all stakeholders, end-user, and local communities to identify climate and hydrology products and services according to their needs. Therefore, the outputs and outcomes of this component also aims to enhance the use and exploitation hydro-climatic information for climate change adaptation and resilience through the establishment of hydrological and climate outlook forums at a national, transboundary, and local level with participation of end-users in relevant sectors (disaster risk reduction, water resources, agriculture, energy, and water supply). Both countries will have pilot prioritized basin projects where community-level climate-resilient drought and flood risk management plans will be developed for vulnerable communities.

The outcomes and outputs of third and last component (Enabling environment for flood and drought resilience building) applies for both countries and at the regional level and focus on building capacity for all stakeholders at regional, national, and local level, as well as updating policy and governance mechanisms and instruments for strengthening capacity and institutional coordination at all stages. This is a transversal component since the topics and governance cover the other two components` themes and issues. It is worth noting this will include a people-centred approach with participatory mechanisms.

An important aspect of this third component is to establish a framework for sustainability of hydrometeorological services embedded in national legal instruments, including ministerial decrees. This will provide the necessary institutional support for the meteorological and hydrological national authorities to continue running their institutions and complying with their responsibilities to cope with the present budget and personnel reductions. This has been particularly critical in the last years when the staff has diminished, and the professionals not replaced.

Three important outputs to enhance institutional capacity, stakeholders' awareness and gender mainstreaming for integrated drought and flood management are related to the gender action plans, the comprehensive training and education programs for all stakeholders, and knowledge management and community of practice on climate-resilient flood and drought management. All of them aim for improving the

resilience and the equal participation to address floods and droughts at the local, national, and regional level.

**ANNEX 3 Summary of the National Roadmaps**

The national roadmaps for Panama and Costa Rica focus on enhancing hydrometeorological services to address increasing flood and drought hazards, driven by climate change. They aim to improve their hydrometeorological infrastructure, data management, services provision, and institutional capacities. Both countries plan their roadmap implementation addressing short- (1,2 years), medium (2-5 years), and long-term goals (more than 5 years). These roadmaps are based on the findings of national assessments on hydrometeorological services in the countries.

Both Panama and Costa Rica aim to: (1) strengthen institutional frameworks and governance for hydrometeorological services, (2) improve infrastructure for data collection and processing, (3) enhance operational capabilities and product development, and (4) ensure timely and efficient dissemination of hydrometeorological information to support decision-making in various sectors.

Costa Rica's Roadmap focuses on (1) Addressing gaps in the national hydrometeorological network and clarify institutional roles; and (2) Strengthing the capacities of the National Institute of Meteorology (IMN) and the Costa Rican Institute for Electricity (ICE). The estimated cost of implementation is US$61.3 million plus additional project coordination costs of US$2.5 million for four years.

The roadmap's different actions and recommendations considered are grouped into the following three lines of action: Line 1: Actions for the design and implementation of a national hydrometeorological network (Create a comprehensive network for hydrological and meteorological data collection to improve spatial and temporal coverage); Line 2: Actions for the design and implementation of a national hydrological service (improve data processing, quality control, and the development of hydrological products and implement a national hydrometeorological database and ensure data exchange among institutions); and Line 3: Actions to strengthen CONAHyME (enhance collaboration between IMN, ICE, and other institutions through the National Committee of Hydrology and Meteorology (CONAHYME).

Panama's roadmap focuses the (1) Transition from the Hydrometeorological Department (DH-ETESA) to the newly created National Institute of Meteorology and Hydrology (IMHPA); and (2) Development of a national climate database management system. The estimated cost of implementation is US$147.9 million plus additional project coordination costs of US$2 million for four years.

The roadmap's different actions and recommendations considered are grouped into the following four lines of action:Line 1: Actions for institutional strengthening and development (Establish clear governance frameworks and enhance staff capacities through training and development); Line 2: Actions to strengthen infrastructure (Modernize and expand hydrological networks to cover 23 additional basins); Line 3: Actions to strengthen the forecast and hydrometeorological and climate surveillance (Implement robust data ingestion systems and address gaps in data quality and availability & develop an integrated forecasting system and automate processes to improve operational practices); and Line 4: Actions for the development and implementation of services (implementation of a national services framework)

**ANNEX 4 Initial stakeholder Mapping**

An initial stakeholder mapping was performed (see figure 1). The identified institutions that directly participate in the generation and provision of products and services are: the National Meteorological Institute of Costa Rica (IMN), the Costa Rican Institute of Electricity (ICE) and the Institute of Meteorology and Hydrology of Panama (IMHPA). These actors are complemented by the Executive Secretariat of the Regional Committee on Hydraulic Resources (CRRH) of Central America for their organizational, integration and coordination capacities at the regional level.

The aforementioned central stakeholders are accompanied by other institutions that have some installed capacities at the national level, although limited, and that therefore have a need for data and information that complements their own for the purposes of fulfilling the responsibilities imposed on them by their corresponding mandates. For Costa Rica, these are: Institute of Aqueducts and Sewers (AyA), the National Service of Groundwater, Irrigation and Drainage (SENARA), the Ministry of Environment and Energy (MINAE), through its Water Directorates (DA-MINAE) and Climate Change Directorates (DCC-MINAE); the University of Costa Rica (UCR), the University National of Costa Rica (UNA), and the Banana Corporation of Costa Rica (CORBANA). For Panama, these are: Panama Canal Authority (ACP); the Civil Aeronautics Authority (AAC); the Institute of Agricultural Innovation of Panama (IDIAP); the Ministry of Environment (MiAmbiente), through its Directorates of Water Security (DSH), Climate Change (DCC) and Environmental Information (DIA); and the Technical Secretariat of the National Water Council (CONAGUA).

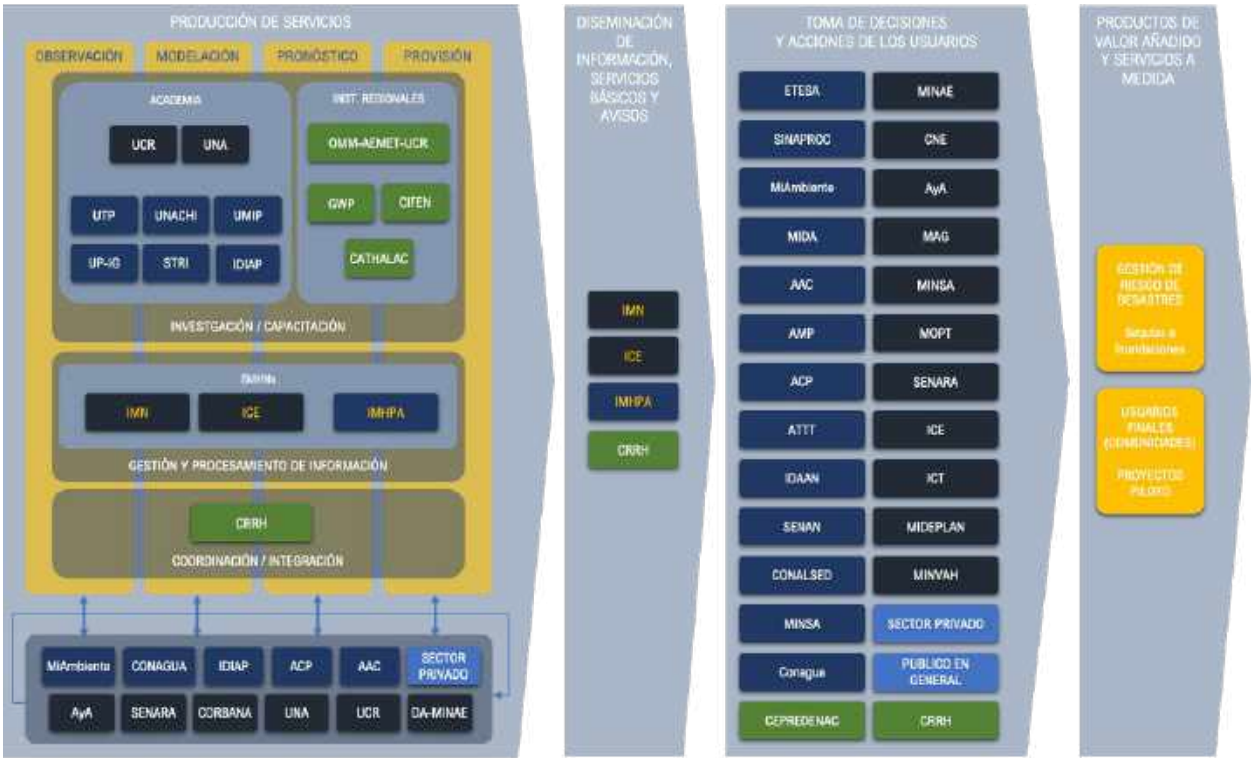



*Figure 1. Stakeholder mapping in terms of hydromet services for Costa Rica and Panama.*

Institutions contribute and generate added value through research, development and training actions, as well as contribute to the training and training of personnel, such as the case of the National University of Costa Rica (UNA); the Technological University of Panama (UTP); the University of Panama, particularly through its Institute of Geophysics (IG-UP); the Autonomous University of Chiquirí (UNACHI); the Panama International Maritime University (UMIP); the Smithsonian Tropical Research Institute (STRI); and the Institute of Agricultural Innovation of Panama (IDIAP); as well as institutions with regional or international presence, such as the University of Costa Rica (UCR), and the Spain's State Meteorological Agency (AEMET), both recognized by the WMO as Regional Training Centers; the International Center for Research on the El Niño Phenomenon (CIIFEN), and the Water Center for the Humid Tropics for Latin America and the Caribbean (CATHALAC).

In relation to information users, several actors use the information for decision making and have their own capabilities for processing and generating derived products and services linked to, among others, drought and flood risk management. For Costa Rica, such is the case of the Ministry of Agriculture and Livestock (MAG); the National Commission for Risks and Emergency Response (CNE); the Ministry of Health (MINSA); the Costa Rican Institute of Tourism (ICT); the Ministry of Public Works and Transportation (MOPT); and the Ministry of Housing and Human Settlements (MIVAH), the Ministry of National Planning

and Economic Policy (MIDEPLAN). For the case of Panama, these are the Electric Transmission Company (ETESA); the National Civil Protection System (SINAPROC); the Civil Aeronautical Authority (AAC); the Maritime Authority of Panama (AMP), the Panama Canal Authority (ACP); the Institute of National Aqueducts and Sewers (IDAAN); the Ministry of Agricultural Development (MIDA); and the National Aeronaval Service (SENAN); the Directorate of the Drinking Water and Sanitary Sewage Subsector of the Ministry of Health (DISAPAS-MINSA); the National Council for Sustainable Development (CONADES); the National Committee to Fight Drought and Desertification (CONALSED); and the Land Transit and Transportation Authority (ATTT).

Finally sectoral institutional users and the general public will require value-added and tailored products and services, particularly linked to droughts and floods. Of special importance in this group are the users in the communities that will be identified as part of the pilot projects in Costa Rica and Panama.

**ANNEX 5 Executing entities for regional activities**

WMO and the Inter-American Development Bank (IDB) worked together with National Institutions in Costa Rica and Panama to perform two detailed assessments of the Institutions providing hydrometeorological and water resources information at the national level. These national assessments, considering institutional, operational and technical aspects, were carried out during 2021. WMO is the UN system's authoritative voice on the state and behavior of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources and contributes to enhancement of hydrological services in its Member countries through a series of initiatives[9]. Moreover, WMO leads pillar 2 of the UN initiative Early Warnings for All (EW4All), “Detection, observations, monitoring, analysis and forecasting of hazards”. As such, this project will be aligned to the initiative.

The Global Water Partnership (GWP) is a multi-stakeholder action network of 3000+ partner organizations in over 180 countries dedicated to working towards equitable and efficient management of water resources for a sustainable and climate-resilient world. GWP’s Global Secretariat is the Global Water Partnership Organisation (GWPO), an intergovernmental organization based in Stockholm, Sweden. GWP operates at regional and country levels via its 13 Regional Water Partnerships (RWPs). GWP Central America (GWP CAM) is one of these RWPs, based in Honduras, with 208 partners in the region and Country Water Partnerships established in each of the six countries. GWP is a collaborating partner of WMO in the Integrated Drought Management Programme (IDMP), which supports governments and other stakeholders at all levels on implementing Integrated Drought Management by providing policy, technical and management guidance and by sharing scientific knowledge and best practices.

In this proposed project, GWP CAM will be one of the executing entities supporting the delivery of all activities at regional level and in both countries and will lead on the delivery of Component 3. GWP CAM will provide support with capacity building activities, preparation of policy instruments, inclusion of gender approach and use existing networks to facilitate the engagement of water and water-related sector stakeholders. This will help support the propagation of project benefits in both countries and ensure that project activities are closely linked to country needs and contexts while still maintaining the benefits of a regional approach.

The involvement of the Regional Water Resources Committee (CRRH), as an organization of the Central American Integration System (SICA) specialized in the issues of water, weather and climate, and with 57 years of uninterrupted operation, is a core element, together with the NMHs, which will contribute not only to the coordination and unification of national results but also to an adequate implementation of the regional component. CRRH is in the position to liaise with other SICA bodies such as the Coordination Center for the Prevention of Disasters in Central America and the Dominican Republic (CEPREDENAC) and the Central American Commission for Environment and Development (CCAD).

[9] Associate Programme on Flood Management (APFM), Integrated Drought Management Programme (IDMP), Flash Flood Guidance System (FFGS), Global Hydrometry Support Facility (HydroHub), Hydrological Status and Outlook System (HydroSOS) and WMO Hydrological Observation System (WHOS), among others.