



ADAPTATION FUND

AFB/PPRC.38/Inf.61
25 September 2026

Adaptation Fund Board
Project and Programme Review Committee
Thirty-eighth Meeting
Bonn, Germany, 19-23 October 2026

PROPOSAL FOR COSTA RICA, PANAMA



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT
TECHNICAL REVIEW OF PROJECT PROPOSAL FOR
"ENHANCING CLIMATE CHANGE ADAPTATION CAPACITY IN CENTRAL AMERICA WITH
FOCUS ON COSTA RICA AND PANAMA: IMPROVING HYDROCLIMATIC AND EARLY
WARNING SYSTEMS AND INTEGRATING WITH WATER RESOURCES MANAGEMENT "

Project Title	Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Improving Hydroclimatic and Early Warning systems and integrating with Water Resources Management
Project ID	AF00000398
Category	Regular size project (over \$1 million)
Type	Regional project
Stage	Concept
Country	Regional (Costa Rica, Panama)
Implementing Entity	WMO
Financing Requested	USD 22,859,155.00
Reviewer	Gisela Ferrari

Co-reviewer(s)

IE Contact Person

Ana Laura Zuanazzi, Federico GOMEZ DELGADO, Moyenda Chaponda

Secretariat's Overall Comment

The project Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Improving Hydroclimatic and Early Warning systems and integrating with Water Resources Management aims to improve climate change adaptation capacity and resilience to droughts and floods in Central America through the strengthening of hydroclimatic and early warning systems and the integration of the knowledge generated in the planning and management of national and regional water resources, according to the pillars of risk management.

The proposal includes a request for a project formulation grant and/or project formulation assistance grant (PFG) of \$120,000.

The initial technical review raises some issues, such as the absence of an initial gender analysis, need for further clarity on the other participating countries in central America, cost effectiveness, strengthening alignment with national policies and standards, the environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund, discrepancy in the project funding requested as is discussed in the number of Clarification Requests (CRs) and Corrective Action Request (CAR) raised in the review.

The second technical review identifies remaining issues related to strengthening the Theory of Change, improving cost-effectiveness justification, updating environmental and social risk screening, expanding the gender analysis, and ensuring consistency in budgets and execution arrangements, as reflected in the CRs and CARs.

Country Eligibility

Are all of the participating countries party to the Kyoto Protocol, or the Paris Agreement?

Response: Yes

Secretariat: Both participating countries, Panama and Costa Rica, are parties to the Paris Agreement and the Kyoto Protocol. Panama ratified the Kyoto Protocol in 1999 and the Paris Agreement in 2016. Costa Rica ratified

the Kyoto Protocol in 2002 and the Paris Agreement in 2016.
(September 2, 2026)

Are all of the participating countries developing countries particularly vulnerable to the adverse effects of climate change?

Response: Yes

Secretariat: Both countries are developing countries particularly vulnerable to the adverse effect’s climate change Both Panama and Costa Rica are exposed to drought and floods. The background mainly focuses on Central America while the countries of focus, Panama and Costa Rica are only mentioned briefly.

CAR 1: Please submit LOEs in the re-submission for all the participating Central American countries participating in this proposal.
(August 18, 2025)

Response: No

Secretariat: Both participating countries are vulnerable to the adverse effects of climate change. Costa Rica is particularly vulnerable to climate change, with significant exposure to droughts, floods, and extreme precipitation. These hazards have caused substantial impacts on agriculture, hydropower, tourism, infrastructure, and livelihoods, and are projected to increase in frequency and intensity. Panama is vulnerable to multiple climate hazards, particularly droughts, floods, and increasing water stress. These impacts affect key sectors including hydropower, agriculture, tourism, and the Panama Canal, with climate projections indicating increasing temperatures, more erratic rainfall, longer dry periods, and more intense rainfall events.

CAR 1: Not cleared.
The proposal has been revised to clearly establish Costa Rica and Panama as the only countries covered by the project. References to Central America are maintained only where relevant. LOEs were submitted, dated July 1, 2025 for Panama and July 22, 2026 for Costa Rica. Considering the above, no additional LOEs are required. However, please clarify that the Regional/Transboundary area refers only to the Sixaola Basin, which is shared between Costa Rica and Panama.
(September 2, 2026)

Project Eligibility

Have the designated government authorities for the Adaptation Fund from each of the participating countries endorsed the project/programme?

Response: Yes

Secretariat: As per the Endorsement letter dated July 1, 2025, for Panama, and July 24, 2025, for Costa Rica.
(August 18, 2025)

Response: Yes

Secretariat: As per the Endorsement letters dated July 1, 2025 for Panama and July 22, 2026 for Costa Rica.
(September 2, 2026)

Does the length of the proposal amount to no more than fifty (50) pages for the project/programme concept, including its annexes?

Response: Not Cleared

Secretariat: CAR2: Kindly revise the concept to no more than fifty (50) pages including its annexes.

CAR3:

1. Since this is a first submission of the Concept Note proposal, kindly resubmit a clean version without the track changes and comments.
2. In addition, kindly translate Figure 3, and other Spanish words across the document to English.

Note: To improve the presentation of the document.

1. Kindly ensure all tables are numbered for easier reference.
2. Kindly also ensure that document formatting and punctuation across the proposal done.

(August 18, 2025)

Response: Not Cleared

Secretariat: CAR 2: Not cleared.

1. The Concept Note currently has 55 pages. Please reduce the length to no more than 50 pages and add page numbers throughout the whole document, including the annexes.
2. Please ensure consistency of component numbers, names, and amounts throughout the Concept Note proposal and in the Adaptation Fund portal.

CAR 3: Cleared.

1. The reviewed Concept Note proposal was re-submitted in clean and track changes versions.
2. Figure 3 (now Figure 4) has been translated into English, along with other terms throughout the document.

CAR 3 (New): Please ensure that all tables and figures are numbered consistently throughout the document. The proposal would benefit from including a Table of Contents, as well as Lists of Tables and Figures. Please review the document formatting for consistency and coherence throughout.

(September 2, 2026)

Does the regional project / programme support concrete adaptation actions to assist the participating countries in addressing the adverse effects of climate change and build in climate resilience, and do so providing added value through the regional approach, compared to implementing similar activities in each country individually?

Response: Not Cleared

Secretariat: Yes, but further information is needed. The project aims to strengthen institutional infrastructure at regional, national and sub-national levels, to improve risk awareness and early warning. It contributes to the themes of disaster risk reduction and early warning systems and transboundary water management.

CAR4: Kindly provide a detailed Theory of Change to clearly illustrate the logical connections between activities, outputs, and outcomes. Ensure that the proposed activities are directly aligned to addressing the threats anticipated under the projected climate scenarios. In addition, project outcomes described in the table on page 7 are not included in section A on the description of the project/programme components. Please clarify and/or correct.

CR1: Kindly include the project outputs in the description of the project components from pages 11-18, and a description of the activities to be undertaken under each output.

(August 18, 2025)

Response: Not Cleared

Secretariat: CAR 4: Not cleared.

1. Figure 3 illustrating the Theory of Change has been added to the document. However, the Theory of Change should be updated to explicitly incorporate the project's four components and their corresponding outcomes. The current TOC presents activities, outputs, and a final impact, but does not reflect the component structure nor the expected outcomes defined in the results framework. Please revise the TOC to present a coherent results chain from constraints → components → activities → outputs → outcomes → impact. Please also include key risks and assumptions.

2. Section A provides a coherent description of the project components, the concrete adaptation activities, their contribution to climate resilience, and the added value of the regional approach. Please strengthen the explicit linkages between the described activities and the corresponding outputs and outcomes presented in Table 9 and further emphasize the comparative advantage of the regional approach.

CR 1: Not cleared. The requirement to present the project outputs together with the activities under each output has been addressed through Table 1, which clearly organizes components, outcomes, outputs and activities. However, this table is highly repetitive with the mandatory "Project/Programme Components and Financing". It is recommended to use it as an optional annex. Please remove duplications (e.g., Output 1.2.1) and ensure consistent wording across entries to avoid confusion.

(September 2, 2026)

Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy of the Fund?

Response: Not Cleared

Secretariat: Unsure. On page 22 a breakdown of the beneficiaries is included. 2,106,000 people (918,000 in Costa Rica and 1,188,000 in Panama) will benefit from drought and flood management and contingency plans, including participatory and inclusive plans for vulnerable communities and end users. 550,988 inhabitants in vulnerable communities will have access to early warning systems designed inclusively, with products and services tailored to their needs and training to utilize them effectively. The project will define the percentage of women, youth, elderly, indigenous people, Afro-descendants, and people with disabilities participating in activities to strengthen social inclusion and gender equity. An initial gender analysis is however not included.

CAR5: Please incorporate an initial gender analysis that outlines the distinct needs, capacities, roles, and knowledge resources of women and men, and/or highlights how evolving gender dynamics could contribute to sustainable transformative change.

CAR6: Please provide beneficiary information for ‘Central America’.

(August 18, 2025)

Response: Not Cleared

Secretariat: CAR 5: Not cleared. The Initial Gender Analysis provides a useful preliminary overview of gender inequalities in Costa Rica and Panama; however, further information is required. Please expand the analysis to include a clearer description of the main gender gaps relevant to the project’s scope, particularly those affecting access to hydrometeorological information, participation in early warning systems, decision making roles in water management, differentiated exposure to climate risks, and barriers to benefiting from project activities. Annex 4 should contain the complete initial gender assessment, including quantitative and qualitative evidence and an intersectional analysis covering indigenous, Afro descendant, rural, youth, and persons with disabilities. Please note that any annex forms part of the Concept Note package, must be submitted in English, and must remain within the 50-page limit.

CAR 5.1: Please clearly state in the main Concept Note document—not only in Annex 4—that a full gender assessment and a costed Gender Action Plan will be prepared during the development of the fully-developed proposal.

CAR 6: Cleared. Information of beneficiaries in Costa Rica and Panama is provided in Part II Section C.
(September 2, 2026)

Is the project / programme cost-effective and does the regional approach support cost-effectiveness?

Response: Not Cleared

Secretariat: Yes, but further justification is needed. The project is adopting a cost-effectiveness approach by reducing potential damage to infrastructure, housing, crops, and livestock, thereby safeguarding critical assets. Timely early warnings are expected to lower response and recovery expenditures by minimizing reliance on costly post-disaster interventions. In addition, improved water resource management will enable more efficient allocation and optimization of use. Finally, data-driven planning will strengthen decision-making processes, reduce risks, and enhance overall resilience.

CAR7: However, kindly provide a sound justification for the cost-effectiveness of selected measures, including alternative options to the proposed measures, and estimates of the evaluation where possible. Consider using a comparative table showing cost effectiveness of each measure compare to alternative option or Business as usual.

(August 18, 2025)

Response: Not Cleared

Secretariat: CAR 7: Not cleared. The CN includes a justification for the regional approach and Table 2 in Part II Section C was incorporated to compare the cost effectiveness of proposed measures against business-as-usual scenarios. However, further information is needed to fully demonstrate cost effectiveness. In particular, the analysis should more clearly articulate how the regional approach delivers measurable efficiency gains compared to two standalone national projects, and should include alternative options considered, not only the business-as-usual scenario. The comparative table would benefit from brief quantitative or indicative cost estimates where possible, and clearer justification for the “High” and “Low” ratings assigned. Strengthening these elements will provide a more robust justification of the selected regional intervention model.

(September 2, 2026)

Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments? If applicable, it is also possible to refer to regional plans and strategies where they exist.

Response: Not Cleared

Secretariat: Yes, but further clarification is needed. The concept includes a table of the relevant national and regional plans and strategies, given for each country.

CAR8: Kindly revise the table 1 and 2 with an English translation of the proposed national and regional strategies and plans.

CR2: Kindly include any national meteorological plans and related documents for the participating countries.
(August 18, 2025)

Response: Not Cleared

Secretariat: CAR 8: Not cleared. Please revise Tables 3 and 4 in Part II, Section E to include regional strategies and plans. Regional frameworks relevant to the project's scope such as the SICA Regional Climate Change Strategy, the CRRH Regional Hydrometeorological Strategy, the CENTROCLIMA regional climate information platform framework, the CEPREDENAC Regional Disaster Risk Reduction Policy, the WMO EW4All regional roadmap, and the Binational Sixaola Basin Strategic Action Framework should be reflected. In addition, for Panama, please review whether the inclusion of the National Integrated Waste Management Plan is relevant to the project scope.

CR2: Cleared. Tables 3 and 4 include national meteorological plans and related documents for both participating countries.
(September 2, 2026)

Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?

Response: Not Cleared

Secretariat: Yes, on page 29. However further information is required.

CR3: Kindly also include the relevant gender laws that the project will be aligned with in ensuring inclusion of vulnerable communities to in Part II section F of the proposal.

(August 18, 2025)

Response: Not Cleared

Secretariat: CR 3: Not cleared. A paragraph describing the relevant gender laws has been added in Part II, Section F. Please also review whether the legal and policy frameworks related to vulnerable groups should be further reflected.

(September 2, 2026)

Is there duplication of project / programme with other funding sources?

Response: Not Cleared

Secretariat: No. The proposal lists on planed, ongoing and recently completed project that are complimentary and could possibly overlap in table 3.

CR4: Kindly list the project identified as “various” in row # 6.

(August 18, 2025)

Response: Not Cleared

Secretariat: CR 4: Not cleared. In Part II Section G, please revise and reorganize Table 5 ensuring that each project clearly presents: (i) lessons learned, (ii) period of execution, (iii) geographic/thematic overlap, (iv) identified synergies, and (v) non duplication. This will strengthen the analytical clarity of the section and demonstrate how the project builds on existing initiatives while avoiding overlap.

(September 2, 2026)

Does the project / programme have a learning and knowledge management component to capture and feedback lessons?

Response: Cleared

Secretariat: Yes. Component 4, output 4.2.2 Knowledge management and community of practice on climate-resilient flood and drought management established. The project intends to create a regional digital platform that functions as a repository of data, tools, case studies and lessons learned.

(August 18, 2025)

Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender

Policy of the Fund?

Response: Not Cleared

Secretariat: Yes, on page 36. However further information is required. Institutions consulted include ministries, universities, basin committees, and civil society organizations and summed up on page 36. There were no institutions or stakeholders representing any vulnerable groups who participated in the consultations.

CR5: Please include evidence of the consultation with any institution representing vulnerable groups and indigenous populations and how this has been taken account into the proposal design.

(August 18, 2025)

Response: Not Cleared

Secretariat: CR 5: Not cleared. Please include evidence of consultations with institutions representing vulnerable groups and Indigenous Peoples and clearly indicate how their inputs have been incorporated into the project design. Useful information is provided as part of the response to the first technical review; however, please ensure that this evidence is explicitly incorporated into the Concept Note proposal. Please also note that any annex used to reflect these consultations must be submitted in English and must remain within the overall 50-page limit for the Concept Note proposal and annexes.

(September 2, 2026)

Is the requested financing justified on the basis of full cost of adaptation reasoning?

Response: Not Cleared

Secretariat: Yes, but further clarification is needed. The project is meant to lead to reduction of economic losses from disasters related to droughts and floods; Improved water resource management for agriculture, energy, and drinking water and optimization of public investment by shifting focus from reactive to preventive measures.

CAR9: Please confirm that there is no co-financing expected and that AF funding will be able to deliver its outcomes and outputs regardless of the success of any other leverage or co-financing.

(August 18, 2025)

Response: Not Cleared

Secretariat: CAR 9: Not cleared. The response provided in the response table for the first technical review is appropriate; however, please ensure that the Concept Note explicitly states that there is no co-financing expected and that Adaptation Fund resources alone will be able to deliver all outcomes and outputs, regardless of the success of any additional leverage or co-financing efforts.

(September 2, 2026)

Is the project / program aligned with AF's results framework?

Response: Not Cleared

Secretariat: Yes, but further clarification is needed. Component 1 in table 5 is stated to align to Fund Outcome Indicator 4.2 Physical infrastructure improved to withstand climate change and variability-induced stress.

However, none of the outputs described under this component are in climate proofing of infrastructure.

CAR10:

1. Please indicate which outputs and activities will contribute to the fund indicator of improving infrastructure to withstand climate change and variability-induced stress.
 2. At Part II Section B, please indicate the alignment with the results areas of the fund.
 3. Please rationalize the figures for the components which is currently presented at \$18,956, 000 in Project/Programme Components and Financing table and as \$11, 517,000 in table 5.
- (August 18, 2025)

Response: Not Cleared

Secretariat: CAR 10: Not cleared.

1. Outcome Indicator 4.2 was removed from the table, but this change is not reflected in track changes. Please ensure that the deletion is clearly marked. Also, please review the lower part of the table, where Fund Output Indicator 4.1.2 (“Number of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change”) is still included.
2. Information was added to Part II Section B. To enhance clarity, please ensure that the text explicitly references the Adaptation Fund’s Results Areas using their formal names, including Early Warning Systems; Disaster Risk Reduction; Strengthening of Climate Information Services; Resilient Infrastructure; and Strengthening of Policies and Institutional Capacity.
3. Figures of the components were correctly adjusted in both tables. In Table 9, please add a budget line for each outcome and output. Please refer to the AF Strategic Results Framework Guidance (https://www.adaptation-fund.org/wp-content/uploads/2026/07/AF-Strategic-Results-Framework-Guidance-Document_Final.pdf) (September 2, 2026)

Has the sustainability of the project/programme outcomes been taken into account when designing the project?

Response: Not Cleared

Secretariat: Yes, but further justification is needed. The project promotes sustainability by strengthening institutions and building capacity, integrating adaptation measures into public policies and governance systems, and exploring innovative financing mechanisms such as trust funds, public–private partnerships, and regional alliances.

CAR11: please clarify and strengthen the project scalability beyond the AF funding. Ref. review sheet during Pre-concept note.
(August 18, 2025)

Response: Cleared

Secretariat: CAR 11: Cleared. The section on sustainability and scalability has been strengthened (Part II Section K and Table 6).
(September 2, 2026)

Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?

Response: Not Cleared

Secretariat: No, on page 40. The project is classified as Category C. The project assumes no risks and table 4 on the comparison with the 15 principles of the adaptation fund is not filled correctly.

CAR12: In Table 4

1. In the second column on 'No further assessment required for compliance' use a check mark V where no assessment is required and leave blank where an assessment is required.
2. In the third column 'Potential impacts and risks – further assessment and management required for compliance': kindly categorise the level of risk; describe possible risks that could arise considers all potential direct, indirect, transboundary, and cumulative impacts and risks that could result from the proposed project/programme; and how the project plans to mitigate the risks.

CR7: Kindly elaborates in section L on the gender-specific cultural and/or legal context in which the project/programme will operate. Also see CAR4.

(August 18, 2025)

Response: Not Cleared

Secretariat: CAR 12: Not cleared.

1. Please note that Principles 1 (Compliance with the Law), 4 (Human Rights), and 6 (Core Labor Rights) always apply and therefore cannot be marked as requiring no further assessment (Table 7, Part II Section L).
2. (a) Each environmental and social principle in Table 7 must include a clearly stated risk level (none, low, medium, or high), a description of the risk, and a description of the mitigation measures that will be implemented to address those risks. Several principles currently rely on "further assessment required," but the Concept Note must already articulate the initial risks and the preliminary mitigation actions; (b) Please confirm that the screening process covers all potential direct, indirect, cumulative, and transboundary impacts and risks; (c) Please also clearly indicate that further evaluation of risks and impacts for each Adaptation Fund ESP principle will be undertaken during full proposal development, and that corresponding mitigation measures will be refined in the ESMP at the Full Proposal stage.

CR 7: Not cleared. Although Part II Section L identifies environmental and social risks, please further elaborate on the gender specific cultural and legal context in Costa Rica and Panama.

(September 2, 2026)

Does the project promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms?

Response: Not Cleared

Secretariat: Unsure, on page 16. Most of the solutions presented as innovations are difficult to evaluate as innovative as they are described in a general way. The use of crowdsourcing for community monitoring of drought impacts is innovative, but the concepts stated that it will be evaluated.

CR8: Kindly clarify if crowdsourcing is going to be used in the project or is still being considered and might not be used.

The project concept also states that software and the guides created through of the 3rd HydroHub innovation call results, will be incorporated, but the solutions to be incorporated are not stated.

CR9: Kindly elaborate on the innovative software and guides to be incorporated into the project.
(August 18, 2025)

Response: Cleared

Secretariat: CR 8: Cleared. Part II Section B was updated to clarify that crowdsourcing will be used in selected basins, and the specific HydroHub solutions to be incorporated is now explicitly listed, including the RIVeR-LAC open-source software, its best-practice guidelines, and the associated operational materials.

CR 9: Cleared. The description of innovative software and technical guides has been expanded in Part II Section B.
(September 2, 2026)

Resource Availability

Is the requested project / programme funding within the funding windows of the regional projects/programmes?

Response: Not Cleared

Secretariat: Yes, but further clarification needed

CR10: The CN cover page indicates a total amount of \$13,932,655 requested and a PFG of \$120,000. However, the project amount breakdown in table (page 7-9) indicates a different amount of \$22,859,155. Please revise the document and align the project amount breakdown with the funding request of \$13,932,655.
(August 18, 2025)

Response: Cleared

Secretariat: CR10: Cleared. The amount was adjusted in the cover page and in Table "Project/Programme Components and Financing"
(September 2, 2026)

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?

Response: Not Cleared

Secretariat: Unsure. The Implementing Entity Management Fee are at 8.0% however, WMO is acting as an Executing Entity as well and how much of the Programme Execution Costs being allocated to WMO is not indicated.

CAR13: Please revise the project fees and executing cost after addressing CR9 above.

CAR14: Kindly indicate how much of the Programme Execution Costs will be allocated to WMO.

CAR15: IN the PFG application form please clarify what LOA is and include the IE fee.
(August 18, 2025)

Response: Not Cleared

Secretariat: CAR 13: Cleared. EE fee is 1,825,050 USD (8.78%) and IE fee is 2,078,150 USD (10%).

CAR 14: Cleared. For the Full Proposal stage, please note that in exceptional cases where an Implementing Entity (IE) also carries out execution services, the IE must: Justify why it is best positioned to perform those execution services instead of another national or subnational entity; Limit its execution costs to 1.5% of the portion of the project it executes; and Provide strong justification endorsed by the DA.

CAR 15: Cleared. The PFG application form has been updated accordingly. The term “LOA” is clarified in now the document, and the Implementing Entity (IE) fee has been included as required.
(September 2, 2026)

Eligibility of IE

Is the project/programme submitted through an eligible Multilateral or Regional Implementing Entity that has been accredited by the Board?

Response: Cleared

Secretariat: Yes. Accreditation Expiration Date: 30 March 2027
(August 18, 2025)



ADAPTATION FUND

CONCEPT NOTE FOR REGIONAL PROJECT/PROGRAMME

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme: Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Improving Hydroclimatic and Early Warning systems and integrating with Water Resources Management

Countries: Costa Rica, Panama

Thematic Focal Area¹: Disaster risk reduction and early warning systems

Type of Implementing Entity: Multilateral Implementing Entity

Implementing Entity: World Meteorological Organization (WMO)

Executing Entities: Regional Committee for Water Resources (CRRH), Global Water Partnership Organisation (GWPO), World Meteorological Organization (WMO)

Amount of Financing Requested: 22,859,155 (in U.S Dollars Equivalent)

Project Formulation Grant Request: Yes ☒ No ☐

Amount of Requested financing for PFG: 120,000 (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 proposal has been submitted before including at a different stage (pre-concept, concept)

☐ This is the first submission ever of the concept note

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

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:

According to the World Meteorological Organization (WMO) [1][2.b], recent years have ranked among the warmest on record, reflecting the ongoing trend of rising global temperatures. Large-scale climate drivers such as the El Niño–Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD) exert a strong influence on hydroclimatic variability and extremes in many regions, including Central America. While the exact interactions between these drivers and long-term climate change are still an area of active research and can limit precise predictability, there is robust evidence that the frequency and intensity of climate extremes are increasing. These extremes manifest in multiple ways, including intense rainfall, floods, droughts, and prolonged drying periods, often accompanied by reduced river flows.

Central America² is highly vulnerable to the adverse effects of climate change. Deep economic, ethnic and social inequalities are exacerbated by climate change, affecting the most vulnerable groups to the greatest extent. High levels of widespread poverty, weak water governance, unequal access to drinking water and sanitation services, and lack of infrastructure and financing reduce adaptive capacity, increasing and creating new vulnerabilities in the population (high confidence) [5][6].

Hydrometeorological extremes pose multiple risks to society. It is estimated that more than 90% of disasters are related to this type of event. In the period 1994-2022, 321 events were recorded³ in the region, causing damages of \$21.7 billion USD, affecting 35.7 million people, of which about 25 thousand lost their lives (Fig. 1) [8]. Additionally, in a study conducted in 2024 based on data contained in the EM-DAT international disaster database between 2000 and 2020, it was found that various areas in Central America recorded the highest number of people per km² affected by climate-related disasters and extreme events⁴ [7].



Fig. 1. Impacts of climate-related disasters in Central America between 1994 and 2022. Source: EM-DAT.

Loss and damage from disasters are a great financial burden for Central American countries and these disasters limit their advancements towards sustainable development. This is evidenced clearly when disaster losses are compared to investments in various sub-sectors: in the period 2008-2021, disaster losses – of which a

² "Central America" refers to the region composed of Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.

³ Including hydrological (different types of floods and landslides), meteorological (storms and extreme temperatures), and climatological (droughts and forest fires).

⁴ The following phenomena were included in this study: drought, tropical cyclones, flash floods, river floods, forest fires, heat waves, landslides.

significant proportion result from damaged infrastructure – represented more than 70% of energy investments, a third more than the amount invested in water and sanitation, almost double the expenditure on telecommunications, and about a fifth of the total invested in transportation (Fig. 2) [10].

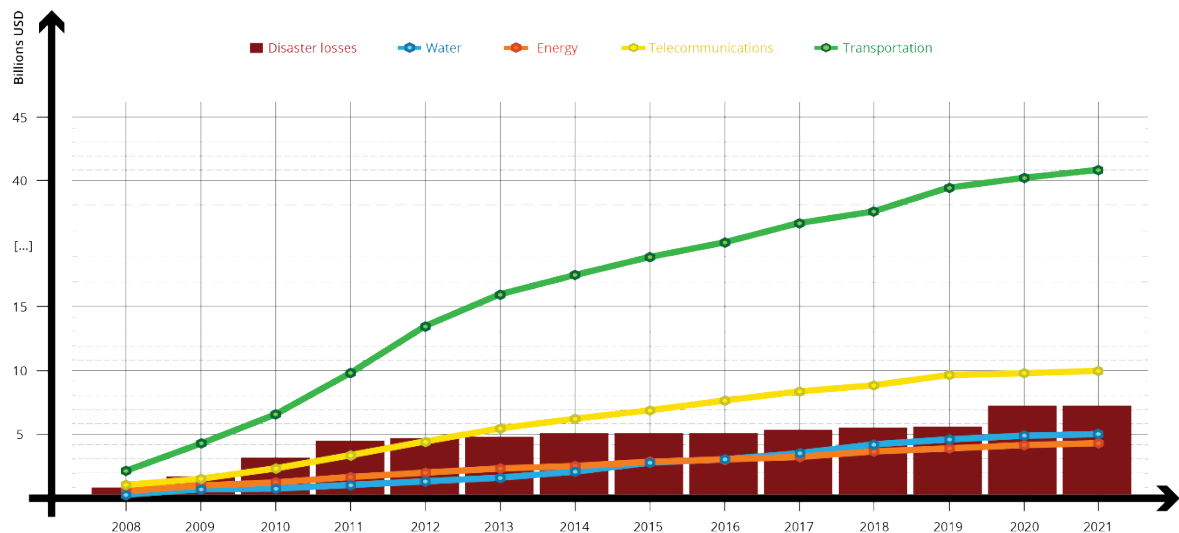


Fig. 2. Disaster losses and public investment in infrastructure by subsector in Central America (Data accumulated in the period 2008-2021). Source: Infralatam.

In order to reduce these losses, there is a substantial need for accurate and timely hydrometeorological information to support better decision-making for the protection of people, property and infrastructure. Multi-hazard Early Warning Systems (MHEWS) are a proven, effective and feasible climate adaptation measure that save lives and generate high economic returns. Studies commonly estimate that every US\$1 invested in adaptation can yield between US\$5 and US\$10 in avoided losses, where investments in early warning systems can yield the highest returns⁵. In addition, a 24-hour advance notice of an imminent hazardous event can reduce subsequent damage by up to 30% [11].

The "Early Warning for All" (EW4ALL) initiative announced by the United Nations Secretary-General on March 22, 2022, seeks to ensure that all people on Earth are protected by Early Warning Systems (EWS) within five years. Its 2023-2027 action plan, launched in November 2022 and supported by a joint declaration signed by 50 countries, specifies the path to be followed to achieve the proposed goal, prioritizing the necessary actions and investments. Its achievement will only be possible with modern science, sustainable networks of systematic monitoring, international exchange of quality data, advanced supercomputing power, forecasts based on impacts, as well as advances in telecommunications and connectivity. This means there is a need to strengthen National Meteorological and Hydrological Services (NMHSs), National Disaster Risk Management Agencies (NDRAs) and emergency preparedness measures, as well as improving and deepening the understanding of risk at all time scales [12].

In the Americas and Caribbean region, only 37% of countries reported having MHEWS in 2022, although there has been an increase from 2015 (23%). This lower coverage suggests that increased efforts to implement MHEWS are needed [13].

Costa Rica

Costa Rica faces significant climate vulnerability, with nearly 7% of its surface exposed to three or more threats, translating into the eighth highest exposure to economic risk globally. The country has experienced

⁵ Global Commission on Adaptation (2019). Adapt now: A global call for leadership on climate resilience.

increasingly severe drought events, particularly during El Niño phenomena: the 2014 drought affected approximately 8% of the national population (408,000 inhabitants), generating agricultural losses of \$34 million USD, with 80% concentrated in Guanacaste province [15] [16]; the 2014-2015 drought, identified as the most severe since 1930, caused precipitation deficits of up to 65% in the Pacific region and losses of at least \$25 million USD in agricultural and livestock production [17].

Floods represent approximately 59.4% of documented extreme events, constituting the leading cause of housing destruction, agricultural and infrastructure losses, and human casualties [18]. The most vulnerable economic sectors include: (1) hydroelectric energy (8,412 GWh in 2024, 67% of total generation), where climate variability reduced hydroelectric generation by ~12% during 2022-2023 due to the ENSO phenomenon, increasing thermal generation from 92 to 608 GWh with significant additional costs in imported fuels [19] [21]; (2) agriculture, with documented losses of \$46.5 million USD from Hurricane Otto (2016) and \$9.5 million USD in agriculture during Tropical Storm Nate (2017), whose total economic impact reached \$580.4 million USD [22] [23]; and (3) tourism, which generated over \$5.4 billion USD in 2024 and suffered estimated losses of \$2.21 billion USD between 2005-2017 due to extreme hydrometeorological events [24] [25].

Climate projections indicate increased frequency and intensity of extreme precipitation events, more extended and severe dry periods, and greater variability in hydroelectric generation, with estimates that +3°C global warming could reduce the country's GDP by more than 6% primarily due to tourism losses, heat effects on labor productivity, and agriculture [26].

Panama

Panama ranks fourteenth among countries with the highest exposure to multiple hazards, with 15% of its surface area and 12% of its total population exposed to two or more hazards [28]. The country's vulnerability is exacerbated by its unique geography, with both Pacific and Caribbean coastlines, and its critical role in global maritime commerce through the Panama Canal. Drought events have become increasingly severe: in 2019, approximately 12% of the population (528,000 inhabitants) was affected by drought conditions [15]; the 2023-2024 drought, considered the most severe in over 70 years, recorded rainfall levels 43% below the historical average, significantly affecting water availability in the Panama Canal [30].

Between 1933 and 2019, the country recorded 1,903 flood events affecting 527,394 people across 67 districts [31]. The most vulnerable economic sectors include: (1) hydroelectric energy (7,797 GWh in 2024, representing 60% of total supply, reaching up to 86% in certain months), with high vulnerability to both drought (reduced generation) and floods (infrastructure damage) [32]; (2) agriculture, contributing approximately 5.1% of GDP, with losses during ENSO events exceeding \$40 million USD in individual years, primarily affecting rice, corn, sugar cane, and vegetables, in addition to extensive livestock operations [33] [34]; (3) tourism, which generated \$6,000 million USD in 2024, particularly vulnerable in coastal and nature-based tourism areas; and (4) the Panama Canal, whose direct economic contribution represents 3% of GDP (approximately \$3 billion annually), critically dependent on adequate water supply from the watershed: during the 2023-2024 drought, Gatún Lake levels fell to 24.11 meters (historic low), forcing a 35% reduction in daily transits (from 36-38 to 24 vessels), draft restrictions from 50 to 44 feet, resulting in estimated losses of \$500-700 million USD and a 0.5-0.7 percentage point reduction in GDP [35] [36].

Climate projections indicate temperature increases of 1-2°C by 2050-2070 (up to 4°C by the end of the 21st century), more erratic precipitation distribution with longer dry spells and more intense rainfall events, which will considerably increase flooding risk in low-lying areas and water stress during dry periods [29].

It is clear that without accelerated adaptation investments into MHEWS, loss and damage will continue to increase, disproportionately affecting the most vulnerable populations in Central America (high confidence) [5].

Initial Gender Analysis (see Annex 4)

A preliminary gender analysis for Costa Rica and Panama has been performed and highlights that, despite strong normative and institutional frameworks supporting gender equality, significant structural gaps persist in economic participation, unpaid care burdens, access to resources, and exposure to gender-based violence. Women, particularly in rural, indigenous and low-income communities, play a central role in water management, household resource allocation and community resilience, yet face constraints in formal employment, STEM representation, decision-making spaces and access to climate and hydrometeorological information. Men, while more represented in technical and leadership roles, are often less engaged in care responsibilities and community-based resource management, reflecting entrenched gender norms. Evolving gender dynamics, such as higher educational attainment among young women, emerging leadership in public life, and growing institutional commitments to gender mainstreaming, offer a strategic opportunity for meaningful change. According to the Global Gender Gap Index, Costa Rica ranked 14th globally in 2023 (score: 0.793) and 19th in 2024 (score: 0.785), placing it consistently among the top performers in Latin America; Panama ranked 58th in 2023 and 50th in 2024 (score: 0.742), reflecting mixed progress. In Costa Rica, women's employment rate (47%) remains 26 percentage points below that of men (73%), and women spend approximately 23 more hours per week on unpaid domestic and care work than men (OECD, 2024), a structural constraint that directly limits their participation in technical roles, community-level decision-making, and access to hydrometeorological information relevant to this project.

Current situation

With the support of WMO and the Inter-American Development Bank (IDB), and in close collaboration with NMHS and sectoral users of information at the national level, a detailed national assessment of the hydrometeorological value chain was carried out in both countries in 2021 and 2022.

As a result of these exercises, structural problems related to the generation, provision and use of hydrometeorological products and services were identified. Likewise, a set of strategic actions aimed at strengthening the critical components of this value chain was defined. These actions were systematized and articulated in a roadmap that establishes the guidelines for their progressive implementation.

The results obtained from the diagnosis and evaluation developed in close coordination with the respective national institutions in Costa Rica and Panama, provided fundamental inputs to define the strategic orientation of the roadmap, identify areas of opportunity, and establish the specific needs associated with the priority issues for the strengthening of the hydrometeorological value chain in each country.

Key findings⁶

For Costa Rica:

- The National Meteorological Institute (IMN) and the Costa Rican Institute of Electricity (ICE) are the central technical bodies in meteorology and hydrology, respectively, at the national level. The IMN is the national authority responsible for meteorological services, including the development and dissemination of early warning systems for communities. Both agencies face budget constraints that limit their operations and capacity for expansion. However, they have highly qualified personnel and installed technical capacities that are strategic for addressing the country's needs in these areas.

⁶ For additional information, please refer to a more detailed [summary of the roadmaps](#).

- The analysis of the current legal frameworks showed the absence of an entity with an explicit mandate to exercise the function of national authority in hydrological matters. Various institutions have partial or implicit competences in the subject but limited to their specific sectoral areas. The entities represented in the National Committee of Hydrology and Meteorology (CONAHYME) recognize the technical capacity of the ICE and have expressed their willingness for this institution to formally assume the hydrological functions at the national level. For its part, although the IMN has expressed interest in strengthening its capacities in hydrology, the focus within this project is on hydrology as it relates to early warning systems rather than on sector-specific operational hydrology. While IMN may not assume full operational hydrology functions in the short or medium term, it requires systematic and timely access to hydrological data and products to effectively fulfil its mandate in issuing early warnings.
- CONAHYME is recognized as a relevant inter-institutional coordination mechanism in the hydrological and meteorological fields. However, its scope is limited by its purely advisory nature, since its resolutions are not binding.
- There are no effective institutional mechanisms to articulate and optimize the technical capacities installed in each entity to respond in an integrated manner to the country's hydrometeorological needs. Likewise, the absence of a national regulatory framework that promotes cooperation, exchange of information and interoperability among the actors involved in the hydrometeorological value chain, as well as the efficient use of the products and services generated, is identified.

For Panama:

- The creation of the Institute of Meteorology and Hydrology of Panama, Engineer Ovigildo Herrera Marcucci (IMHPA), in April 2021, represents a fundamental strategic milestone for the strengthening of the hydrometeorological value chain in the country. However, challenges remain for consolidation of the operational, normative, and organizational elements necessary for proper implementation and institutional development.
- The Law that establishes the creation of the IMHPA defines specific responsibilities and deadlines for its compliance, so its implementation should be a priority in the short term.
- The National Water Security Plan (PNSH) 2015–2050 establishes a close link between its programs, lines of action and investments, and the availability of reliable and timely hydrometeorological data, information and products. In accordance with the legal framework in force in Panama, compliance with the PNSH is mandatory, which reinforces the mandate of the IMHPA in terms of the generation, management and provision of hydrometeorological information that supports decision-making in all strategic sectors of the country.

To have these valuable planning instruments, together with the recently created Institute of Meteorology and Hydrology of Panama (IMHPA) and two consolidated and recognized institutions not only in Costa Rica but in Central America (National Meteorological Institute of Costa Rica (IMN) and the Costa Rican Institute of Electricity (ICE)), as well as the recent change of government administrations in both countries, it opens a window of opportunity for the joint development and implementation of capacity-building initiatives to strengthen the provision of hydrometeorological services, particularly linked to droughts and floods. The existence and willingness of the Regional Committee on Water Resources (CRRH) of the Central American Integration System (SICA) to support and facilitate not only the implementation, but also to contribute to the integration and extension of national benefits and results at the regional level throughout Central America represents an additional added value. In addition, WMO and its partners, such as the Global Water Partnership (GWP), also bring added value to enhancing capacities around hydrometeorology and water resources management through the different technical outputs, methodologies, standardizations,

knowledge-management platforms, networks of experts and results of their associated drought and flood management programmes.

Project/Programme Objectives:

The objective of the project is to improve climate change adaptation capacity and resilience to droughts and floods in Costa Rica and Panama through the strengthening of hydroclimatic⁷ and early warning systems (EWS) and the integration of the knowledge generated in the planning and management of national and regional water resources, according to the pillars of EWS risk management. This will be achieved by:

- (1) Strengthening monitoring capabilities of meteorological, hydrological and climatic variables through the improvement of monitoring and data systems that allow the collection, interoperability, exchange and integration of data at the regional and national level;
- (2) Strengthening forecasting capacities of meteorological, hydrological and climatic hazards through the improvement of knowledge generation and informed decision-making at the regional and national levels, based on a solid monitoring network strengthened in Component I;
- (3) Establishing a Regional Flood and Drought Management Virtual Centre within the CRRH to strengthen regional coordination of flood and drought management, and improve risk knowledge and multi-hazard early warning capacities at regional, national and local scales, focusing on vulnerable people through pilot activities, and ensuring that National Drought and Flood Plans are developed and implemented;
- (4) Improving hydroclimatic governance, including institutional capacity and stakeholder awareness for the strengthening of integrated drought and flood management at the regional (through the CRRH), national (through the NMHS of Costa Rica and Panama) and local (through the pilot activities in priority basins), helping decision-making processes at the three scales, ensuring better inclusive policy tools and the training needed to sustain long-term activities.

Through these four interlinking components, implemented through an integrated approach at the local, national, binational and regional levels, this initiative will strengthen institutional arrangements and tools at different scales. It will also enable the generation and provision of, as well as access to, services, information and accurate and timely data according to the general needs of the population and particular needs of end users at the institutional level and in priority communities - specifically related to drought and flood management. This integrated approach has been designed to be cost-effective by leveraging economies of scale in joint implementation, strengthening institutional coordination, and optimizing the use of existing resources and procedures at the national level.

To illustrate of the interrelations between the current situation and gaps, and how the project will address those, Fig. 3 presents the Theory of Change of the project.

⁷ The terms "hydroclimatic", "climatic" and "hydrometeorological" are used interchangeably in this document when referring to data, products and services that support risk management and adaptation to climate change. This decision responds to a practical and technical need to efficiently communicate the integrated and complementary nature of these systems of observation and analysis, whose conceptual boundaries often overlap in practice. As the project comprehensively addresses the generation, use and articulation of data and services in the three domains – climate, water and (meteorological) weather – for decision-making, planning and early warning, the terminological flexibility allows to reflect the interdependent nature of the technical components of the project.

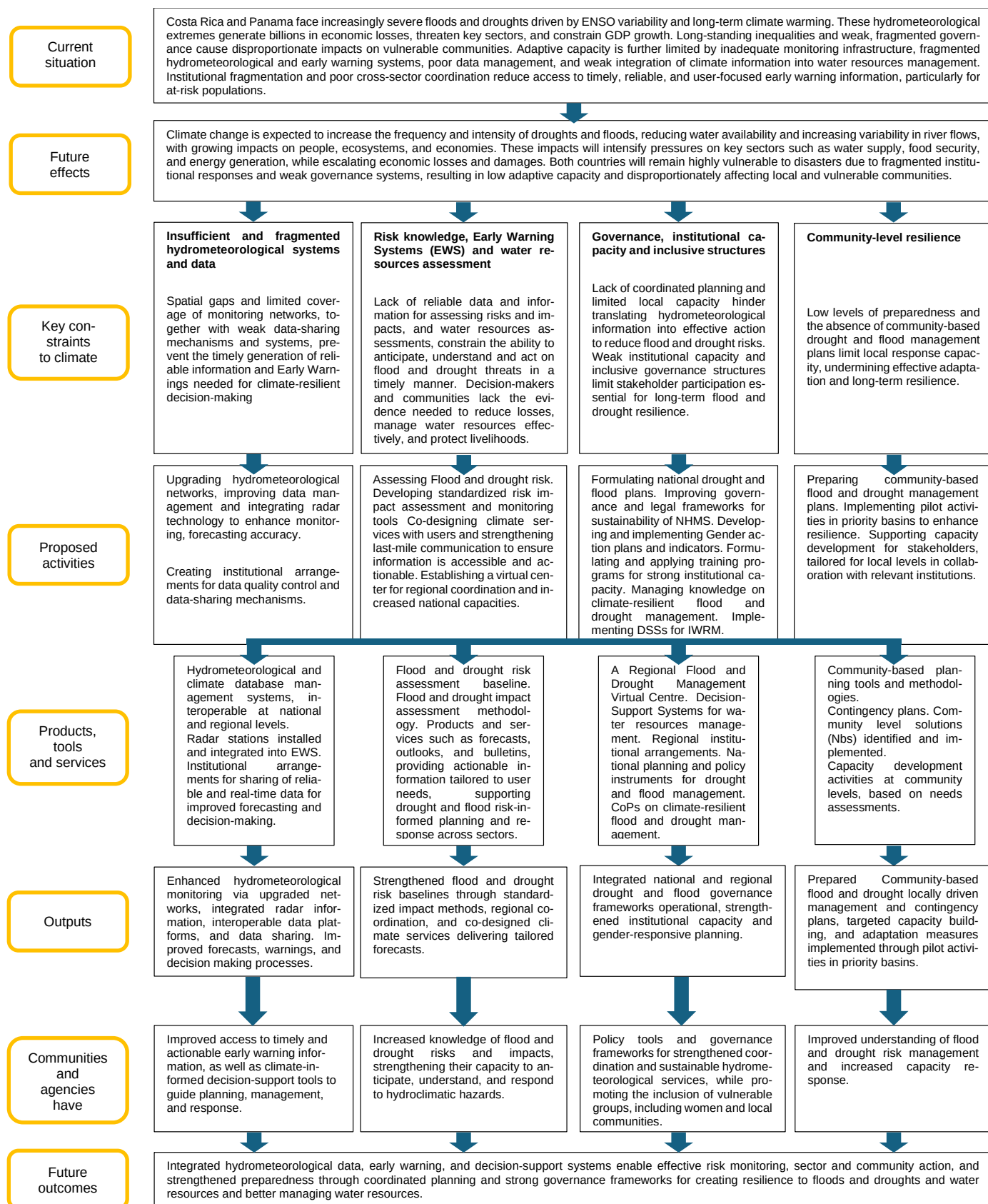


Fig. 3. Theory of Change

Project/Programme Components and Financing:

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (US\$)
1. Hydrometeorological observing, monitoring, and data management infrastructure improved for risk awareness and Early Warnings	1.1 Integrated observation, monitoring and data management systems provide inputs for risk knowledge and Early Warning	1.1.1 Modernized and integrated hydrometeorological monitoring networks in priority basins at national and regional levels to ensure long-term functionality and sustainability.	Costa Rica and Panama	1,640,000
		1.1.2 Meteorological, hydrological and climate database management systems consolidated, strengthened and made interoperable at national and regional levels.	Costa Rica and, Panama	1,660,000
		1.1.3 Radar stations installed, and data generated are integrated into national and regional monitoring networks to refine early warning products	Costa Rica and, Panama	4,050,000
	1.2 Hydrometeorological and climate data at national and regional scales available for product and service generation	1.2.1 Hydrometeorological and climate data and information integrated into national and regional databases	Costa Rica and, Panama	116,000
		1.2.2 Institutional arrangements established to integrate, process and disseminate data at national and regional levels according to end-user needs at public and sectoral levels	Costa Rica and, Panama	1,400,000
2. Institutional set-up and processes for risk knowledge and Early Warning	2.1 Enhanced and sustained mechanisms for flood and drought risk knowledge for use by communities and users	2.1.1 Baseline flood and drought risk assessment undertaken in the priority basins and mechanisms established to conduct these assessments periodically	Costa Rica and Panama	330,000
		2.1.2 Flood and drought impact monitoring methodology including non-traditional data sources and pilot crowdsourcing mechanisms established and integrated into databases on national and regional level	Costa Rica and Panama	300,000
		2.1.3 Mechanism established to assess benefit of hydrometeorological information and cost of its absence based on SEB	Costa Rica and Panama	240,000
	2.2 Enhanced and sustained hydrometeorological forecasting available to communities, sectors and users	2.2.1 Products and services defined and developed in a participatory manner with communities and end-users, both at the basin level (for floods) and at the national/basin level (for droughts)	Costa Rica and Panama	620,000
		2.2.2 Products on hydrological status and outlooks (sub-seasonal to seasonal) for priority basins generated in accordance with international guidelines and end-user needs at sectoral and communities level	Costa Rica and Panama	1,000,000
	2.3 Dissemination of flood and drought alerts available to communities and users	2.3.1 Last-mile-focused warning communication and dissemination structures established and implemented, including the co-production and regular dissemination of drought bulletins for sectoral ministries, and linked to local and national drought and flood contingency plans and official declaration mechanisms.	Costa Rica and Panama	2,000,000
3. Flood and drought management and risk mitigation enhancement	3.1 Strengthened regional coordination of flood and drought management and policy	3.1.1 Regional Flood and Drought Management Virtual Centre established at CENTROCLIMA with the support of NMHSs, managing and providing harmonized risk knowledge, data and information, as well as developing national capacity	Costa Rica and Panama	1,160,000

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (US\$)
from regional to local level and viceversa		3.1.2 Regional institutional arrangements and working groups established under the Regional Flood and Drought Management Virtual Centre	Costa Rica and Panama	70,000
	3.2 Users make decisions based on established national planning for flood and drought and response capacity for communities is strengthened	3.2.1 National drought plans established and/or supported for implementation, under an inclusive approach	Costa Rica and Panama	180,000
		3.2.2 National flood plans established, under an inclusive approach	Costa Rica and Panama	170,000
		3.2.3 A decision support system for integrated water management implemented at the national scale	Costa Rica and Panama	240,000
	3.3 Vulnerable communities more resilient against flood and drought	3.3.1 Community flood management plans in place, including contingency plans, in vulnerable communities	Costa Rica and Panama	100,000
		3.3.2 Community-based climate-resilient drought risk management plans established for vulnerable communities	Costa Rica and Panama	100,000
		3.3.3 Pilot activities in priority basins implemented to reduce the risk of drought and floods in the most vulnerable communities, prioritizing nature-based solutions	Costa Rica and Panama	1,600,000
4. Enabling environment for building resilience to floods and droughts	4.1 Enhanced governance framework and gender mainstreaming for integrated drought and flood management	4.1.1 Framework for the sustainability of hydrometeorological services integrated into national legal and planning instruments, including ministerial decrees and private sector participation and engagement	Costa Rica and Panama	200,000
		4.1.2 Policy and governance mechanisms and instruments to strengthen institutional capacity and coordination are integrated at all stages of the hydrometeorological chain	Costa Rica and Panama	100,000
		4.1.3 Gender action plans, indicators and training developed and implemented	Costa Rica and Panama	100,000
	4.2 Enhanced institutional capacity and stakeholders' awareness for integrated drought and flood management	4.2.1 Comprehensive training and education programme for stakeholders designed based on a capacity needs assessment and implemented at regional, national and local levels in collaboration with relevant institutions to promote long-term sustainability.	Costa Rica and Panama	1,280,000
		4.2.2 Knowledge management and community of practice on climate-resilient flood and drought management established	Costa Rica and, Panama	300,000
6. Project/Programme Execution cost				1,825,050
7. Total Project/Programme Cost				20,781,050
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)				2,078,105
Amount of Financing Requested				22,859,155

Projected calendar	Milestones	Expected Dates
	Start of Project/Programme Implementation	01-2027
	Mid-term Review (if planned)	07-2029
	Project/Programme Closing	01-2031
	Final Evaluation	03-2031

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project/programme components, particularly focusing on the concrete adaptation activities, how these activities would contribute to climate resilience, and how they would build added value through the regional approach, compared to implementing similar activities in each country individually.

This project is structured in relation to the pillars of EWS risk management, taking into account the main obstacles encountered in previously-integrated strategic roadmaps (as explained in the key findings of the current situation under the section “Project/Programme Background and Context”):

- a) insufficient hydrometric data coverage and collection, including the need for data exchange at an appropriate scale for the effective delivery of hydrometric services;
- b) limited governance and lack of an enabling environment for institutional effectiveness, including multisectoral coordination and exchange of data and information;
- c) limited government funding and budgets;
- d) insufficient hydrometeorological information for sustainable sectoral planning, development and management, and in particular of the water sector and hydrometeorological extremes (droughts and floods), as well as early warning; and
- e) insufficient institutional support for regional hydrometeorological operations, caused by deficiencies and lack of regional tools, methodologies and products.

The project will focus on three geographical scales: regional, national and priority river basins. At the regional level, the work will be integrated under the framework of the CRRH and this institution will be both in charge of providing regional products and the main support for NMHSS in technical, systematization and training terms, and in institutionalizing generated products. At the national level, NMHSS (i.e., IMN and ICE in Costa Rica and IMHPA in Panama) will be strengthened to modernize and expand their observing infrastructure and to be able to provide timely and quality data, information, and services in line with the needs and priorities established in the national context, they will also be the coordinators with other national institutions of efforts at the national level. At the level of priority basins identified by national institutions as areas for pilot activities implementation, activities will be carried out in the following basins (see Annex 1 for information on their selection):

- Costa Rica: Tempisque River Basin and Pirris–Parrita–Candelaria River Basin
- Panama: La Villa River Basin and Tonosí River Basin
- Transboundary: Sixaola Basin

In this sense, the project is made up of 4 components: 3 complementary technical components and a transversal component (see Fig. 4).



Fig. 4. Project components.

While Component I provides the technical foundation: data, monitoring, and infrastructure, Component II converts that foundation into risk knowledge, forecasts, and warnings through institutional processes. From there,

Component III uses those products to drive management, planning, decision-making and community resilience from regional to local level and vice versa. Finally, Component IV underpins all others by locking in sustainability through governance, financing, capacity-building, knowledge management and gender mainstreaming. Each component is explained below:

Component I: Hydrometeorological observing, monitoring, and data management infrastructure improved for risk awareness and Early Warnings.

This component will strengthen integrated hydrometeorological observation, monitoring and data management systems to enhance risk knowledge and early warning for climate-related hazards, particularly floods and droughts, at national and regional scales. It will modernize and expand hydrometeorological monitoring networks in priority basins, including the deployment of new stations, use of innovative technologies for streamflow monitoring, integration of citizen science where quality can be assured, and the development and implementation of sustainable operation and maintenance strategies with complementary financing mechanisms. Meteorological radar capacity will be expanded and integrated into national and regional mosaics to improve real-time detection and short-term forecasting of high-impact events, with data shared through established regional platforms. In parallel, an interoperable hydrometeorological and climate Database Management System (DBMS) will be implemented in the NMHSS, CRRH and selected user institutions⁸, supported by appropriate hardware, software, data rescue and digitization, and standardized quality control in line with WMO standards. Institutional arrangements and governance mechanisms will ensure timely data integration, processing and dissemination according to end-user needs, enabling the sustained availability of high-quality historical and real-time data for the generation of early warning products and climate services that support decision-making by vulnerable communities and key sectoral stakeholders.

Fig. 5**Error! Reference source not found.** shows schematically how the communication between the different parties involved in the management of the DBMS would be, using MCH and WHOS⁹ as main data management system and data exchange mechanism respectively.

The development of an O&M strategy is a critical aspect of this component, to ensure sustainability targeting both the institutional and personnel aspects, as well as the identification and implementation of effective financing mechanisms complementary to the fluctuating budgets of government institutions (such strategy will be used as input to the activities of Component IV).

Consideration of data and information needs will be placed for the activities in vulnerable communities of the selected basins (expected output 3.3). In the case of Costa Rica, since a World Bank project¹⁰ plans to strengthen their hydrological network, recommendations for the location of stations will be coordinated.

⁸ In Panama, IMHPA, the Ministry of Environment, the National Civil Protection System (SINAPROC) and the Ministry of Agricultural Development (MIDA) will be direct beneficiaries of this project output, using a more robust database for their early warning tasks. In Costa Rica, the integration of data in open-source formats will strengthen the current operational capacities of Costa Rican specialized institutions (IMN, ICE and DA) in coordination with the National Emergency Commission (CNE) and the National Technical Commission of the ENSO Phenomenon (COENOS) for the timely attention of droughts and floods. The stored data will be standardized according to WMO specifications and linked to the international context, including observational data products, climate change indices, drought indices, among others. Governance policies are adopted to ensure compliance with regulations related to hydroclimatic data management and information technology governance, which requires a seamless integration of people, processes, and technologies that are constantly updated.

⁹ MCH system (Meteorological, Climate and Hydrological Database Management System); WIS-WHOS (WMO Hydrological Observing System, within the framework of the WMO Information System),

¹⁰ Program for the development of resilient infrastructure and territorial development: This program will be financed by the WB and executed by the CNE of Costa Rica. Its objective is to increase access to disaster-resilient infrastructure with an emphasis on the intervention of territories with vulnerable populations, particularly people in conditions of poverty and social exclusion. About 15,000,000 USD are considered for the hydrological area.

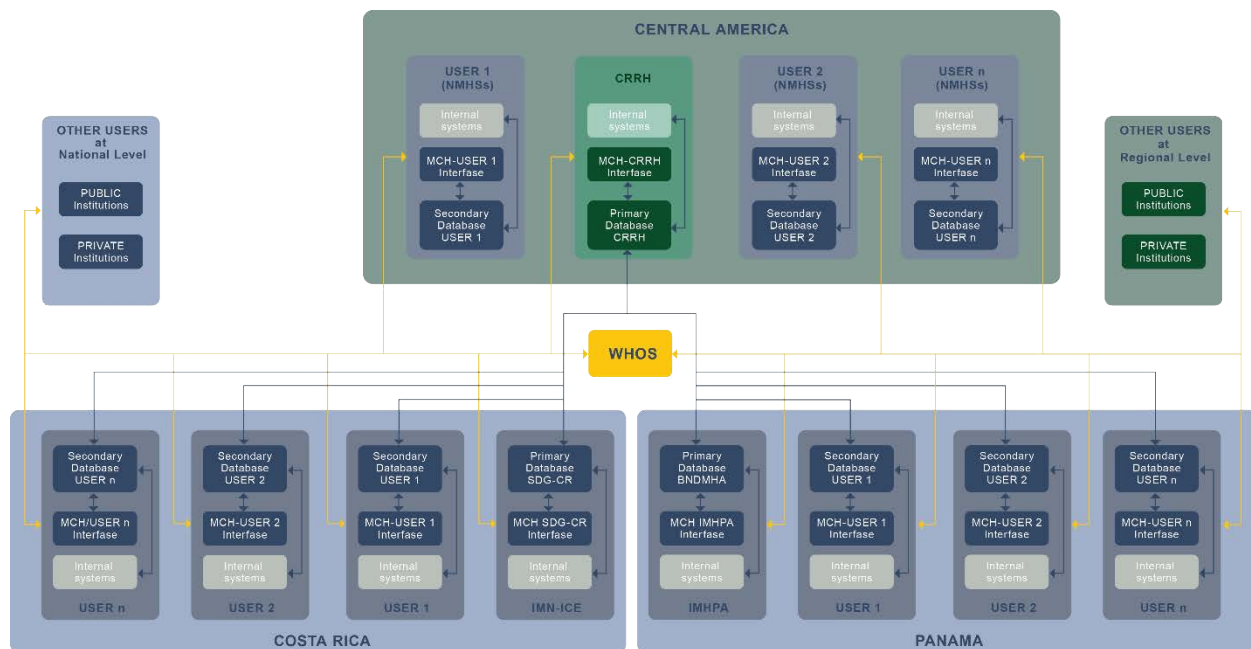


Fig. 5. Intercommunication scheme of the DBMS.

Component II: Institutional set-up and processes for risk knowledge and Early Warning.

This component strengthens institutional capacities, coordination mechanisms and operational processes required to generate, use and communicate flood and drought risk information and early warnings at community, national and regional levels. It will establish and operationalize standardized mechanisms for flood and drought risk assessment, impact monitoring and periodic updates in priority basins and at national scale, integrating traditional and non-traditional data sources and aligning with national regulations, regional frameworks and international best practices. The component will support the development of participatory, impact-based hydrometeorological and climate forecasting methodologies and tailored products, including hydrological status and outlooks from sub-seasonal to seasonal timescales, co-designed with sectoral users, civil protection agencies and vulnerable communities. Institutional arrangements will be reinforced among NMHSS, risk management authorities, CRRH, CEPREDENAC and other sectoral institutions to enable interoperable data sharing, analysis and dissemination, including assessment of the socioeconomic benefits of hydrometeorological services to inform policy, investment and sustainability. Finally, the component will establish last-mile-focused early warning communication and dissemination structures, linked to contingency plans and emergency protocols, and deliver clear thresholds, alerts, bulletins, dashboards and communication materials, ensuring timely, understandable and actionable flood and drought warnings that support preparedness, response and resilience-building in the most vulnerable areas.

A SEB analysis of the use of hydrometeorological information in general, as well as on the different products and services that would be generated in a Regional Centre for Flood and Drought Management (CRGIS) (under Component III), will be of vital importance to generate awareness on the value of such information and to support efforts in relation to the allocation of budgets and financing that allow the adequate O&M of NMHSS and specifically of the CRGIS.

Through the project, EWS for floods and droughts will be proposed or improved, integrating timely and reliable data for decision-making into their services, for the benefit of the most vulnerable communities in the selected priority basins. This system will integrate the 6 principles of adaptation to build climate resilience, as follows:

- 1) Ensure resilience through inclusive development;
- 2) Facilitate the adaptation of people;
- 3) Adapt land use and protect critical public goods and services;
- 4) Enhancing people's capacity to cope with and recover from crises;
- 5) Anticipate and manage macroeconomic and fiscal risks;
- 6) Ensure effective implementation through prioritization and continuous monitoring.

The activities of this Outcome will seek to strengthen the current operational capacities of specialized institutions, NMHSs in coordination with risk management agencies, as well as the creation of products such as water bulletins and drought monitoring, reinforcing the stages of drought effects (meteorological, hydrological, and socio-economic) of existing climate bulletins.

Component III: Flood and drought management and risk mitigation enhancement from regional to local level.

This component strengthens flood and drought management and risk mitigation from regional to community level by reinforcing coordination mechanisms, national planning and local resilience, anchored in the establishment of a Regional Flood and Drought Management Virtual Centre within CRRH's CENTROCLIMA platform. CRGIS will serve as a sustainable regional hub to harmonize risk knowledge, data, tools and methodologies, strengthen the technical capacity of NMHSs, and support coordinated policy dialogue through regional and binational working groups. The component will support the development, updating and implementation of inclusive national and binational drought and flood plans in Costa Rica and Panama, with particular attention to transboundary basins, aligned with WMO, UNDRR, UNCCD and other international best practices and focused on long-term integrated risk management. Decision-support systems for integrated water resources management will be operationalized at national level, linking hydrometeorological information and forecasts to planning and response processes through established platforms and recurrent hydrological and climate forums. At community level, participatory flood and drought management plans will be developed in priority basins, incorporating gender, intercultural¹¹, intergenerational¹², indigenous, Afro-descendant and disability perspectives, and emphasizing nature-based solutions. These plans will be translated into on-the-ground pilot interventions that strengthen local governance, preparedness and adaptive capacity, ensuring that vulnerable communities can effectively anticipate, manage and reduce flood and drought risks while benefiting from the regional-to-local flow of information, services and early warning generated under the project.

Under this component, Decision Support Systems (DSSs) will be developed or improved and will have a national approach considering the integrated water resources management strategy. Possible examples of initiatives to interact with such DSSs include the IDB's HydroBID and the WMO HydroSOS, for water availability and hydrological status and outlooks respectively. Likewise, the dissemination of information and the sharing of knowledge about these phenomena are also tasks contemplated through the realization and legal formalization of the Hydrological and Climate Forums at least twice a year at the transboundary, national and local levels.

Moreover, pilot activities in priority basins will seek to strengthen local governance structures, and take advantage of information, data, institutional arrangements, infrastructure, methodologies, protocols, products and services, and trainings generated under the other components of the project.

Concrete interventions include the deployment of community-level early warning infrastructure, real-time hydrological monitoring equipment, and localized contingency plans that directly insulate vulnerable agricultural sectors and rural municipalities from immediate flood and drought shocks.

¹¹ Interculturality is the social phenomenon in which two or more cultures relate to each other on equal terms, without any one point of view predominating over the others. This type of relationship favors dialogue, understanding, integration and the enrichment of cultures.

¹² Intergenerationality refers to the relationships and interaction between people of different generations within a society. It is a concept that highlights the importance of coexistence, the exchange of knowledge and experiences, and solidarity between young and old.

Component IV: Enabling environment for building resilience to floods and droughts

This component strengthens the enabling environment required to sustain climate-resilient flood and drought management beyond the lifetime of the project by reinforcing governance frameworks, institutional capacities, stakeholder awareness and gender mainstreaming, while securing national financial and institutional support for hydrometeorological services. It will support the integration of hydrometeorological monitoring, early warning and climate services into national legal, regulatory and planning instruments through institutional assessments, formalized coordination mechanisms, and engagement with the private sector, ensuring that operation, maintenance and financing of these systems are nationally anchored rather than donor-dependent. Policy and governance instruments will be strengthened across the hydrometeorological value chain to enhance inter-institutional coordination and consistent use of climate information for decision-making. The component will also develop and implement gender action plans, indicators and targeted training to ensure that flood and drought management services are inclusive and responsive to the differentiated roles, needs and capacities of women and men and of vulnerable groups. In parallel, comprehensive capacity-building, training and awareness programmes will be delivered at regional, national and local levels, embedding technical skills and knowledge among information providers, sectoral users and communities. A structured knowledge management system and community of practice will be established to capture, share and institutionalize good practices, lessons learned and technical products, reinforcing long-term learning, collaboration and ownership. Together, these actions will create the institutional, financial and social conditions necessary to sustain integrated flood and drought management and to ensure that resilience gains achieved under the project are maintained and scaled over time.

For the development of the community of practice, it is proposed to make use of the platform that GWP has developed, including its link with CENTROCLIMA. All the knowledge products generated through the project can be hosted on this platform, including case studies, technical notes, training materials. In the same way, a community of practice will be designed according to the needs of the beneficiaries of the project, which will be hosted on the aforementioned virtual platform. Detailed information about knowledge management is available in section H.

Tab. 1. Table of planned activities.

Project Components	Expected Outcomes	Expected Outputs	Planned activities
1. Hydro-meteorological observing, monitoring, and data management infrastructure improved for risk awareness and Early Warnings	1.1 Integrated observation, monitoring and data management systems provide inputs for risk knowledge and Early Warning	1.1.1 Modernized and integrated hydrometeorological monitoring networks in priority basins at national and regional levels to ensure long-term functionality and sustainability.	1.1.1.1 Conduct comprehensive network redesign studies encompassing modernization and expansion plans for the national reference network, including technical equipment specifications, project-specific network design, and operation and maintenance plan and protocols
			1.1.1.2 Deploy and instrument hydrometeorological observation networks in the 5 pilot basins (4 stations per basin)
			1.1.1.3 Formulate an operation and maintenance (O&M) strategy for monitoring networks incorporating sustainable financing mechanisms
			1.1.1.4 Execute the O&M strategy over a four-year period, including equipment calibration services and procurement of spare parts and tools
		1.1.2 Meteorological, hydrological and climate database management systems consolidated, strengthened and made interoperable at national and regional levels.	1.1.2.1 Conduct a diagnostic assessment of data and information needs and current capacities of institutional users at national and priority basin scales
			1.1.2.2 Implement hydrometeorological and climate database management systems (DBMS) in both the National Hydrometeorological Services (NMHS) and CRRH, as well as complementary developments required using available platforms in the WMO context (MCH, WIS-WHOS)
			1.1.2.3 Procurement of computer equipment for DBMS implementation at national and regional scales (information producers: NMHS and CRRH)
		1.1.3 Radar stations installed, and data generated are integrated into national and regional monitoring networks to refine early warning products	1.1.3.1 Conduct a diagnostic study on the feasibility and sustainability of radar installation
			1.1.3.2 Procure and install meteorological radars according to the results of the diagnostic in 1.1.3.1
			1.1.3.3 Integration of radars into national and regional mosaics for improvement of flood early warning products
	1.2 Hydrometeorological and climate data at national and regional scales available for product and service generation	1.2.1 Hydrometeorological and climate data and information integrated into national and regional databases	1.2.1.1 Compile and process (including rescue and digitization) datasets for integration and analysis
			1.2.1.2 Develop and implement a data quality control system (including homogenization) for all hydrometeorological and other available data series in an integrated manner
		1.2.1 Hydrometeorological and climate data and information integrated into national and regional databases	1.2.2.1 Implement hydrometeorological and climate DBMS at selected user institutions and develop complementary modules in accordance with their needs
			1.2.2.2 Procurement of computer equipment for DBMS implementation at national and regional scales in selected user institutions
2. Institutional set-up and processes for risk knowledge and Early Warning	2.1 Enhanced and sustained mechanisms for flood and drought risk knowledge for use by communities and users	2.1.1 Baseline flood and drought risk assessment undertaken in the priority basins and mechanisms established to conduct this assessments periodically	2.1.1.1 Develop and establish consensus on a standardized methodology for flood and drought risk assessment, aligned with national regulatory frameworks and international best practices
			2.1.1.2 Conduct baseline risk assessments for priority basins (flood risk) and at national scale (drought risk), with periodic updates through implementation year 5
			2.1.1.3 Establish a standardized mechanism and institutional capacity to conduct periodic flood and drought risk assessments, aligned with national regulatory frameworks and international best practices, to inform policy and decision-making.
			2.1.1.4 Design and execute a targeted communication and outreach campaign to disseminate flood and drought risk assessment findings
		2.1.2 Flood and drought impact monitoring methodology including non-traditional data sources established and	2.1.2.1 Develop and establish consensus on a standardized methodology for assessing and monitoring flood and drought impacts
			2.1.2.2 Conduct comprehensive flood and drought impact assessments and establish a regional impact database for systematic information management

		integrated into databases on national and regional level	2.1.2.3 Develop a mechanism allowing farmers and other stakeholder to submit data on drought impacts to be analysed stored and made available through the database and feed into early warning
		2.1.3 Mechanism established to assess benefit of hydrometeorological information and cost of its absence based on SEB	2.1.3.1 Conduct a socioeconomic benefit (SEB) analysis to evaluate the value of products and services delivered by the Regional Flood and Drought Management Virtual Centre and assess dissemination programs at national and regional levels
			2.1.3.2 Design and execute a targeted communication and outreach campaign to disseminate socioeconomic benefit (SEB) analysis findings
			2.1.3.3 Establish and operationalize a continuous monitoring and evaluation mechanism to periodically assess the socioeconomic benefits of hydrometeorological services and the cost of inaction, generating regular evidence to inform policy, investment planning, and resource allocation
	2.2 Enhanced and sustained hydrometeorological forecasting available to communities and users	2.2.1 Products and services defined and developed in a participatory manner with communities and end-users, both at the basin level (for floods) and at the national/basin level (for droughts)	2.2.1.1 Develop and implement tailored methodologies for drought and flood monitoring and impact-based forecasting at national, binational, and regional scales
			2.2.1.2 Diagnose, develop, and implement necessary climate services and products, with special attention to floods and droughts
		2.2.1 Products and services defined and developed in a participatory manner with communities and end-users, both at the basin level (for floods) and at the national/basin level (for droughts)	2.2.2.1 Develop and deploy a collaborative Geographic Information System (GIS) and integrated database, accessible through CRRH's web platform, to disseminate real-time hydrological status information for selected basins
			2.2.2.2 Develop hydrological status and outlook products for priority basins and at national scale
			2.2.2.3 Conduct analysis of climate status and outlook products with respect to hydrological products
	2.3 Dissemination of flood and drought alerts available to communities and users	2.3.1 Last-mile-focused warning communication and dissemination structures established and implemented, including the co-production and regular dissemination of drought bulletins for sectoral ministries, and linked to local and national drought and flood contingency plans and official declaration mechanisms.	2.3.1.1 Prepare flood and drought forecasting products for priority basins and at national scale, respectively
			2.3.1.2 Develop specific products derived from drought and flood monitoring (early warning protocols, alert thresholds, improved resolution of drought monitoring at local level, dissemination materials for floods and drought - by priority sector)
3. Flood and drought management and risk mitigation enhancement from regional to local level	3.1 Strengthened regional coordination of flood and drought management and policy	3.1.1 Regional Flood and Drought Management Virtual Centre established at CENTROCLIMA with the support of NMHSS, managing and providing harmonized risk knowledge, data and information, as well as developing national capacity	3.1.1.1 Strengthen regional installed capacity (personnel) at CRRH
			3.1.1.2 Procure computer equipment for operation of the Regional Flood and Drought Management Virtual Centre at CRRH (regional component)
			3.1.1.3 Develop and implement a protocol to ensure O&M of CRGIS with coordinated participation and assistance from countries

		3.1.2 Regional institutional arrangements and working groups established under the Regional Flood and Drought Management Virtual Centre	3.1.2.1 Establish binational and regional working groups, formulate their operational plans, and provide technical support for their initiation and ongoing operations
	3.2 Users make decisions based on established national planning for flood and drought and response capacity for communities is strengthened	3.2.1 National drought plans established and/or supported for implementation, under an inclusive approach	3.2.1.1 Develop / update, and support implementation of national drought plans through participatory processes in Costa Rica and Panama
			3.2.1.2 Integrate a regional (binational) drought plan with special attention to transboundary basins
		3.2.2 National flood plans established, under an inclusive approach	3.2.2.1 Develop national flood plans through participatory processes in Costa Rica and Panama
			3.2.2.2 Integrate a regional (binational) flood plan with special attention to transboundary basins
		3.2.3 A decision support system for integrated water management implemented at the national scale	3.2.3.1 Link HydroBid and HydroSOS in Costa Rica and Panama and disseminate the platform and results with national water agencies through an existing/improved DSS
			3.2.3.2 Strengthen hydrological and climate forums at national, transboundary, and local levels through legal establishment and implementation of biannual events
	3.3 Vulnerable communities more resilient against flood and drought	3.3.1 Community flood management plans in place, including contingency plans, in vulnerable communities	3.3.1.1 Develop comprehensive flood management plans at basin level through participatory processes, including roadmaps, specific action plans, and operational protocols in Costa Rica and Panama
		3.3.2 Community-based climate-resilient drought risk management plans established for vulnerable communities	3.3.2.1 Develop comprehensive drought management plans at basin level through participatory processes, including roadmaps, specific action plans, and operational protocols in Costa Rica and Panama
		3.3.3 Pilot activities in priority basins implemented to reduce the risk of drought and floods in the most vulnerable communities, prioritizing nature-based solutions	3.3.3.1 Implement drought and flood plans through local activities (leveraging elements from other components: institutional arrangements, infrastructure, methodologies, protocols, products and services, training)
4. Enabling environment for building resilience to floods and droughts	4.1 Enhanced governance framework and gender mainstreaming for integrated drought and flood management	4.1.1 Framework for the sustainability of hydrometeorological services integrated into national legal and planning instruments, including ministerial decrees and private sector participation and engagement	4.1.1.1 Conduct a comprehensive legal and institutional assessment to develop and implement a roadmap for integrating sustainability mechanisms into national legal frameworks, including ministerial decrees, presidential decrees, regulatory instruments and the engagement of the private sector
			4.1.1.2 Develop and formalize technical cooperation and inter-institutional coordination agreements
		4.1.2 Policy and governance mechanisms and instruments to strengthen institutional capacity and coordination are integrated at all stages of the hydrometeorological chain	4.1.2.1 Develop and formalize technical cooperation agreements and inter-institutional coordination protocols to establish operational frameworks and procedures
		4.1.3 Gender action plans, indicators and training developed and implemented	4.1.3.1 Develop and implement gender action plans

	4.2 Enhanced institutional capacity and stakeholders' awareness for integrated drought and flood management	4.2.1 Comprehensive training and education programme for stakeholders designed based on a capacity needs assessment and implemented at regional, national and local levels in collaboration with relevant institutions to promote long-term sustainability.	4.2.1.1 Design a comprehensive training and capacity-building program targeting all relevant stakeholders, incorporating thematic areas from across project components with particular emphasis on gender mainstreaming
			4.2.1.2 Implement a multi-modal training and capacity-building program utilizing diverse delivery mechanisms
			4.2.1.3 Develop and implement training of trainers programme to train farmers and other stakeholders on submitting drought impact data
		4.2.2 Knowledge management and community of practice on climate-resilient flood and drought management established	4.2.2.1 Formulate a comprehensive knowledge management strategy and action plan for climate-resilient flood and drought management practices
			4.2.2.2 Implement knowledge management activities and establish a community of practice to facilitate knowledge exchange and collaborative learning

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

Coordination and flow of information

The most important mechanism within the project and which brings innovation (because today is lacking) is the articulation between the regional, national and basin (local) geographical scales, adopting a "top-down/bottom-up" flow where the information from the different scales' feeds back in both directions. This ensures that information flows not only from the regional to the national to the local level, but that the local scale can transmit information that validates what is received from the national level, in addition to actively participating in the decision-making process and having direct access to feed back into national and regional forecasting systems. While the top-down approach provides strategic vision, guidance, and resources, the bottom-up approach ensures that solutions are inclusive, tailored to local needs and conditions.

In terms of regional coordination, once the project is completed, the results and experiences acquired can serve as an example to be replicated in other basins both in the participating countries and in other countries at the regional level, also cooperating with other regional partners.

Observations and data exchange

The project focuses on ensuring that the data and information necessary to generate products and services that will be used to protect the population and their property from droughts and floods, as well as to facilitate decision-making and national and basin-level planning processes. Currently, in both countries, data and information collection is carried out in a fragmented manner by different institutions, without complete integration or systematic exchange between institutions in the necessary times and formats. This prevents their proper use not only in the hydrometeorological field, but also in economic sectors that require them for the fulfilment of their mandate (such the Water Directorate in Costa Rica and the Water Security Directorate in Panama and the institutions linked to the agricultural sector, civil protection, water and sanitation sector, among others). The project seeks to solve this obstacle by creating a national database for each country, accessible to all institutions that require it.

The implementation of free and open-source technical solutions for the integration and use of hydrometeorological and climate data and information at the national and regional levels will allow the necessary data management infrastructure to be shared among all national institutions (in addition to NMHSs). This is an innovative approach as they save NMHSs expenses on database systems and interoperability. In addition, these systems are provided by the WMO and have been implemented in several countries, so there is already a community of practice that can be enriched with new members.

In addition, innovation comes with data for daily operations in emergency response and short-, medium- and long-term planning which is inexistent for facing droughts and floods in a preventive manner and with a EWS risk management vision.

Products and services

Work will be done on the design and implementation of products and services in accordance with the needs of communities vulnerable to droughts and floods in the priority basins, considering both the protection of their population and the prediction of phenomena within the framework of socioeconomic development. In addition, the necessary warning mechanisms and protocols will be ensured, as well as the development of capacities so that the dissemination of information from the regional and national level to the end user at the community level.

The project also promotes innovation at the national ("agroclimatic technical tables") and regional levels through the activities and applications of climate and hydrological forums (mechanism for the generation and regional transfer of knowledge associated with climate and water) with new products and services for regional

preventive and proactive care that benefits the entire region, transferring information and knowledge to the productive and social sectors of the communities in priority basins, national and regional.

Likewise, the creation and implementation of a virtual center based on the CENTROCLIMA platform of the CRRH for the management of droughts and floods is innovative technologically and operationally. This tool, based on satellite information interpreted and calibrated with data from land observations integrated at the Central American region, national and pilot basin levels, will lay the foundations for gradually extending the methodologies and capacity building to the rest of the countries within SICA.

Finally, it is worth highlighting as innovative the approach of work at the basin level (both national and transboundary) for the generation of drought and flood plans.

Sustainability

Another innovative aspect of the project is to support services from the aspect of governance and public policy. It will require the development of methodologies, standards, the generation and publication of mechanisms and public policy instruments for dealing with drought and floods, as well as governance and legal ones, including inter-institutional coordination and collaboration agreements at the national and regional levels, as well as the design and implementation of action and communication protocols. and knowledge management. This harmonization involves a diagnosis of the legislation and regulations in force in the two countries and adjustments for joint implementation in the transboundary basin and within the respective countries.

Social component

The institutions of the countries have asked that not only the gender perspective and youth be taken into consideration for the development of community activities, but also criteria of intergenerationality and interculturality, together with the considerations of indigenous, Afro-descendant and disabled minorities. These concepts are innovative to be taken into account in the context of adaptation as they promote harmonious coexistence between generations and between cultures, promoting community resilience and inclusiveness and creating dialogue and exchanges of information.

Experiences of partners

The replication and use of innovative elements that have been the result of calls for innovation by the WMO HydroHub initiative will be promoted. In particular, the winning project, RIVeR-LAC, of the [3rd HydroHub innovation call](#) financed by the IDB, will be applied (as feasible). RIVeR-LAC produced open-source software and best practice guidelines that enable wider adoption of Large-Scale Particle Image Velocimetry (LSPIV) across Latin America and worldwide. Using simple cameras or drones to capture surface flow images, LSPIV allows NHSs to estimate river velocities and discharges safely and cost-effectively, even at remote or hazardous sites. The step-by-step materials make it easy for countries to integrate this method into operational river monitoring, supporting improved flood management and water resource assessments.

RIVeR-LAC delivers open-access tools and guidance that are highly relevant for strengthening hydro-meteorological monitoring. The RIVeR software is an open-source, user-friendly platform that integrates advanced image-based hydrology techniques (LSPIV) with automated workflows, multilingual interfaces, and scalable architectures, enabling both technical experts and operational staff to generate reliable streamflow data without costly or intrusive equipment. Complementing this, RIVeR-LAC provides comprehensive best practice guidelines that offer step-by-step instructions for field deployment, data processing, and analysis, supported by visual aids and designed for ease of use across varying institutional capacities. Together, these tools promote standardized, cost-effective, and non-contact monitoring approaches—enhancing the ability to capture hydrological extremes such as floods and droughts, particularly in data-scarce basins—while fostering regional capacity building, technology transfer, and long-term sustainability through open-source collaboration and continuous improvement.

In addition, the implementation of innovative crowdsourcing approaches will be piloted, enabling community-based monitoring of drought impacts. Through the Integrated Drought Management Programme (IDMP), GWP has extensive experience supporting countries in establishing feedback mechanisms where farmers and other stakeholders can share information on drought impacts to inform decision-making. These approaches, that have been successfully applied, for example, under the [DroughtWatch East Europe initiative](#), will be applied in the project, allowing to integrate remote sensing data with local observations to strengthen drought monitoring and early warning systems.

Alignment with the results areas of the Adaptation Fund

This project directly contributes to the Adaptation Fund's goal of assisting developing countries particularly vulnerable to climate change adverse effects by implementing concrete adaptation measures in Costa Rica and Panama. The project aligns with multiple outcome indicators of the Fund's results framework as follows:

- Component I, the project will enhance hydrometeorological infrastructure and early warning systems, directly contributing to increased numbers of people using improved climate-related hazards and threat information.
- Component II strengthens institutional capacity to reduce climate-induced risks by establishing systematic risk assessment mechanisms, impact monitoring methodologies, and functional early warning systems, thereby addressing socioeconomic and environmental losses.
- Component III advances the protection and improved management of ecosystems and natural resources through nature-based solutions in pilot activities, while strengthening community resilience to climate variability and change.
- Component IV directly supports the adoption and enforcement of policies, strategies, and plans that integrate climate risk and resilience considerations by strengthening legal frameworks, developing national drought and flood plans, and establishing sustainable financing mechanisms for hydrometeorological services.

The project's community-level interventions and participatory planning processes (Components III and IV) introduce elements of social and institutional innovation by strengthening risk awareness, fostering co-production of adaptation solutions, and enhancing local ownership of climate responses. The pilot activities in priority basins, combined with robust knowledge management and a regional community of practice, serve as innovation platforms that test, refine and scale locally grounded adaptation solutions. These mechanisms facilitate the replication and transfer of effective practices across countries and basins.

By addressing the full adaptation value chain—from observation infrastructure to risk knowledge, early warning, institutional coordination and community action—the project not only strengthens climate resilience but also demonstrates integrated and scalable adaptation approaches that represent innovation in practice for the region.

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

The project includes a socio-economic analysis (Outcome 2.1 Output 2.1.3) and identification of reliable mechanisms (e.g. a framework for sustainability integrated into legal and planning instruments) to ensure political commitment and corresponding public funding for the provision of hydrometeorological and water resources information to support decision-making (Outcome 4.1). The analysis will be based on documentation and processes already in place at the country level. For example, for both countries, information is available through the DESINVENTAR platform. In Panama, there is a document on the Monitoring and Evaluation System for Loss

and Damage due to Extreme and Slow Progress Events (2023) that will serve to identify more granular costs and make use of the indicators that are already monitored there so that the project is consistent with national planning. The analysis will show in more detail the social, economic and environmental benefits at the regional, national and pilot basin levels and will take into account existing analyses at the national level as well as at the regional level (such as the case of the GWP-CAM document on benefits of action versus cost of inaction). At this stage, it is considered that the sum of all the parts of the project will bring the expected benefits. In the preparation phase of the full project note, the benefits for each component are considered.

The cascade of benefits is expected to derive from the following: by improving the meteorological monitoring network and strengthening its respective data management, it will be possible to access a better analysis and quantification of risks as well as the behavior of the hydrological cycle with respect to, above all, droughts and floods. This will result in better products for all sectors of the population that depend on hydrometeorological information. The availability of products will ensure that (1) sectors can make informed decisions regarding water resource management and (2) the population can be alerted in a timely and accurate manner regarding droughts and floods. Thus, it will increase the resilience of livelihoods and economic activities, promoting national development and growth and in particular of priority basins.

Based on the above, some benefits and corresponding figures are presented. All the figures expressed here will be refined at the project proposal stage to define the baseline at the beginning of the project.

Social benefits

From the social point of view, through the products and EWS generated by the project (especially components 1, 2 and 3), it is expected to have an impact on the improvement of the quality of life, the reduction of waterborne diseases, improve the risk management capacity at the community level, and improve the understanding of hydroclimatic information. Likewise, the project is expected to improve (especially through component 4) inclusion and equality, social integration, as well as empowerment in decision-making and increasing capacity for emergency management. All this in order to reduce marginalization and vulnerability and increase the resilience of the population and its water security.

In alignment with the Adaptation Fund's Gender Policy, the project intentionally engages women, indigenous groups, and marginalized smallholders in the design of local EWS protocols. Recognizing that hydroclimatic disasters disproportionately impact vulnerable demographics, community water committees will promote greater female representation in decision-making roles. Environmentally, the integration of ecosystem-based adaptation metrics into basin management plans will safeguard riverine biodiversity and sustain vital watershed ecosystem services during prolonged dry spells.

At the population level, the project is expected to have an impact on:

- 2,106,000 people benefited (918,000 in Costa Rica and 1,188,000 in Panama) with drought and flood management and contingency plans. Including those plans prepared in a participatory and inclusive way in vulnerable communities and with end users.
- 550,988 inhabitants in vulnerable communities who will have an early warning system, designed in an inclusive and participatory manner, with products and services according to their needs and with training to take advantage of them. Timely information for vulnerable communities for decision-making to mitigate impacts and plan for prevention & harm reduction.
- Of these amounts, in the next phase it will be defined (according to an analysis of heads of households, members of Basin Commissions, gender perspective, vulnerability, etc.) what percentage of the population will receive training, planning for flood and drought care, as well as information for timely decision-making. For example, the number of women, young people, the elderly, indigenous people, Afro-descendants and people with disabilities in the selected basins participating in the activities planned within the project will be defined. In this way, it will be possible to determine the strengthening of social inclusion and gender.

As a breakdown of the above data, the following is available at the national level:

- Drought: 936,000 affected inhabitants. Considering that in 2014 and 2019 approximately 8% and 12% of the population was affected by drought in Costa Rica and Panama respectively ([DESINVENTAR](#)), then it could be said that 408,000 inhabitants of 5.1 million inhabitants in Costa Rica and 528,000 inhabitants of 4.4 million inhabitants in Panama would benefit from the project interventions.
- Floods: 1,170,000 affected inhabitants. 10% of the population of Costa Rica (according to the CNE) and 15% of the population of Panama (according to SINAPROC) are in areas at risk of flooding. This means that 510,000 inhabitants in Costa Rica and 660,000 inhabitants in Panama can benefit from the project interventions.
- Sub-seasonal to seasonal hydrological forecast: more than 2,106,000 inhabitants. This figure will have to be more clearly defined in the next phase. At the moment it is considered that it benefits all the inhabitants who suffer from drought and floods but it is worth mentioning that, indirectly, it can benefit the entire population of Costa Rica and Panama thanks to the support to sectors such as hydroelectric, agriculture, navigation, other sectors of the population susceptible to impacts by floods and droughts.

For products in specific pilot basins, it is expected to reach a population of:

- Costa Rica:
 - o Tempisque River: 326,953 inhabitants approx.
 - o Pirris-Parrita River: 22,000 inhabitants approx.
 - o As of 2022 figures, according to Costa Rica's INEC, 25.6% of the total population (not from the basins) are under 17 years of age and 9.6% over 65 years of age
- Panama:
 - o La Villa River: 162,076 inhabitants in the districts that contain the basin (INEC, 2023).
 - 21% are older adults, 22% are under 18 years of age, 3% are indigenous, 26% are Afro-descendants and 6% are disabled people.
 - o Tonosí River: 8,959 inhabitants in the districts that contain the basin (INEC, 2023).
 - 24% are older adults, 21.5% are under 18 years of age, 5.5% are indigenous, 37.8% are Afro-descendants and 6% are disabled.
- Transboundary:
 - o Sixaola: 31,000 inhabitants approx (2016).

Institutional level:

- for NMHSSs, which will be able to strengthen their capacities and provide better products and services to their users
- for the other institutions involved (linked to the occurrence and impacts of extreme hydrometeorological and climatic phenomena), which will be able to improve their planning and development of services for their users, taking as inputs the products generated through this project.

From a gender perspective, by recognizing differentiated needs of men and women, capacities and knowledge systems, and by promoting equitable participation in hydrometeorological services, early warning systems and adaptation planning, the project can strengthen resilience outcomes while contributing to sustainable shifts in gender relations and shared decision-making in climate risk management.

Economic benefits

Having relevant information on climate and hydrology in general, and in particular on droughts and floods, will facilitate decision-making in the planning and more efficient management of water resources for various purposes, increasing the resilience of livelihoods and economic activities, promoting national development and growth and in particular of priority basins.

Some of the areas where economic benefits will be seen are:

- Disaster risk reduction: reduction of direct and indirect economic damage to the population and productive sectors, through timely and accessible early warnings, including vulnerable economic groups and sectors, such as subsistence agriculture and livestock.
 - o Direct: fewer hectares damaged, fewer heads of cattle killed, greater number of population with assured water, reduced number of sick people and less damage to infrastructure in general.
- Drinking water: better allocation of volumes for consumptive uses that allow for the adoption of adaptive practices and more effective use.

- **Public investment:** There will be an optimization of the national budget with respect to hydrometeorological phenomena, droughts and floods. With the planning and preventive measures based on the products and services generated in the project, they will result in a reduction in investment expenditure that will be reduced to preventive measures instead of corrective measures. As an example, in 2025, the government of Panama will allocate 10 million USD to address a water crisis in the La Villa River.
- **Agricultural, forestry and livestock production:** Almost 24000 ha of sugarcane are grown on the Tempisque River and about 25% of the national rice is produced. In addition, 78% of the water in the basin is used for irrigation and 17% for agro-industrial use (Water Department-MINAET). The project will provide timely scientific elements for the dates of planting, agricultural insurance, growth and sale of livestock or decision for the design, rehabilitation and construction (or reconstruction) of infrastructure.
- **Energy:** In Costa Rica, hydroelectric energy production was 8,412 GWh and represented 67% (ICE, 2025) of total energy. In 2024, Panama's hydroelectric power supply was 7,797 GWh and represented 60% (CND, 2025) of the total supply, but in certain months it can represent up to 86% of total energy. Taking into account an average cost of 0.07 USD per kWh, we have that the economic value of hydroelectric power production in both countries is 1,135 million USD. The products derived from the project will provide greater certainty of storing water safely in flood conditions and of having a more adequate operating policy under drought events.
- **Navigation:** In the specific case of the Panama Canal, in 2023, the Canal's direct contributions were of a magnitude of 3% of Panama's GDP (Panama Canal Authority, ACP).
- **Infrastructure:** An analysis of the infrastructure at risk in the pilot basins will be carried out.
- **Tourism:** Tourism in Costa Rica reached the figure of 5,400 million USD in 2024 (Costa Rican Tourism Institute, ICT). 50% of Costa Rica's total investment in tourism is made in the province of Guanacaste, where the Tempisque basin is located. This means that the value of tourism in the basin is around 2,700 million USD. In the case of Panama, the figure reaches 6,000 million USD in 2024 at the national level (Panama Tourism Authority, ATP).

Environmental benefits

Through the dissemination of timely drought, flood products and sub-seasonal and seasonal hydrological forecasting, it is expected to achieve a reduction in damage to protected natural areas, bodies of water and riverbeds, which translates into the protection of aquatic systems. Since drought is one of the principal drivers of soil degradation, by the timely identification of this phenomenon and support to NbS, the project directly contributes to the principles of Land Degradation Neutrality (LDN). The information will also help to define NbS to be included in the plans that are generated at the basin level and at the national level.

Emphasis will be placed on the care of environmental services such as: the mitigation of greenhouse gas emissions (fixation, reduction, sequestration, storage and absorption); the protection of biodiversity for its conservation and sustainable use, for the protection of ecosystems and ways of life; the protection of water for urban, rural or hydroelectric use; and for natural scenic beauty for tourism and scientific purposes. As an example, the payment per hectare of forest within payment plans for environmental services in Costa Rica is between 164 and 2,629 USD per hectare (National Forest Financing Fund, FONAFIFO). In the case of Panama, as an example, it is considered that 16.4 million USD per year derives from flows from the existing forest in the Panama Canal Basin.

Likewise, with planning in selected basins and water resource management, it is expected to better manage the environment and identify and value the environmental services derived from better management of water resources, including environmental flows. It will also be possible to prevent soil degradation and desertification, as well as even reduce forest fires.

Initial gender assessment (see Annex 4)

The project recognizes that gender differences significantly influence adaptive capacity to climate change, particularly in rural contexts and river basins where women and men have distinct roles in water and natural resource management, including related to the impacts of water-related hazards. Men tend to remain predominant in formal technical and basin-scale decision-making roles related to water management, early warning systems, and emergency response, while women (despite increasing participation in local water

organizations), are more consistently engaged in informal governance, community monitoring, care provision, and knowledge transmission at household and community levels.

In the case of Costa Rica, the National Action Plan on Gender Equality in Climate Action (MINAE et al 2023) identifies persistent gaps in access to climate information, participation in decision-making spaces, and risk management. Likewise, the documents “Affirmative Actions Toward Women in Emergency and Disaster Preparedness and Response (CNE et al 2022)” and “Recommendations for Incorporating the Gender Equality Approach in Emergency and Disaster Preparedness and Response (CNE et al 2022)” emphasize the need to strengthen women’s participation in emergency planning and decision-making on early warning systems, integrating a gendered perspective into information systems and risk communication. The CNE’s Gender Mainstreaming Strategy (CNE et al 2022) and the Guideline on Breastfeeding and Risk Management (SNGR et al 2025) further reinforce the importance of recognizing the care roles assumed by women during extreme hydrometeorological events, as well as the need to build technical capacities that enable their active participation in prevention, response, and recovery processes.

In Panama, the Country Profile on Gender Equality (UNICEF et al 2020), the report “Gender Equality in Panama: What Do the Numbers Say?”, and the Survey on Perceptions of Climate Change in Panama (Ministry of Environment Panamá 2023) show that although women demonstrate high environmental awareness and commitment to sustainable water management, they continue to face structural limitations in access to resources, climate information, and decision-making spaces. The Study About Women in Panama 2017–2021 (Ministry of Women of Panama 2024) also highlights the underrepresentation of women in technical bodies related to climate change and water management. However, government-led initiatives in Panama aimed at promoting women’s inclusion in watershed governance have demonstrated that their participation contributes to greater community cohesion, environmental sustainability, and strengthened resilience to droughts and floods. Both countries have ratified the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), establishing binding obligations to guarantee non-discrimination and promote women’s equal access to resources and services, including climate information systems and early warning mechanisms. In Panama, the former National Institute for Women (INAMU) was elevated to the Ministry of Women in 2023, strengthening the institutional framework for gender mainstreaming across public policy, including disaster risk management and climate adaptation.

In alignment with these findings, the project will integrate a gender responsive approach that promotes equitable participation in hydroclimatic and early warning systems through the establishment and preparation of drought and flood national plans with an inclusive approach, as well as the preparation of gender action plans with appropriate indicators for monitoring and evaluation; and gender transformative trainings that enable gender mainstreaming in the project outcomes. Furthermore, it will promote the use of local knowledge and the recognition of women’s roles as community water resource managers, ensuring that the evolution of gender dynamics—from limited participation toward active co-responsibility—contributes to a sustainable transformative change and the consolidation of more inclusive climate governance in Costa Rica and Panama.

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

The project represents a cost-effective investment by combining four interrelated components (monitoring, forecasting, regional management and governance) that generate tangible and sustainable socio-economic benefits mentioned in the previous section (C). With a total investment of US \$18,956,000, the project prioritizes strategic investments in strengthening the hydrometeorological network, operation of SAT, hydrometeorological data management, generation of information for decision-making, capacity building and institutional strengthening. This investment is expected to result in significant savings through:

- Direct harm reduction (infrastructure, housing, crops, and livestock),
- Decreased response and recovery costs,

- Optimization of water use,
- Better decision-making based on data and relevant and timely information.

As mentioned above, a socio-economic benefits analysis will be developed. This exercise will help estimate benefit-cost figures that quantify, for every dollar invested in monitoring, analysis and dissemination of drought and flood information, the savings in maintenance, emergencies and avoided losses, among other items. In addition, knowledge management and replicability of good practices (through learning communities, including at the basin level) will reduce operating costs, since it will not be necessary to duplicate effort or investment in processes or technologies in different communities or countries.

The EWS developed from this project integrate reliable and timely data for decision-making, which represents one of the most cost-effective measures to reduce damage due to hydrometeorological events. This strategic investment allows us to anticipate impacts and significantly reduce the costs of response, recovery and economic losses.

National commitments

National governments will provide in-kind and/or financial resources in addition to the activities supported by the Adaptation Fund, which will facilitate greater impact and progress in reducing vulnerability to drought and floods. National public procurement standards (value for money) will be adopted and structured cost-benefit evaluations will be integrated for each component. Therefore, the cost effectiveness of the project is based on the recognition at the national and local levels of the importance of preventive care for drought and floods, based on data management, timely warning, and community and national participation in planning. The project will seek the social and economic profitability of its activities.

Likewise, it is expected that the resources of the Adaptation Fund and national budgets will not be the only ones within the project, as they will help to mobilize other national private financial funds, and local human and material resources, such as:

- Complementary private investments and leverage by creating synergies for the protection and prevention of damage to economic activities mainly at the national level
- Active participation of local institutions, economic sectors and beneficiaries (communities) in the selected watersheds

Resource Management

International (WMO), Central American and national standards will be adopted to ensure the quality of data and products, optimize processes, and coordinate people, technologies and policies in an up-to-date and effective manner.

Operationally, the resources of the Adaptation Fund will be managed with fiscal rigor and in accordance with regulations, including national and SICA, guaranteeing efficiency and value for money. It will seek to effectively use resources and seek to ensure that the operating costs derived from the project, even if limited, are sufficient for implementation without sacrificing the expected products and results.

Regional focus

The regional approach from the beginning allows not only access to knowledge, techniques and practices that support the national level from the regional level, but the efforts in the project will also pay off by having organizations such as the WMO and the CRRH that will be able to extend the scope of the project at the regional level to all of Central America by storing and managing the knowledge acquired. reviewing the best practices of the project, refining processes and activities and mobilizing resources to achieve such extension. These activities will be carried out especially in component 4.

The main factors taken into account that favour the regional approach on two national projects are:

- Economies of scale: it is allowed to concentrate and share resources reducing the costs per country for the operation of technical solutions, training, purchase of equipment, etc. In addition, the institutional and technological infrastructure already existing in the region (for example, CENTROCLIMA) is used¹³.
- Institutional synergies: existing regional expertise and structures are leveraged and implementation is accelerated. Central America already has an important regional integration, led by SICA and that includes hydrometeorological services through the CRRH. Likewise, the WMO, the CRRH and GWP already have experience in implementing projects for Central American countries, so this effort is being used to support at the national level.
- Training and knowledge management: training carried out with a regional focus can serve to standardize and standardize practices, as well as generate/strengthen communities of practice on issues related to the project. In addition, knowledge management will facilitate technology transfer and the exchange of good practices between institutions and communities.
- Operability: By taking a regional approach, it is ensured that efforts are taken into account throughout the region to avoid redundancies/duplications at the national level and optimizing maintenance, commissioning and use of technologies and methodologies, allowing the sharing of operation and maintenance costs, reducing national costs. An improvement in data and information interoperability systems is also ensured.
- Institutionalization of impact risk analysis: Although there are initiatives at the national level, the use of impact risk analysis is not widely used and through the project its institutionalization and replication can be supported.
- Replicability and sustainability: the results of the project can be conserved and replicated regardless of personnel changes in each country, in addition to reducing dependence on support or not from specific people at the national level. In addition, there are more possibilities to obtain additional financing once the project is completed by having a regional impact instead of a national one. Finally, it is expected that the scope of the project can be expanded to other Central American countries as additional funding sources are identified, being able to make use of the materials, lessons learned, expertise, etc. already generated within this project.

The implementation of this project is very significant because it addresses a number of key issues for Costa Rica and Panama, but also for the Central American region, so the replicability of the approach, outputs and expected results can contribute to neighbouring countries. For example, the study of the monitoring network will provide the essential elements to detail an acquisition plan for the priority basins and for the proper implementation of hydrometeorological services and early warning systems that can be replicated in other countries in the region.

As justification, Tab. 2 has been created for comparing cost effectiveness of the proposed measures in the project versus business as usual.

Tab. 2. Comparative table showing cost effectiveness of each measure compared to business as usual.

Proposed Measure	Cost Effectiveness	Business as usual	Cost Effectiveness
Strengthening of the hydrometeorological monitoring network	High – Full national coverage to provide timely data for decision making to protect communities and infrastructure	Operate current hydrometeorological network	Low – Insufficient coverage to alert or not timely on floods and droughts
Establishment of national hydrometeorological databases	High - Sound baseline for water resource planning, watershed modelling and early warning	Separate and incomplete hydromet data bases	Low – Unable to support decision making for early warning and water resources planning
Start-up/modernization of EWS	High - Timely alert to reduce cost for disaster response, and human and economic losses caused by floods and droughts	Obsolete or nonexistent EWS	Low – High risk of losses and damages due to increasing floods and droughts events

¹³ The CRRH's CENTROCLIMA platform allows NMHSs to access climate data, severe weather products, as well as meteorology, hydrology and climate portals and other specialized products, optimizing technical resources at the regional scale.

Training and awareness-raising programmes for vulnerable communities	High – Prepared and resilient communities with information and protocols to address hydromet events such as floods and droughts	Vulnerable communities without sensibilization of the flood and drought risk management	Low – Increasing economic, environmental and human losses due to natural hydromet events and lost livelihoods
Development of drought and flood management policies and plans at the national and local levels	High – improved decision making through droughts and floods vulnerability reduction programmes established in policy and planning at the national and basin levels	Vulnerable national and local governments without policies and plans	Inefficient spending of budget and disjointed government
Adaptation activities implemented at the local (basin) level to reduce vulnerability and increase resilience	High – More resilient communities through implementation of adaptation measures with potential of replicability to other basins and development of community of practice	Local population without the capacity to cope with hydromet disasters	Low – Lack of effective measures to build resilience and adapt to flood and drought impacts.

The cost-effectiveness analysis compares the proposed adaptation measures against business-as-usual scenarios and reactive disaster response approaches. The analysis demonstrates that investments in integrated hydrometeorological monitoring systems, early warning systems, and anticipatory risk management generate significantly lower long-term costs than post-disaster reconstruction and emergency response measures.

In addition, the regional coordination approach enhances efficiency through shared methodologies, interoperable platforms, harmonized technical standards, regional knowledge exchange, economies of scale in capacity development, and optimization of institutional resources. International evidence also demonstrates high benefit-cost ratios associated with Early Warning Systems and climate information services.

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

The project is fully aligned with national and subnational strategies and plans for sustainable development and adaptation to climate change in Costa Rica and Panama, as well as with relevant regional frameworks. This coherence ensures that their interventions contribute to the achievement of goals already prioritized by governments, thus strengthening institutional, social, economic and environmental sustainability.

Regional level

The project is in line with a number of regional frameworks promoted by SICA, including:

- Plan de Acción Regional de Adaptación al Cambio Climático en Centroamérica
- Política Centroamericana de Gestión Integral del Riesgo 2015–2030
- Estrategia Centroamericana de Desarrollo Rural Territorial 2010–2030
- Estrategia de Agricultura Sostenible Adaptada al Clima para la Región SICA 2018–2030

These regional strategies prioritize integrated water resources management, adaptation to extreme weather events such as droughts and floods, agricultural resilience, and capacity building and climate governance. The project contributes to these priorities through actions that:

- They strengthen national and local early warning and climate monitoring systems.
- They support, with the products to be developed, adaptive territorial planning and the reduction of social vulnerability
- Promoting effective transboundary cooperation in the Sixaola Pilot Basin

National level

In the first instance, both Costa Rica and Panama have included within their Nationally Determined Contributions (NDCs) commitments related to the improvement of the TSS, integrated watershed management, access to agroclimatic information and the implementation of financial mechanisms for adaptation. This project advances directly in these priority areas, ensuring synergies with international commitments under the Paris Agreement. More specifically:

- In Costa Rica, the project aligns with Costa Rica's Determined Contribution (NDC2020¹⁴), which prioritizes climate resilience through actions in vulnerable sectors such as water resources, agriculture, and coastal zones. It responds directly to the objectives of the National Strategy for Adaptation to Climate Change (ENACC), promoting integrated risk management, ecosystem-based adaptation and the strengthening of local capacities.
- In Panama, the project is consistent with Panama's Second Nationally Determined Contribution (NDC2),¹⁵ which incorporates an adaptation approach that prioritizes water security, the resilience of rural communities, the strengthening of infrastructure in the face of extreme events, and climate risk management. It is aligned with the National Climate Change Strategy (ENCC) and with the adaptation component of the CRC2, which contemplates the improvement of resilient infrastructure, the strengthening of monitoring systems and the reduction of social vulnerabilities. It also contributes to the objectives of the National Development Plan with Social Inclusion, supporting communities in conditions of poverty through NbS and adaptive territorial planning.

In both cases, in addition to the NDCs, there are other related short- and long-term climate policy instruments for which the results and outputs of the project have a direct and indirect impact.

In Costa Rica, the project is consistent with the National Disaster Risk Management Plan, which is updated every five years and is harmonized with the Sendai Framework and the Paris Agreement. In this sense, it strengthens risk governance based on an ecosystem and intersectoral approach, integrating NbS and community participation mechanisms. The project also supports the implementation of the National Development and Public Investment Plan 2023-2026, which promotes sustainable and inclusive territorial development, with special emphasis on populations exposed to climate threats such as droughts and floods. Tab. 3 shows which national instruments are taken into account in the different components of the project.

Tab. 3. National Policy Instruments of Costa Rica and their relationship to Project Components.

Project Component	Related National Policy Instruments of Costa Rica
1. Hydrometeorological observing, monitoring, and data management infrastructure improved for risk awareness and Early Warnings	- National Adaptation Plan (NAP) 2022–2026 - National Climate Change Adaptation Policy 2018–2030 - National Water Resources Management and Watersheds Program - National Meteorological Institute Strategic Plan (not yet public)
2. Institutional set-up and processes for risk knowledge and Early Warning	- National Adaptation Policy- NDC2020 - National Development and Public Investment Plan 2023–2026 - National Disaster Risk Management Plan - Law No. 8488 on Emergency Management and Risk Prevention
3. Flood and drought management and risk mitigation enhancement from regional to local level	- National Drought and Flood Plan - National Risk Management Policy - ENACC - National Disaster Risk Management Plan - National Program for the Management of Water Resources and Watersheds

¹⁴The NDC2020 focuses on increasing the resilience of communities to climate change. It includes improving water management and infrastructure to reduce vulnerability to extreme events such as droughts and floods. In addition, sustainable agricultural practices and ecosystem restoration are promoted to mitigate the impacts of droughts and floods. In addition, it promotes international collaboration to implement innovative climate actions. <https://cambioclimatico.minae.go.cr/contribucion-nacionalmente-determinada-ndc-de-costa-rica/principales-elementos-de-la-ndc-2020/>

¹⁵ The CRC2 is based on an integrated approach to adaptation and mitigation, under the principles of climate justice, equity and common but differentiated responsibilities, through a just transition that safeguards water security, with active participation based on human rights and gender equality. At the same time, NbS are integrated. Adaptation and mitigation actions complement each other to build resilience. [Segunda-Contribucion-Determinada-a-Nivel-Nacional-de-Panamá-CDN2.pdf](#)
[Environmental-Social-Policy-approved-Nov2013.pdf](#)

	- SINAC (National System of Conservation Areas) Strategy for the Conservation and Sustainable Use of Water Resources 2021-2026 - National Drinking Water Policy 2017–2030 - Law No. 8488 on Emergency Management and Risk Prevention
4. Enabling environment for building resilience to floods and droughts	- NDC 3.0/ 2025 - 2035 - NAP 2022–2026

In Panama, the project is aligned with Panama's National Water Security Plan and also takes into account the legal and institutional framework around risk management and climate action, including inter-institutional cooperation agreements such as the one established between the Ministry of Agricultural Development (MIDA) and IMHPA, which facilitate technical exchange and the integration of agrometeorological and hydrological data. Tab. 4 shows which national instruments are taken into account in the different components of the project.

It should be noted that Panama, as one of the few carbon-negative countries, recognizes that adaptation is an essential pillar of its climate strategy, and this project contributes directly to this goal.

Tab. 4. National Policy Instruments of Panama and their relationship to Project Components.

Project Component	Related National Policy Instruments of Panama
1. Hydrometeorological observing, monitoring, and data management infrastructure improved for risk awareness and Early Warnings	- IMHPA's Institutional Strategic Plan 2023-2030 - National Water Security Plan 2015–2050 - Climate Change Adaptation Monitoring and Evaluation System - NDC2 (monitoring component) - National Integrated Waste Management Plan 2017–2027
2. Institutional set-up and processes for risk knowledge and Early Warning	- National Climate Change Policy to 2050 - NDC2 - National Climate Change Strategy - National Water Security Plan 2015–2050 - Vulnerability Index and National Climate Transparency Platform - National Strategic Plan for Comprehensive Disaster Risk Management 2022-2030 (PENGIRD)
3. Flood and drought management and risk mitigation enhancement from regional to local level	- National Drought Plan - National Climate Change Strategy - National Climate Action Plan - National Water Security Plan 2015–2050 - National Climate Change Plan for the Agricultural Sector (PNCSSA) 2018-2030 - National Energy Plan 2015–2050 and Electricity Transition Agenda 2020–2030
4. Enabling environment for building resilience to floods and droughts	- National Development Plan with Social Inclusion - National Gender and Climate Change Plan - National Strategy for Climate Empowerment (ENACE) (climate empowerment section) - NDC 3.0 NATURE PLEDGE - National Strategy for Resilient Socioeconomic Development - MIDA–IMHPA Cooperation Agreement

Local level

At the subnational (local) level, the project aligns with the specific management priorities of each prioritized watershed. In Costa Rica, the Tempisque and Parrita basins have monitoring networks, environmental flow studies, and wetland conservation projects promoted by MINAET to strengthen and expand efforts through the development of early warning systems, hydroclimatic governance, and adaptive planning based on local platforms. In Panama, the La Villa and Tonosí River basins have instruments such as the Municipal Water Resilience Plans, Territorial Environmental Planning Plans (POAT) and MiAMBIENTE-CCAD projects, which integrate monitoring, conservation and community participation.

Full alignment with the Management Plans of the basin organizations for the selected basins will be sought, in addition to seeking to reinforce these plans with the results of the project.

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

The proposed project is consistent with the Environmental and Social Policy of the Adaptation Fund, as well as with the regulations and policy instruments of Costa Rica and Panama. An analysis of the national texts fully reflects the rules of the Adaptation Fund, which will be demonstrated by evaluations and feasibility studies of how the project adheres to them in the project preparation phase. The project proposes the development of articulated national protocols for the proper operation and functioning of the CRGIS. It is also expected to be updated through decrees or other political instruments to create policy and governance mechanisms and instruments for preventive and reactive attention to droughts and floods.

National regulations

In Costa Rica, the project is aligned with the Organic Law of the Environment (Law No. 7554) and current technical regulations, complying with the guidelines established by MINAE (including its Water Directorate and Climate Change Directorate), the National Meteorological Institute (IMN) and the National Emergency Commission (CNE). All infrastructure activity or equipment installation will follow the requirements of the National Environmental Impact Assessment System (SETENA), the CFIA building codes, and will be coordinated with the National Multi-Hazard Early Warning System. The project also contributes to the fulfillment of the National Policy for Disaster Risk Management and Climate Change 2020–2030, the National Strategy for Adaptation to Climate Change (ENACC) and the goals of the Nationally Determined Contributions (NDCs), especially in water resilience and ecosystem-based adaptation.

In Panama, the project complies with the provisions of the General Environmental Law (1998) and the Environmental Impact Assessment System (SEIA), following the technical guidelines of the Ministry of Environment (MiAMBIENTE), including its Climate Change Directorate and the Water Security Directorate, as well as the Institute of Meteorology and Hydrology of Panama (IMHPA). Activities with physical components, such as monitoring stations or data systems, will comply with the Panama Building Code and environmental permitting and licensing procedures. In addition, coherence is ensured with key instruments such as the National Drought Plan, the Action Plan for Integrated Water Resources Management (PAGIRH 2022–2026) and the priorities of the Government's Strategic Plan 2024–2029 in terms of sustainability and risk reduction.

In both countries, the proposed actions respect international standards such as those established by the World Meteorological Organization (WMO) and regional standards such as SICA and the Escazú Agreement, guaranteeing interoperability, data governance and early warning mechanisms with a rights-based approach. For example, in the case of Panama, aspects related to data in the cloud will be done in accordance with the specifications of the National Authority for Government Innovation (AIG), which offers IMHPA space in its computing cloud. In addition, the development and updating of national protocols articulated with decrees or other policy instruments is foreseen, to strengthen coordination and response to droughts and floods. The use of tools such as the Municipal Risk Management Guide of Panama and other official methodologies will make it possible to identify and prioritize vulnerable communities in each territory. In this context, the project not only complies with current regulations, but also strengthens the institutional and technical capacity for its effective application, generating synergies with processes already underway and contributing to the resilient development of priority basins.

Vulnerable communities

National guides will be used for the identification of vulnerable communities, as is the case of the National Risk Management Policy of Costa Rica and the Municipal Guide of Disaster Risk Management in Panama. In the specific case of the correct integration of indigenous communities, existing documentation will be taken into account, for

example: the Planning Framework for Indigenous Peoples (MPPI) of Costa Rica, the Guide for the Institutional Care of Indigenous Peoples of Costa Rica, the Comprehensive Development Plan for Indigenous Peoples of Panama and the Environmental and Social Management Framework (ESM) of Panama.

Early Warning Systems

Likewise, the project contemplates the strengthening and expansion of the EWS as a key technical measure for adaptation and risk reduction in pilot basins. These actions will be aligned with the regulatory frameworks of each country: in Costa Rica, they will be integrated into the development of the National Multi-Hazard Early Warning System led by the CNE; and in Panama, they will be linked to the guidelines of the National Drought Plan and the EWS systems identified in the national inventory carried out with the support of UNESCO. The interventions will be developed in accordance with national and international standards in interoperability, risk communication and community participation, ensuring their sustainability and accessibility to vulnerable populations.

Gender

The project is aligned with relevant national legal and policy frameworks on gender equality and non-discrimination in both countries, which provide the foundation for inclusive climate action and the protection of vulnerable groups. In Costa Rica, implementation is consistent with the Law for the Promotion of the Social Equality of Women (Law No. 7142) and the broader gender equality framework that mandates equal participation of women in public decision-making and access to resources, including in disaster risk management and climate action. In Panama, the project aligns with the Law on Equal Opportunities for Women (Law No. 4 of 1999, and subsequent amendments), which establishes the State's obligation to mainstream gender equality across public policies and programmes. By aligning with these legal frameworks, the project ensures that the design and implementation of hydroclimatic services, early warning systems, and basin-level planning explicitly promote the inclusion of women and other vulnerable groups, reinforce rights-based approaches, and contribute to equitable and sustainable adaptation outcomes.

Environmental and Social Policy of the Adaptation Fund

The project complies with the Environmental and Social Policy of the Adaptation Fund, as it has been designed to avoid negative impacts on the environment and communities, focusing on strengthening institutional capacities, improving monitoring and warning systems, and integrating climate information into decision-making. These actions do not involve large-scale physical interventions and, on the contrary, generate concrete benefits for the populations most vulnerable to droughts and floods, promoting more inclusive and effective risk management.

Since its formulation, a participatory approach has been contemplated that ensures the inclusion of various actors. In the next stages, more participation will be sought, especially women, rural and indigenous communities. In addition, an Environmental and Social Management Plan will be developed to identify and manage possible risks, as well as a participatory mechanism and/or process in the communities neighbouring the pilot basins, taking into account in particular the gender perspective and vulnerable groups, indigenous and peasant, through citizen participation actions for decision-making and respecting their human rights. In addition, the project recognizes and respects the principles established in the United Nations Declaration on the Rights of Indigenous Peoples, in particular the right to full and effective participation, and prior, free and informed consultation. All this seeks to ensure that the project is implemented in a responsible, transparent manner and with long-term sustainable benefits.

For more details on the 15 principles of the Adaptation Fund's Environmental and Social Policy, please see Tab. 7 of section L.

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

At this time, no duplication with other projects or sources of funding is identified. From its pre-concept phase, this proposal was developed through an exhaustive mapping of relevant national and regional initiatives in Costa Rica and Panama, in order to guarantee synergies, avoid redundancies and maximize impacts. This process included virtual and face-to-face consultations (2024–2025) with key national actors, such as NMHSs, NDMAs, as well as regional actors (CRRH and GWP-CAM).

In Panama, the lessons learned from the project "Adaptation to climate change through integrated water resource management" implemented by Fundación Natura with the support of the Ministry of Environment and MIDA were taken into account. This project strengthened local and national capacity for decision-making based on climate data, improved the management of priority watersheds (Chiriquí Viejo and Santa María), and promoted knowledge exchange platforms.

This new proposal does not duplicate that effort, but rather complements and expands it, by focusing on the improvement of Early Warning Systems (EWS), the integration of hydrological and climate information at different levels, and the strengthening of institutional and community capacities in new priority watersheds. As a lesson learned, the current project incorporates from the design commitments for the post-project maintenance of monitoring stations and institutional frameworks to ensure sustainability.

In Costa Rica, the project "Program for the Development of Resilient Infrastructure and Territorial Development", financed by the WB for USD 500 million, is in the preparation phase. While it also seeks to reduce the vulnerability of exposed populations, its focus is on the reconstruction and planning of disaster-resilient physical infrastructure. This project is complementary to the Adaptation Fund, since it does not contemplate the strengthening of hydroclimatic warning or monitoring systems, so both are articulated synergistically in the risk management cycle: one in structural prevention and the other in early warning and data-based planning.

At the regional level, other relevant initiatives are identified, such as:

- The project under preparation by IFAD and the Adaptation Fund on early warning services in agriculture. This proposal focuses only on the agricultural sector, while the current project has a multisectoral approach and strengthens capacities at the national and regional levels to improve decision-making in sectors such as drinking water, hydropower, risk management, and food security. In the event of geographical coincidence, coordination mechanisms will be established to ensure interoperability between the hydrometeorological monitoring networks of both projects.
- The Green Climate Fund's regional proposal implemented by CABI, FAO and CCAD on Ecosystem-based Adaptation (EbA) in the Dry Corridor and drylands of the Dominican Republic. Although it addresses water security, it focuses on ecosystem restoration and improvement of agricultural landscapes, while the current proposal acts on risk planning based on climate and hydrological information.
- Tab. 5 shows a couple of more identified projects.

Tab. 5. Projects and programs in execution and/or planning in the region.

	Project Name	Objective	Synergy/Comments
1	Panama: Adaptation to change through integrated water resource management in Panama implemented by the Natura Foundation of Panama. In Execution	Establish climate-resilient water management to improve food and energy security at the national level, through an integrated, community-based approach in the Chiriqui Viejo and Santa Maria River basins.	The lessons learned from the experience in strengthening national and local capacity with databases derived from monitoring (EWS) and decision-making to reduce risks associated with climate change and from the knowledge exchange platform, will undoubtedly serve as the basis for the project.

2	Costa Rica: Program for the Development of Resilient Infrastructure and Territorial Development. Investment: BM. Executing entity: CNE. Approved March 2025	Increase access to disaster-resilient infrastructure with an emphasis on the intervention of territories with vulnerable populations, particularly people in conditions of poverty and social exclusion.	The project proposal for the World Bank focuses on the design and construction of water infrastructure, among other types, an aspect not contemplated in the project for the Adaptation Fund. These works are complementary to the planning and establishment of an EWS for floods and droughts. In other words, an adequate synergy is generated between both projects for the management of risks due to hydrometeorological phenomena.
3	Multi-hazard impact-based forecasting and early warning services for increased climate change adaptation investments in Costa Rica, Panama, and the Dominican Republic. Investment: Adaptation Fund. Implementer: IFAD in preparation – Pre-concept Note	Improve the climate resilience of Research-operations in agricultural, livestock, agroforestry, and agrotourism activities in vulnerable areas of Costa Rica, Panama, and the Dominican Republic through the generation and use of climate information in decision-making and improved access to credit and technical assistance to adopt climate change adaptation practices.	Hydrometeorological observations and networking and modelling for enhanced multi-hazard EWS at specific sites will contribute to generating experiences and data that will serve at the national level for the project.
4	Costa Rica and Panama: Ecosystem-based adaptation and transformational measures to increase resilience to climate change in the Central American dry corridor and drylands of the Dominican Republic. Investment: Green Climate Fund (GCF) Implementer: CABEL. Executors: CABEL, FAO and CCAD. In Execution	Address the impacts of climate change at the landscape and household levels in priority watersheds by promoting Ecosystem-Based Adaptation (EbA) strategies based on improving the conditions of forests and agroforestry systems in prioritized watersheds and promoting efficient technologies for the use of water and resources in rural communities.	The generation of experiences and knowledge in local ecosystem restoration projects through EbA to improve water security conditions in the face of future climate variability, optimize hydrological flow and rainwater infiltration into groundwater reserves, as well as the use of innovative and efficient technologies to reduce water demand in the dry corridor. They will be used to design national and local planning for drought measures, which is a relevant component of the project.
5	Costa Rica: Improving Climate Services for Infrastructure Investments (CSI). Investment: GIZ Beneficiaries: Investors, planners, operators, owners and users at the national level of infrastructures resilient to climate change, through the use of Climate Services. Concluded	Support in the provision and use of Climate Services, integration of the use of these Services in infrastructure planning, climate risk analysis of infrastructure and international exchange and transfer of knowledge.	Information and experiences can be shared regarding climate data and integration into planning processes at the national and regional levels. The information generated by the Adaptation Fund project can serve as inputs for the resilient infrastructure planning expected in the GIZ project.
6	Costa Rica: "Supporting the food security of the indigenous population in the face of the effects of climate change through the promotion of resilient family farming" & "Capacity building and contribution to the rural sector for the application of climate change adaptation and mitigation technologies, and Implementation of measures to adapt water resources to climate change". Investors: Adaptation Fund Beneficiaries: Local Communities (including development associations, farmers, fishermen, and citizens); Institutions and Local Governments (Municipalities, ministries, and conservation systems); Specific Sectors: Agricultural, water supply, fisheries, and infrastructure sectors. In Execution	Improve the resilience of communities and ecosystems to climate change through the implementation of adaptation and mitigation measures, capacity building, and sustainable infrastructure development.	Collaborate in the development and creation of hydrometeorological and climate information as well as seek to ensure that training programs can be multi-purpose. The projects can serve as leverage with the government and Ministries to cause the necessary impact for the improvement of climate governance and sustainability. In particular, the project "Implementation of measures to adapt water resources to climate change" involves an EWS in one of the priority Basins, therefore close collaboration will be sought to avoid any possible overlaps.

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

The project contemplates a comprehensive learning and knowledge management strategy, designed to capture, systematize and disseminate lessons learned throughout its implementation. This strategy is incorporated into Component 4 (Outcome 4.2, Output 4.2.2), which includes capacity building, with a cross-cutting focus on gender, social inclusion and attention to the most vulnerable actors.

Regional and national level

Knowledge management will be led by WMO, SICA, CRRH and GWP, in close coordination with the national institutions of Costa Rica and Panama. This work will include:

- Production of specialized materials (manuals, technical catalogues, protocols, e-learning platforms such as Moodle and other didactic resources). Materials available in Spanish and adapted to the Central American context will be used.
- Collaboration with local universities and academic centres to ensure the contextualisation and sustainability of the knowledge generated.
- Integration of results into regional and global knowledge-sharing platforms, including GWP and WMO initiatives.
- Generation of case studies, development of face-to-face and virtual training, exchanges of experience, and creating a Community of Practice

Knowledge delivery and capacity development will, therefore, include formal courses, technical workshops, inter-institutional exchanges, professional secondments, and on-the-job training initiatives. In addition, the documentation of experiences will be promoted through case studies, good practices and technical publications that allow replicability and scalability in the region.

Local level

Learning will be a central axis in the implementation of the pilot activities in selected basins. Communities will be actively involved from the design phase to implementation and evaluation, with activities including:

- Participatory consultations for drought and flood planning (Outcomes 3.2 and 3.3).
- Community training for the maintenance and operation of Early Warning Systems (EWS) (Outcome 2.3).
- Co-design of products and services based on data and information, such as risk assessments, vulnerability assessments and adaptation plans.
- Knowledge transfer along the hydrometeorological value chain: including disaster risk, hazard detection, observation, monitoring, analysis and forecasting, the dissemination and communication of warnings, and appropriate preparedness to respond to alerts.
- Transfer of cultural and ancestral knowledge, particularly in indigenous and Afro-descendant communities, respecting and leveraging their wisdom for climate risk management.

A local capacity-building program will be established to foster community resilience, promoting tools such as NbS and citizen empowerment. This program will adopt an intersectional and intergenerational approach, ensuring respect for human rights and the inclusion of women, young people, and people in vulnerable conditions.

Communities must have the culturally-appropriate knowledge to assess risk situations, as well as individual, family and community responses to them. The central purpose is to integrate risk management as a fundamental aspect of their coexistence and daily life.

Institutional strengthening and technical training

Through WMO Regional Training Centres (RTCs)¹⁶ and with the support of specialists, international organizations (GWPs and their community of practice) and academic centres, capacities will be developed (in particular with regard to droughts and floods) and hydrometeorological data development and management. These capacities will strengthen the human resource in its competencies and skills, including the adoption of elements such as the integration of a documentary collection, constituted with those documents or publications of a technical nature, as well as based on the experiences of the human resources trained through the project.

Some specific actors that will support in this context are:

- University of Costa Rica (UCR): Collaboration to lead training in meteorology.
- A Panamanian institution to be identified: Strengthening of that institution to assume the role of WMO RTC in hydrology, with the aim of ensuring post-project sustainability.
- Faculty of Engineering and Water Sciences of the National University of the Litoral (FICH-UNL) in Argentina: Cooperation for technical support in the development of content and training in hydrology for Central America, taking advantage of its previous experience with the WMO in Spanish-speaking countries.

Linking with EW4All

The learning strategy will be aligned with the four pillars of the UN's EW4All initiative, which are (1) "Disaster Risk Knowledge", (2) "Detection, Observation, Monitoring, Analysis and Forecasting", (3) "Warning Dissemination and Communication" and (4) "Preparedness and Response Capabilities". These pillars will guide the design of educational materials, training sessions and community engagement, reinforcing the preparedness of national and local systems to implement early action in the face of extreme hydrometeorological events. It will coordinate with institutions leading each of the four pillars mentioned above: UNDRR (pillar 1), WMO (pillar 2), ITU (pillar 3) and IFRC (pillar 4).

Sustainability of knowledge

Finally, the project will seek to institutionalize the knowledge generated, integrating it into regulatory frameworks, public policies, and academic curricula. The creation of a regional digital platform that functions as a repository of data, tools, case studies and lessons learned accessible to all stakeholders will also be encouraged. This platform will be linked to CENTROCLIMA.

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

The project is based on the Roadmaps developed between 2021 and 2023, which assessed current capacities and identified priorities for strengthening hydrometeorological services in Costa Rica and Panama. The consultation process carried out for this activity was carried out in conjunction with the Inter-American Development Bank and involved the NMHS of both countries, as well as the institutions that use their services, in the foreground. While the roadmaps cover improvements at the national level, the project addresses specific needs identified in these plans, taking into account several of the recommendations set out therein for the conceptualization of this project. This request arises from the country's urgent need to address the growing challenges related to droughts and floods exacerbated by climate change, given the associated risks and increasing losses in recent years.

¹⁶ A WMO RTC is an institution or a coordinated group of institutions that provides training in meteorology, hydrology and related sciences to meet the needs of the Region. It is established to satisfy the requirements expressed by more than half of the Regional Association Members who cannot be satisfied by existing facilities.

During the formulation of the pre-concept and concept note, relevant information was integrated in a timely and regular manner from stakeholders from both countries and the region through a series of bilateral and group technical meetings, a virtual regional meeting, and face-to-face consultation workshops in the two countries part of the project. The objective of the meetings was to ensure the participation of key national and regional stakeholders, which served to integrate relevant information from the countries and priority basins, discuss the documents, as well as resolve comments and concerns during the design of the project.

A summary of the different meetings that served as consultation is presented below:

- Face-to-face workshops in Panama and Costa Rica respectively to validate the information of the roadmaps for the strengthening of hydrometeorological services in both countries [July and September 2022]
- Bi-monthly follow-up meetings and generation of the pre-concept note [2023]
- Regional Technical Consultations: Several virtual sessions were held with the participation of representatives from the two countries, the CRRH, GWP-CAM and the WMO regional office. The objective of the meetings was to identify common priorities, reconcile and agree on the objectives and expected results of the project, as well as the participation of regional actors in the implementation of the project [2023-2024]
- Ad-hoc meetings to follow up and discuss the preparation of the concept note [January to July 2024]
- Coordination meetings for the concept note development and collection of information [August to December 2024]
- Biweekly technical meetings: Virtual meetings with the technical team of the two countries, with the aim of sharing progress on project design, data and information collection, securing national and regional priorities, and conducting technical consultation [January to March 2025]
- National consultations (the results of which are reflected in this document):
 - o The face-to-face workshop in Costa Rica was held from February 12 to 14, 2025 and included the following Institutions: National Emergency Commission, Water Directorate of the Ministry of the Environment, Costa Rican Institute of Electricity, National Meteorological Institute, Regional Committee on Water Resources of the Central American Integration System (CRRH-SICA), Global Water Partnership- Central America, WMO Regional Office for Central America and the Caribbean.
 - o Virtual consultation workshops in Costa Rica were held on June 29 and July 1, 2026, engaging 36 key stakeholders from the Tempisque and Parrita-Candelaria river basins. These consultations validated the project's multi-sectoral and integrated basin management approach, gathering active support from local communities, the agricultural and irrigation sectors (such as banana and oil palm producers, and SENARA), environmental protection actors, and technical institutions like ICE. Stakeholders emphasized that project sustainability depends on water security – including human consumption, ecosystem protection, and environmental flows – as well as translating technical hydro-climatic data into accessible, practical tools for decision-making and risk reduction at the local level. The Initial Consultation Report is presented in Annex 3.
 - o The face-to-face consultation workshop in Panama was held from February 17 to 18 and included the following institutions: Civil Aeronautics Authority, Panama Canal Authority, Institute of Agricultural Innovation, Government Innovation Authority, Panama Maritime Authority, La Villa River and Tabasará River Basins Committee, Natura Foundation, National Institute of Aqueducts and Sewers, Inter-American Institute for Agricultural Cooperation, Meteorological and Hydrological Institute of Panama, Ministry of Environment (Directorates of Climate Change, Water Security and International Cooperation), Ministry of Agricultural Development, Ministry of Economy and Finance, Ministry of Government via the National Civil Protection System, University of Panama, Technological University of Panama, Regional Committee on Water Resources of the Central American Integration System (CRRH-SICA), Global Water Partnership - Central America, WMO. This national consultation in Panama established technical consensus on the urgency of climate adaptation and early warning systems, highlighting the governance role of IMHPA and prioritizing the highly vulnerable Tonosí and La Villa river basins.
- Virtual Concept Note Validation Meeting with Both Countries [June 2025]

For the next phase of project note generation, the same institutions will be consulted, as well as vulnerable groups, basin committees and specific beneficiary sectors. Among other materials, GWP's "A Guide for Multi-Stakeholder Partnerships in Water Management" and "Gender in Climate Change and Water". The knowledge base developed in the context of the WMO and GWP joint programmes on integrated flood and drought management programmes will be leveraged to integrate community aspects. They provide practical guidance for establishing and strengthening multi-stakeholder partnerships in water management as well as guidance focused

on gender inclusion and community actions that will inform the design of activities and outputs in this project. Special attention will be given to maintaining an open and respectful dialogue, using strategic communication to engage external audiences, choosing appropriate communication channels, recognizing and addressing water-related conflicts, promoting joint vision and scenario building, involving vulnerable sectors and with special attention to a gender perspective.

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

To address the growing challenges related to climate change, funding of nearly US\$23million is requested to implement adaptation measures in Costa Rica, Panama, and at the regional level. This financing is crucial to cover the full costs of providing information, products, and services for climate adaptation. These costs are divided into the following in two categories:

- Adaptation Infrastructure: Strengthening of the hydrometeorological monitoring network, establishment of national hydrometeorological databases and start-up/modernization of SAT.
- Non-Structural Measures: training and awareness-raising programmes for vulnerable communities and development of drought and flood management policies and plans at the national and local levels. Activities at the local (basin) level to generate knowledge on adaptation and resilience

Adaptation Costs and Expected Benefits

The costs of the proposed activities are justified by the expected benefits to vulnerable communities and strategic economic sectors, including:

- Reduction of economic and human losses from disasters related to droughts and floods.
- Reduction of costs for disaster response.
- Improvement of water resource management.
- Improving the resilience of communities and economic sectors.
- Protection of critical infrastructure and natural resources.
- Facilitation of replicable models for other basins in both countries and at the regional level.

Panama and Costa Rica have seen an increase in environmental disasters with significant human and material losses. Panama ranks 14th in vulnerability to disasters worldwide, highlighting the need for improved risk management. Costa Rica has a modern disaster risk management framework, but still faces challenges from extreme weather events. According to the EM-DAT database, from 1970 to 2011, 69.7% of disasters in Central America have been caused by hydrometeorological events. In Panama, events such as ENSO have caused significant losses in agriculture, with economic impacts reaching USD 40 million in some years. Costa Rica also faces similar challenges, with drought and flood events exceeding its response capacities.

Sustainability and Long-Term Support

The requested funding will not only cover a portion of the immediate costs of adaptation but will also ensure the long-term sustainability of the initiatives. Monitoring and evaluation mechanisms will be implemented to ensure the effective use of funds and the continuity of adaptation measures, especially seeking advocacy at the political level and the establishment of financing mechanisms at the national level.

The governments of Panamá and Costa Rica, together with technical and financial partners, are committed to the implementation and sustainability of these measures. This project is based on the Roadmaps developed for the strengthening of hydrometeorological services between 2021 and 2023, which identified the priorities and capacities needed to face the challenges of climate change.

Benefited sectors

The economies of Panamá and Costa Rica are deeply intertwined with their natural environments, making them susceptible to climate impacts. Both countries face significant risks due to extreme hydrometeorological events, rising sea levels, and changes in rainfall patterns (droughts), which affect water availability and agricultural productivity. For example, copper mining operations, maritime facilities (particularly Panama Canal), and banana production in Panama are at risk due to extreme weather events and rising sea levels. Similarly, coffee and banana exports and high-tech manufacturing in Costa Rica depend on stable infrastructure and supply chains, which can be disrupted by hydroclimatic events.

Therefore, key sectors such as agriculture, mining, tourism, high-tech manufacturing, transboundary energy production and distribution and logistics which are vulnerable to climate change will be benefited by the project through the timely data availability and early warning systems preventing major impacts. Furthermore, the national flood and drought planning will focus on reducing vulnerability for those sectors, communities and priority basins at risk. As a result, Costa Rica and Panama will be supported with robust adaptation measures to protect their economic stability and growth.

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

One of the main objectives of the project is to ensure the sustainability of the activities once the project is completed. Component 4 is created explicitly for this purpose. Overall, the sustainability of the project will be supported by: (i) the active participation of all regional, national and local actors in the decision-making and implementation of project activities; (ii) strengthening the institutional and technical capacity of the CRRH as well as of Costa Rican and Panamanian and local actors at the basin level; (iii) increased public awareness of the benefits of planning, prevention and early warning; (iv) collecting, analysing and disseminating the results generated through the project; and (v) updating and harmonizing public policies, standards and protocols in the event of disasters caused by droughts and floods.

Regional support

Among the most influential factors in the project, in terms of sustainability, is the integration of the CRRH and GWP-CAM as project partners. Regional integration provides greater clarity, continuity and credibility to the different parties involved, including potential new investors. Likewise, knowledge is conserved and is not susceptible to loss with national changes of government or administration and, since knowledge will also be stored at the regional level, it can be supported with constant training through other regional programs once the project is completed. Finally, economies of scale are supported and the project's efforts can be replicated in the region, involving countries that have already been trained and fostering closer ties between nations in the region. For more information, see section D under "Regional Focus".

Pilot activities

Another way in which the project takes sustainability into account is through work in selected priority basins. The aim is to work with local actors so that they get involved in these activities. Basin/community-level engagement and the possible inclusion of citizen science to support hydrometeorological observations will be beneficial in supporting sustainability, as involving communities increases awareness of climate and hydrometeorological hazards, as well as integrating them into other parts of the hydrometeorological value chain in a way that better understands how the observations allow them to make informed decisions about resource management and to reduce impacts from floods and droughts. In addition, working at the local level ensures that technical knowledge reaches them and provides them with tools so that they can pass it on to more local actors. As an example: in Costa Rica it is considered that there will be access at the municipal level to a municipal risk management fund which will come from allocating municipal surpluses to disaster prevention. If municipalities are an active part of the generation of information and risk management, it will be better understood how funds can

be used for the adaptation of communities and the mechanism will be taken care of. The plans created within the framework of the project may serve as a basis for the participating municipalities to access this fund.

Institutionality

All key partners have been involved during the preparation of this concept note and the proposed activities are in line with the different national plans and strategies, as well as SICA. In this sense, institutional sustainability will be reinforced by having the main institutions involved taking ownership of the project. This appropriation is already being noticed with the efforts to create this concept note, especially with the organization of both virtual and face-to-face national consultation meetings.

Public policies and financing mechanisms

The project takes into account an extensive series of conversations that have been held with national and regional actors to identify financial and governance mechanisms that will be explored during the project in support of sustainability. Examples of these mechanisms include:

- Trust funds: made up of contributions from different sources to guarantee continuous resources for the operation and maintenance of activities.
- Royalties: pecuniary obligations linked to the provision of a specific service. As an example, in Panama, the IMHPA is financed mostly by a fee paid by the electricity transmission companies.
- Public plans and policies: once documents of this type are endorsed by governments, the allocation of resources for their implementation is facilitated.
- Political advocacy: raising awareness among the political class about the benefits provided by hydrometeorological services helps to more easily propose and approve laws and public policies that support such activities. This activity will be linked to (and will be dependent on) generating an analysis of socioeconomic benefits of the services provided with respect to hydrometeorological information, especially floods and droughts.
- Public-private partnerships: seeking this type of alliance can result in win-win where resources, experiences, capacities, etc. are shared.
- Regional alliances: during the planning and execution of the project, regional actors such as the Spanish Agency for International Development Cooperation (AECID), the IDB, WB, among others, will be consulted to analyze and identify ways to give continuity to specific project activities under programs that these actors are promoting.

As an accompaniment to the search for the implementation of the mechanisms mentioned above, national documentation on public investment will be analysed to ensure correct alignment. Some examples of the documents to be analysed are Costa Rica's National Development and Public Investment Plan 2023-2026 (PNDIP), Panama's Public Investment Plan 2025-2029 and their respective General Methodology Guide for the Formulation and Evaluation of Public Investment Projects, which prioritize aspects such as adaptation and climate change.

Sustainability and scalability

The project's architecture is explicitly designed to serve as a scalable blueprint for the wider Central American region. Scalability will be achieved through a three-pronged approach:

- Horizontal Replication in Companion Catchments: The modular nature of the EWS frameworks deployed in the Tempisque, Pirris-Parrita-Candelaria, La Villa, and Tonosí basins allows for rapid transposition to neighbouring catchments. By documenting the deployment methodologies of HydroSOS and HydroBID as standardized toolkits, the executing national agencies (IMN, IMHPA) can replicate these systems across other climate-stressed domestic watersheds with minimal structural adjustments.
- Vertical Institutionalization and Policy Integration: The project moves beyond isolated project-based interventions by embedding its outputs into national legislative frameworks. The binational protocols developed for the Sixaola basin will provide an updated, legally binding model for transboundary water governance that can be adopted by other SICA member nations sharing border watersheds (such as the Lempa River Basin). National drought and flood plans generated under Component 2 will be structurally linked to national budgets, ensuring long-term institutional ownership.
- Financial Scalability and Innovative Mechanisms: To transition from grant-based project funding to self-sustaining operational models, the project will actively explore the capitalization of regional climate finance instruments, such as:

- o Public-Private Partnerships (PPPs): Engaging major water users—such as agro-industrial enterprises, hydropower operators (including ICE), and tourism boards—to co-finance the maintenance of hydroclimatic monitoring networks that directly de-risk their commercial operations.
- o National Trust Funds: Working with national environmental funds to earmark water tariff revenues explicitly for the operation and maintenance (O&M) of local EWS.
- o Regional Blended Finance: Utilizing CRRH-SICA's institutional positioning to aggregate water security metrics, allowing member states to jointly leverage larger-scale multilateral funds (such as the Green Climate Fund) for full-scale infrastructural expansions across Central America

A summary of such elements is presented in Tab. 6.

Tab. 6. Elements of sustainability and scalability

Elements of sustainability	Elements of scalability	Comments on scalability
Strengthening institutions and building capacity	Development of standardized methodologies, protocols, operational processes, products, and hydrometeorological and early warning services embedded within national and regional institutions	Institutional ownership ensures continuity of operations and maintenance beyond AF funding. Standardized approaches allow replication and extension to additional territories and hazards within similar institutional arrangements across Central America.
Integrating adaptation measures into public policies and governance systems	Integration of project outputs into national adaptation plans, climate policies, disaster risk management frameworks, and sectoral governance systems	Policy integration enables allocation of public resources and facilitates scaling through national budgetary processes and follow-on climate and development finance. Post-project monitoring and evaluation mechanisms support learning and replication.
Exploring innovative financing mechanisms (PPPs, trust funds, insurance, etc.)	Legal, financial, and institutional mechanisms combining public finance, climate finance, private sector engagement, and risk-sharing instruments	Testing and piloting innovative financing approaches enables adaptation of these mechanisms to wider national contexts and similar socio-economic conditions in other Central American countries, reducing reliance on grant-based financing.
Regional cooperation and alliances	Strengthening of regional institutional arrangements (e.g. SICA) and shared platforms, standards, and services	Regional cost-sharing and coordination reduce marginal costs of expansion and facilitate replication of the model across Central America through existing regional mechanisms.
Development of interoperable systems and shared regional services	Regional platforms and data exchange systems designed as regional public goods	Interoperable systems allow new countries or institutions to join without redesign, supporting horizontal scaling across the region.
Human capacity development and knowledge retention	Training-of-trainers, regional learning networks, and transferable knowledge products	Human capacity acts as a multiplier for scaling, enabling expansion of services without proportional increases in external technical assistance.
Alignment with future climate and development finance	Project design aligned with requirements of multilateral climate funds and development banks	AF financing acts as a catalytic investment that prepares institutions and systems for larger-scale investments, supporting vertical scaling through significantly larger funding envelopes.
Sustained service delivery to vulnerable populations	People-centred and gender-responsive approaches integrated into service design	Demonstrated social relevance and effectiveness increase political and financial support for expansion and replication beyond the project lifetime.

Sustainability will be reinforced through the integration of systems into NMHS operational mandates, interoperable regional platforms coordinated by CRRH, incorporation of methodologies into national drought and flood management plans, long-term capacity development, and operational procedures aligned with WMO standards. The project also supports future scalability by developing standardized methodologies, open-source tools, regional cooperation mechanisms, and replicable basin-level experiences that can be expanded to additional territories and countries through future investments and partnerships.

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

The project will operate in Costa Rica and Panama, countries with legal and institutional frameworks promoting gender equality and social inclusion. However, structural inequalities persist that may affect equitable access to project benefits, particularly among rural women, Indigenous Peoples, Afro-descendant communities and other vulnerable groups exposed to recurrent droughts and floods. Key social risks identified include unequal access to hydrometeorological information, limited participation in technical and decision-making spaces, digital gaps, and socioeconomic barriers that may reduce adaptive capacity and access to climate services and early warning systems.

Women in both countries play a central role in water management, food security and community resilience, yet remain underrepresented in hydrometeorological and STEM-related sectors. In Panama, these challenges are particularly evident in rural areas and Indigenous Comarcas exposed to extreme hydrometeorological events.

From an environmental perspective, the project is expected to generate predominantly positive impacts through strengthened monitoring systems and improved climate risk management. Minor and temporary environmental risks associated with the installation and modernization of hydrometeorological infrastructure may include localized disturbances, electronic waste management and site-specific impacts. These risks will be mitigated through appropriate environmental procedures, compliance with national regulations and good installation practices.

To address these risks, the project will implement participatory, inclusive and gender-responsive approaches across all components, including inclusive consultation mechanisms, targeted capacity-building activities, sex-disaggregated indicators and Gender Action Plans under Component 4, ensuring equitable access to project benefits and strengthening inclusive climate resilience.

A preliminary assessment conducted at the concept note stage (Tab. 7) classified the project in Category C since the project is not expected to generate any adverse environmental or social impacts.

Tab. 7. Quick screening of the environmental and social policy principles of the Adaptation Fund.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>		This will be further evaluated during the Environmental and social impact assessment (ESIA).
<i>Access and Equity</i>		The project will only be able to engage a small group of members in the different communities. It is expected that the knowledge derived from these groups can be transmitted to the rest of the community. This will be further evaluated during the Environmental and social impact assessment (ESIA).
<i>Marginalized and Vulnerable Groups</i>		There is a risk that vulnerable and marginalized groups will have insufficient knowledge and access to technology. To avoid the exclusion of marginalized and vulnerable communities, traditional practices will be implemented to reach these groups especially women, girls, elderly, physically challenged individuals. An assessment on ensuring marginalized and vulnerable groups participation will be performed.
<i>Human Rights</i>	√	
<i>Gender Equity and Women's Empowerment</i>		The proposed activities will seek access to information and co-development ensuring gender equity. A more detailed gender assessment will be performed
<i>Core Labour Rights</i>	√	
<i>Indigenous Peoples</i>		All population groups in the area will be consulted and involved during the design and implementation of the project activities, including indigenous and afro-descendant

		communities. An analysis will be carried out, in order to understand the traditional knowledge with regards to climate, water and land.
<i>Involuntary Resettlement</i>		No direct involuntary resettlement will result from proposed project activities. The project will provide best practices for resettlement in terms of policies and measures in case the governments seeks such approach to reduce risk. This will be further evaluated during the Environmental and social impact assessment (ESIA).
<i>Protection of Natural Habitats</i>		There are no potential direct risks to the protection of ecosystems, their natural habitats and biological diversity through project activities. This will be further evaluated during the Environmental and social impact assessment (ESIA).
<i>Conservation of Biological Diversity</i>		
<i>Climate Change</i>	√	
<i>Pollution Prevention and Resource Efficiency</i>		An assessment on disposing of waste from hydromet networks will be considered as part of an Operations and Maintenance (O&M) strategy in Output 1.1.1
<i>Public Health</i>		This will be further evaluated during the Environmental and social impact assessment (ESIA).
<i>Physical and Cultural Heritage</i>		Some of the priority basins include natural heritage sites. This will be further evaluated during the Environmental and social impact assessment (ESIA).
<i>Lands and Soil Conservation</i>		Countries have expressed their utmost concern about land and soil conservation and will advocate for policies that support conservation practices based on resulting hydrometeorological products. Such policies will be developed during the project. This will be further evaluated during the Environmental and social impact assessment (ESIA).

PART III: IMPLEMENTATION ARRANGEMENTS

WMO will be the implementing entity for the project. In this sense, it will be responsible for the functions of general management, as well as issuing the necessary guidelines, monitoring compliance with the technical and financial aspects of the project, and supervising the project in general. It will also ensure the alignment of results with global initiatives. Such is the case of the EW4All initiative, where the WMO will coordinate with the institutions involved (UNDRR, IFRC, ITU) to ensure that the EWS are addressed in a systemic manner.

For the above purposes, it will rely on its extensive network of experts, as well as WMO constituent bodies such as the technical commissions, the research council and the regional association for North America, Central America and the Caribbean (RA IV), ensuring compliance with international standards and guidelines, also following guidelines established by the region and making available the best practices and recommendations necessary for the success of the project. WMO will also coordinate any interaction with strategic partners such as the IDB, The Global Mechanism of the United Nations Convention to Combat Desertification (UNCCD), and donors in other projects.

The overall execution of the project will depend mainly on the CRRH, in conjunction with WMO and GWP, who will carry out those activities that are closely related to their technical programmes and regional and global initiatives, thus providing added value. They will rely in additional technical partners when necessary.

The executing agencies of the project will be responsible for executing the activities in accordance with the directives of the countries in line with the project, including the preparation of technical specifications and terms of reference, technical, financial and execution reports, and carrying out procurement and contracting. A brief description of the executors is:

- WMO is the authoritative voice of the United Nations system on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources, and contributes to improving hydrological services in its Member countries through a number of initiatives. In addition, WMO is leading

Pillar 2 of the EW4All initiative, "Risk Detection, Observation, Monitoring, Analysis and Forecasting". As such, this project will align with this and other WMO initiatives.

- The CRRH, as a SICA agency specialized in water, weather and climate issues, and with 59 years of uninterrupted operation, is a central element, together with the NMHS, that will contribute to the coordination and unification of national results, to an adequate implementation of the regional component and to save the knowledge and lessons learned for future use and/or replication in the region, giving continuity to the training efforts carried out within the project. The CRRH will serve as a liaison with other SICA agencies, such as the Coordination Centre for Disaster Prevention in Central America and the Dominican Republic (CEPREDENAC) and the Central American Commission for Environment and Development (CCAD).
- The Global Water Partnership (GWP) is a multilateral action network of more than 2,800 partner organizations from more than 180 countries dedicated to working for equitable and efficient water resources management 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 on a regional and national scale through its 13 Regional Water Partnerships (RWPs). GWP Central America (GWP-CAM) is one of these RWPs, based in Honduras, with 155 partners in the region and National Water Associations 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 in the implementation of integrated drought management by providing policy, technical and management guidance and sharing scientific knowledge and best practices. It also maintains close coordination with the national institutions that govern water/climate management, as well as coordination agreements with SICA instances, such as the CRRH.

The CRRH will lead Components 1, 2 and 3 and will integrate and manage a Project Execution Unit (PEU), in charge of the procurement and contracting processes, as well as the integration of technical and management reports, in addition to ensuring and supporting the correct development of the project in a timely manner. To this end, it shall maintain a close relationship and coordination with the other implementers (WMO and GWP), as well as with the NMHSs and, through them, with the different counterparties and final beneficiaries in each case. The PEU will be composed of a regional coordinator and national technical specialists who will follow up on the activities to be implemented and will be the focal point for each country, hired by CRRH and the NMHSs respectively.

The GWPO, through their regional representative GWP-CAM will lead the implementation of Component 4, in coordination with WMO and the CRRH. In addition, it will provide support in terms of training and technical assistance, support capacity building activities, the preparation of policy instruments, the inclusion of the gender approach and the use of existing networks to facilitate the participation of stakeholders in the water sector and water-related sectors. This will contribute to the spread of the benefits of the project in both countries and ensure that the project activities are closely linked to national needs and contexts, while maintaining the benefits of a regional approach.

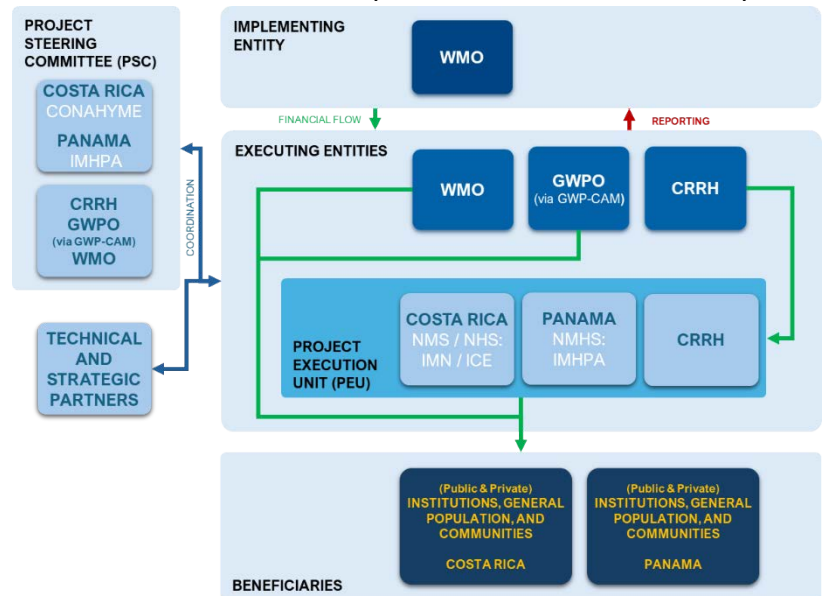
The agreements and mechanisms already established and in force between the different executors and with the different countries linked to inter-institutional coordination and project implementation will be used. Where appropriate, the CRRH has already established mechanisms and protocols that facilitate the coordination and implementation of multilateral funds with multiple beneficiaries.

At the national level, NMHSs (IMN and ICE in the case of Costa Rica and IMHPA¹⁷ in the case of Panama) will be responsible for coordinating with other national institutions (e.g. Climate Change Directorates and Civil Protection Services), ensuring the effective implementation of activities on the ground with the assistance of CRRH, WMO and GWP-CAM technical experts, as well as WMO technical units. To facilitate the development of activities at the national level and ensure their harmonization, it is envisaged that NMHSs will establish a national execution team (including the specialists who will be part of the PEU). This team will consider the creation of working groups for the different areas of the project as needed, including for activities at the local level (priority basins), where local communities (particularly through their basin organization) will play a key role in ensuring ownership of the pilot activities in the project and data collection. The General Directorates of the NMHS will be supported for the execution of the project by the PEU,

Fig. 6. Diagram of the project execution. structure

which will be created for the purposes. A Project Steering Committee (PSC) will be created, whose role will be to oversee and validate the implementation of project activities in line with the expected results. It will be composed of representatives of the implementer, executing partners and NMHSs of both countries. The representatives of the NMHS of both countries will oversee informing their respective boards of directors and/or committees (IMHPA Board of Directors and CONAHYME) about the progress of the project.

Strategic and Technical partners will be sought and identified throughout the project, according to the activities, especially related to public policies, governance and socio-economic benefit analysis. One of these strategic partners will be the IDB, which will provide advice on financial sustainability after the project is completed and other activities within its competence in the areas of climate change and water and sanitation. Another will be the UNCCD, which provides technical and strategic support in the preparation of the project, including South-South cooperation, and financial sustainability planning.



The diagram that outlines the implementation structure of the project can be seen in .

Budget

The total budget of the project is estimated at USD 22,859,155, from which USD 18,956,000 are activity costs, USD 1,825,050 are execution costs (see table below), and USD 2,078,105 are implementing fees (10% of activities costs + execution costs). A detailed budget including budget notes and disbursement schedule will be presented during the proposal development stage. The approximate distribution of the total costs during the project period is as follows in Tab. 8.

Tab. 8. Funds distribution.

Executing Entity	Cost of activities	Execution costs	Beneficiary	Amount
CRRH	USD 16,986,000	USD 1,698,600 (10% of activities)	Costa Rica	USD 8,807,000
GWPO	USD 1,140,000	USD 114,000 (10% of activities)	Panama	USD 8,807,000
WMO	USD 830,000	USD 12,450 (1,5% of activities)	Regional/Transboundary	USD 1,342,000

¹⁷ In consideration of the mandates and installed capacities, the institutional framework of the IMHPA, (Law 209 of April 22, 2021 and regulated by Executive Decree 2 of March 7, 2022), directing the technical and administrative tasks of the IMHPA necessary for the proper performance of the functions of the Institute is one of the functions of the General Directorate. Consequently, for the purposes of this Project, it is the responsibility of the General Directorate or whoever it designates, to be the liaison with the beneficiary institutions and the decision-making for the execution and implementation of the project. In the event of requiring approval by the IMHPA Board of Directors through a Board of Directors Resolution, the General Directorate will be responsible for this procedure.

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

The objective of the project is to improve climate change adaptation capacity and resilience to droughts and floods in Central America through the strengthening of hydroclimatic and early warning systems and the integration of the knowledge generated in the planning and management of national and regional water resources. This gives the countries the capability to manage and adapt to climate-related risks. The Adaptation Fund Results Framework Outcomes 1, 2, 3, 4, 7 and 8 are covered by the project (although Outcomes 5 and 6 might also be indirectly covered through policies and plans depending on specific results of some activities). Tab. 9 provides the links between each component, outcome and output and the Adaptation Fund's Results Framework.

Tab. 9. Alignment of the project components, outcomes and outputs with the Results Framework of the Adaptation.

Project Component (s) ¹⁸	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Component 1. Hydrometeorological observing, monitoring, and data management infrastructure improved for risk awareness and Early Warnings Outcome: Reliable and Accessible Hydrometeorological Data and Information Systems Operational	To be defined in the project proposal phase	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. Capacity of staff to respond to, and mitigate impacts of, climate related events from targeted institutions increased	8,866,000
		Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.1. Responsiveness of development sector services to evolving needs from changing and variable climate	
		Outcome 8: Support the development and diffusion of innovative adaptation practices, tools and technologies	8. Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level	
Component 2. Institutional set-up and processes for risk knowledge and Early Warning Outcome: Enhanced Risk Knowledge and Functional Early Warning Systems Operational	To be defined in the project proposal phase	Outcome 1: Reduced exposure to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	4,490,000
		Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. Capacity of staff to respond to, and mitigate impacts of, climate related events from targeted institutions increased	
		Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.1. Responsiveness of development sector services to evolving needs from changing and variable climate	
Component 3. Flood and drought management and risk mitigation enhancement from regional to local level Outcome: Strengthen Institutional Capacity and coordination for Integrated	To be defined in the project proposal phase	Outcome 1: Reduced exposure to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	3,620,000
		Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. Capacity of staff to respond to, and mitigate impacts of, climate related events from targeted institutions increased	
		Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	

¹⁸ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

Project Component (s) ¹⁸	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Flood and Drought Management			3.2. Percentage of targeted population applying appropriate adaptation responses	
Component 4. Enabling environment for building resilience to floods and droughts Outcome: Enabling Policy, Institutional, and Capacity Environment Established	To be defined in the project proposal phase	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. Capacity of staff to respond to, and mitigate impacts of, climate related events from targeted institutions increased	1,980,000
		Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
		Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7. Climate change priorities are integrated into national development strategy	
		Outcome 8: Support the development and diffusion of innovative adaptation practices, tools and technologies	8. Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level	
Project Outcomes(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
1.1 Integrated observation, monitoring and data management systems provide inputs for risk knowledge and Early Warning	To be defined in the project proposal phase	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	7,350,000
		Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated	
1.2 Hydrometeorological and climate data at national and regional scales available for product and service generation	To be defined in the project proposal phase	Output 2.1: Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events	2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	1,516,000
		Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated	
2.1 Enhanced and sustained mechanisms for flood and drought risk knowledge for use by communities and users	To be defined in the project proposal phase	Output 1.1: Risk and vulnerability assessments conducted and updated	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale)	870,000
2.2 Enhanced and sustained hydrometeorological forecasting available to communities and users	To be defined in the project proposal phase	Output 2.1: Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events	2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	1,620,000
2.3 Dissemination of flood and drought alerts available to communities and users	To be defined in the project proposal phase	Output 1.2: Targeted population groups covered by adequate risk reduction systems	1.2 No. of early warning systems (by scale) and no. of beneficiaries covered	2,000,000
		Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.1. No. and type of development sector services modified to respond to new conditions resulting from climate variability and change (by sector and scale)	

Project Component (s) ¹⁸	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
3.1 Strengthened regional coordination of flood and drought management and policy	To be defined in the project proposal phase	Output 2.1: Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)	1,230,000
3.2 Users make decisions based on established national planning for flood and drought and response capacity for communities is strengthened	To be defined in the project proposal phase	Output 2.1: Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender) 2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	590,000
3.3 Vulnerable communities more resilient against flood and drought	To be defined in the project proposal phase	Output 1.2: Targeted population groups covered by adequate risk reduction systems Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	1.2 No. of early warning systems (by scale) and no. of beneficiaries covered 3.1.1 No. of news outlets in the local press and media that have covered the topic 3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge 3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	1,800,000
4.1 Enhanced governance framework and gender mainstreaming for integrated drought and flood management	To be defined in the project proposal phase	Output 2.2: Increased readiness and capacity of national and sub-national entities to directly access and program adaptation finance Output 7: Improved integration of climate-resilience strategies into country development plans	2.2.1 No. of targeted institutions benefitting from the direct access and enhanced direct access modality 7.1. No. of policies introduced or adjusted to address climate change risks (by sector) 7.2. No. of targeted development strategies with incorporated climate change priorities enforced	400,000
4.2 Enhanced institutional capacity and stakeholders' awareness for integrated drought and flood management	To be defined in the project proposal phase	Output 2.1: Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender) 2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale) 3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge 8.2. No. of key findings on effective, efficient adaptation practices, products and technologies generated	1,580,000

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

A. Record of endorsement on behalf of the government¹⁹

The endorsement letters should be attached as an annex to the project/programme proposal.

H.E. Mónica Navarro Del Valle Ministra Ministerio de Ambiente y Energía Email: vicegestionestrategica@minae.go.cr , cambioclimatico@minae.go.cr COSTA RICA	Date: 22 June 2026
Mr. Juan Carlos Monterrey Director of Climate Change Ministry of Environment Email: jmonterrey@miambiente.gob.pa , acardenas@miambiente.gob.pa PANAMA	Date: 01 July 2025

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 (Costa Rica: "Política Nacional de Adaptación al Cambio Climático 2018-2030" and "Plan Nacional de Adaptación al Cambio Climático de Costa Rica 2022-2026"; Panama: "Plan Nacional de Adaptación (NAP)" and "Plan Nacional de Acción Climática (PNAC)") and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> 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, WMO	
Date: July 2026	Tel. and email: +4122 730 8646 mchaponda@wmo.int
Project Contact Person: Federico Gómez-Delgado	
Tel. And Email: +506 22 58 23 70 fgomez@wmo.int	

¹⁹ 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.



San José, July 22, 2026

CARTA-MINAE-DM-394-2026

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

Subject: Endorsement for the Concept note of the project “Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Improving Hydroclimatic and Early Warning systems and integrating with Water Resources Management”.

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

Accordingly, I am pleased to endorse the aforementioned project proposal with the support of the Adaptation Fund. If approved, the project will be implemented by the World Meteorological Organization (WMO) and executed by this same entity, the Global Water Partnership Organization (GWPO) and the Regional Committee for Hydraulic Resources of the Central American Integration System (CRRH-SICA).

Thank you.
Yours faithfully,



Mónica Navarro Del Valle, LL.M., M.B.A.
Minister of Environment and Energy, Republic of Costa Rica

C. Consecutive/File/Reference DCC-086-2027

CAP

CC:

Rubén Muñoz Vargas, Director of International Cooperation, MINAE.
Adriana Bonilla Vargas, Director of Climate Change, MINAE.

Carta de Endoso del Gobierno

Panamá, 1 de julio de 2025
DCC-416-2025

Para: La Junta del Fondo de Adaptación
c / o secretaria del Fondo de Adaptación
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

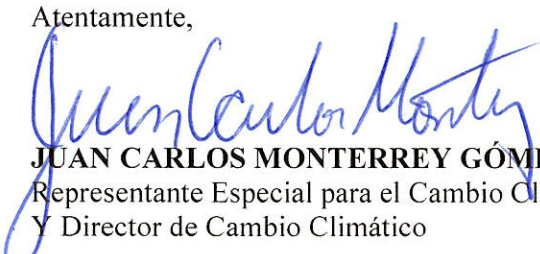
Asunto: Aprobación de la propuesta: "Fortalecimiento de la capacidad de adaptación al cambio climático en América Central, con especial atención en Costa Rica y Panamá: Perfeccionamiento de los sistemas hidroclimáticos y de alerta temprana y su integración para la gestión de los recursos hídrico".

En referencia a la carta DM-N-1134, de fecha 4 de diciembre de 2024, como Autoridad Designada para el Fondo de Adaptación de la República de Panamá, apruebo presentar la nota conceptual para el proyecto regional **"Fortalecimiento de la capacidad de adaptación al cambio climático en América Central, con especial atención en Costa Rica y Panamá: Perfeccionamiento de los sistemas hidroclimáticos y de alerta temprana y su integración para la gestión de los recursos hídrico"**. La propuesta está totalmente alineada con las prioridades nacionales y regionales del gobierno en la implementación de actividades de adaptación para reducir los impactos adversos y los riesgos que representan las inundaciones y sequías en el país.

La presente es también para expresar el consentimiento del gobierno en la implementación del proyecto arriba mencionado por parte del Comité Regional para los Recursos Hídricos (CRRH), la Asociación Mundial para el Agua (GWP), la Organización Meteorológica Mundial (OMM); y la implementación local bajo el Instituto de Meteorología e Hidrología de Panamá IMHPA en estrecha colaboración con el Ministerio de Ambiente de Panamá.

Aprovecho la oportunidad para reiterarle el testimonio de mi más distinguida consideración

Atentamente,


JUAN CARLOS MONTERREY GÓMEZ
Representante Especial para el Cambio Climático
Y Director de Cambio Climático

JCM/km
km.



Letter of Endorsement by Government

Panama, July 1st, 2025
DCC-416-2025

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

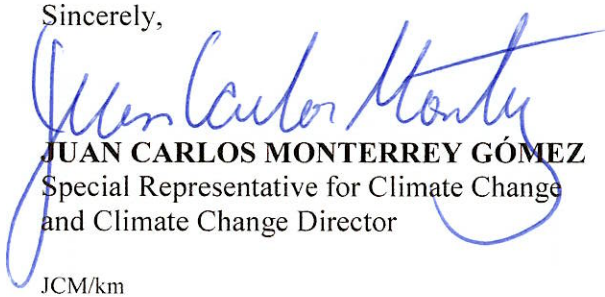
Subject: Endorsement letter for the Concept Note of the proposal “Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Improving Hydroclimatic and Early Warning systems and integrating with Water Resources Management”.

Referring to the letter DM-N-1134, dated December 4, 2024, as Designated Authority for the adaptation fund, I hereby endorse to submit the concept for the regional project **“Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Improving Hydroclimatic and Early Warning systems and integrating with Water Resources Management”**. The proposal is fully aligned 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.

This is also to express the consent of the government in the implementation of the above-mentioned project by the Regional Committee for Water Resources (CRRH), Global Water Partnership (GWP), World Meteorological Organization (WMO); and the local implementation of the Institute of Meteorology and Hydrology of Panama (Instituto de Meteorología e Hidrología de Panamá IMHPA) in close collaboration with the Ministry of Environment of Panama.

Please accept the assurances of my highest consideration.

Sincerely,


JUAN CARLOS MONTERREY GÓMEZ
Special Representative for Climate Change
and Climate Change Director

JCM/km





Revised PFG Submission Form¹
Project Formulation Grant (PFG)

Submission Date: 20 July 2026

Adaptation Fund Project ID: AF00000398

Country/ies: Costa Rica, Panama

Title of Project/Programme: Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Improving Hydroclimatic and Early Warning systems and integrating with Water Resources Management

Type of IE (NIE/RIE/MIE): Multilateral Implementing Entity

Implementing Entity: World Meteorological Organization (WMO)

Executing Entity/ies: Regional Committee for Water Resources (CRRH), Global Water Partnership (GWP) and WMO

A. Project Preparation Timeframe

Start date of PFG	Oct 2026
Completion date of PFG	Sep 2027

B. Proposed Project Preparation Activities (\$)

List of Proposed Project Preparation Activities	Output of the PFG Activities	US\$ Amount	Budget note
1. Technical assistance for integration of full project proposal	Final full Project proposal is available	\$30,000	Hiring of experts to prepare proposal and institutional & community-based consultation meetings. (Rate of 500 USD per day, up to 60 days)
2. Country consultations	Onsite consultations with counterparts at the national and basin levels are carried out and informed the project proposal	\$60,000	Carrying out institutional and community-based consultations (Necessary institutional agreements, workshop-related costs including

¹ As presented in AFB/PPRC.33/40 Annex 1.

			venues, materials, tools, etc., and travel expenses)
3. Environmental and Social risk Management Plan	Environmental and social risk management plan is available and included in the project proposal	\$22,150	Hiring of experts with experience in conducting EIA and SIA studies (Rate of 500 USD per day, up to 60 days)
Administration Support (7% Implementing Entity Fee)		\$7,850	Lumpsum for coordination and administrative expenses
Total Project Formulation Grant		US\$ 120,000	

Please describe below each of the PFG activities and provide justifications for their need and for the amount of funding required:

Activity 1. Technical assistance for integration of full project proposal. Drafting of a project proposal with the information available, and integration of a full project proposal based on the information and results of consultation workshops and additional assessments. This activity includes the preparation of a plan, an information base, and the necessary materials (presentations, graphs, diagrams, etc.) for the development of consultations with counterparts in each country.

Activity 2. Country consultations. Conducting and facilitating (together with staff from the different executing agencies) various consultations and interactions with counterparts in both countries, in order to integrate a document of conclusions and additional relevant information to understand all counterparts expertise, experience, and identify local stakeholders and beneficiaries, available resources and services, communication channels etc. Letters of Agreement (LoA) will be formalised, as required, with the countries for such purposes, as well as coverage of travel expenses for participants, consultants, and staff of the executing agencies. These expenses include the necessary consultations for EIA and SIA.

Activity 3. Environmental and Social Risk Management Plan. Conducting EIA and SIA studies with consultations of relevant stakeholders at regional, national and local levels. The draft EIA and SIA will be validated through national/regional workshop to get endorsement of relevant of stakeholders.

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,	Project Contact Person	Telephone	Email Address
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		day, year)			
Moyenda Chaponda	<i>Moyenda Chaponda</i>	20 July 2026	Federico Gómez- Delgado	+50622582370	fgomez@wmo.int

Annex 1 – Analysis of the selected priority basins for the project

Based on an analysis carried out by the main counterparts in Costa Rica (IMN and ICE) and Panama (IMHPA), the basins were prioritized in each case in order to identify those with the greatest feasibility of being selected for the execution of the pilot activities considered in the project.

The analysis carried out took into consideration several aspects, among which are:

- Historical impacts of droughts and floods on watersheds (loss and damage).
- Frequency of affectations
- Equipment deployed in the basin and information, studies, etc., that allow the development of information and services from these
- Potential for sustainability of the system over time, based on the main productive activities of the basin
- Basic basin governance
- Identification of sectors benefiting from information and knowledge
- Political importance and institutional visibility that the project would generate

The basins proposed for each case were finally reviewed and agreed upon in the context of the national consultation workshops that were held from February 11 to 14 in San José, Costa Rica, and from February 17 to 20, in Panama, Panama. In the case of Costa Rica, the validation was done with the institutions of CONAHYME and the CNE, while in Panama the validation was done with several actors related to the use of hydrometeorological information provided by the IMHPA (MiAmbiente, MIDA, ACP, IDAAN, SINAPROC, among others).

A detailed annex on the different conditions and selection of the basin will be made available in the full project proposal. A summary table is available here:

Country	River Basin	Area Km2	Climate	Rainfall mm	Rainiest Months	Average Temperature (°C)	Main economic activities
Costa Rica	Tempisque	3382,07	Premontane tropical humid forest	1500 - 4000	September October	22 - 24	Agriculture (sugarcane, rice, grass, melon and watermelon); Livestock
	Pirris Parrita Candelaria	1273,35	Humid forest	1500 - 3000	May November	16 - 18	Agriculture (African palm, rice, pineapple); Livestock
Panama	La Villa	1284,3	Tropical Savannnah	1054	September November	27	Agriculture (Rice, corn, sugarcane); Livestock
	Rio Tonosi	1355	Humid Tropical	2220	September November	24 - 32	Agriculture (Rice); Livestock
Transboundary	Sixaola	2839,6	Humid Tropical	1500 - 3550	September October	22 - 28	Agriculture and Livestock

Annex 2 – References

- [1] World Meteorological Organization (WMO, 2024). *State of the Global Climate 2023*. (WMO-No. 1347). Geneva 2024.
- [2-1.B] World Meteorological Organization (WMO, 2024). *State of Global Water Resources report 2023*. (WMO-No. 1362). Geneva 2024.
- [3] World Meteorological Organization (WMO, 2024). *Estado del clima en América Latina y el Caribe 2023*. (WMO-No. 1351). Geneva 2024.
- [4-2.B] World Meteorological Organization (WMO, 2024). *Estado del clima en América Latina y el Caribe 2023*. (WMO-No. 1351). Geneva 2025.
- [5] The Intergovernmental Panel on Climate Change (IPCC, 2023). *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J. Romero (eds.)]. Geneva 2023.
- [6] Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, (Castellanos et al, 2022): *Central and South America. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, 2022.
- [7] Camila I. Donatti, Kristina Nicholas, Giacomo Fedele, Damien Delforge, Niko Speybroeck, Paula Moraga, Jamie Blatter, Regina Below, Alex Zvoleff (Donatti et al., 2024). *Global hotspots of climate-related disasters*, International Journal of Disaster Risk Reduction, Volume 108, 2024. (<https://www.sciencedirect.com/science/article/pii/S2212420924002504>).
- [8] EM-DAT (2023). CRED/UCLouvain. *Base de datos de desastres relacionados con el clima 1994-2022*. Brussels 2023. (<https://www.emdat.be>)
- [9] The International Bank for Reconstruction and Development / The World Bank and Columbia University (World bank 2005). *Natural Disasters Hotspots. A Global Risk Analysis*. Maxx Dilley, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam, and Margaret Arnold with Jonathan Agwe, Piet Buys, Oddvar Kjekstad, Bradfield Lyon, and Gregory Yetman. Disaster Risk Management Series. Washington, DC 2005.
- [10] Iniciativa INFRA LATAM. Datos de inversión pública en infraestructura económica en America Latina y el Caribe. Descargada en abril de 2023 (<http://infralatam.info>)
- [11] World Meteorological Organization (WMO, 2023). *La iniciativa Alertas Tempranas para Todos se amplía a fin de materializarla sobre el terreno*. Nota de Prensa 21032023. (<https://public.wmo.int/es/media/comunicados-de-prensa/la-iniciativa-alertas-tempranas-para-todos-se-amplia-fin-de>)
- [12] World Meteorological Organization (WMO, 2022). *Early Warnings for All. Executive Action Plan 2023-2027* (The UN Global Early Warning Initiative for the Implementation of Climate Adaptation). Geneva 2022.
- [13] United Nations Office for Disaster Risk Reduction and World Meteorological Organization. *Global Status of Multi-Hazard Early Warning Systems*. Geneva 2023.
- [14] Global Commission on Adaptation (2019). *Adapt now: A global call for leadership on climate resilience*.

Annex 3 – Initial Consultation Report

The full Initial Consultation Report, which contains the English narrative summaries together with the original national consultation reports for Panama and Costa Rica (in Spanish), is provided as a [separate annex document](#) to this Concept Note.

Initial stakeholder consultations were conducted at two moments of the Concept Note preparation. In Panama, a national consultation workshop for the Tonosí and La Villa river basins was held on 17 and 18 February 2025 at the Ascanio Arosemena Center of the Panama Canal Authority, gathering 47 participants (22 women and 25 men) from 14 public and non-governmental entities. In Costa Rica, virtual consultation workshops for the Tempisque and Parrita-Candelaria river basins were held on 29 June and 1 July 2026, engaging 36 key stakeholders from the water, productive, academic and institutional sectors.

The key findings of the consultations, and their implications for the design of the project, are the following:

Validation of the approach. Stakeholders in both countries broadly validated the relevance and urgency of the project, in particular its integrated basin management approach, its multi-sectoral character and the emphasis on monitoring, forecasting and early warning systems.

Water security. Participants in Costa Rica called for a more explicit incorporation of water supply for human consumption, ecosystem protection and environmental flows as central elements of water management, reinforcing an integral water security approach beyond productive uses.

Data accessibility and last-mile communication. While institutions hold substantial hydroclimatic data, challenges persist in their integration, accessibility and use; information must be translated into clear, timely and practical products for end users, especially producers and communities.

Governance and inter-institutional coordination. The basin approach, although widely supported, still faces implementation limitations; more effective articulation mechanisms are needed to integrate efforts, avoid duplication and maximize impact. In Panama, IMHPA was positioned as the leading entity for the generation, integration and dissemination of hydro-climatic information.

Anticipatory risk management. Drought and flood management must be anticipatory rather than reactive, and warning systems must consider longer productive cycles, particularly in agriculture and livestock.

Territory-based solutions. Local experiences with sustainable soil management, infiltration techniques and adaptive productive models were highlighted as essential complements to technical systems, supporting the project components on basin pilots and nature-based solutions.

Basin prioritization. The Panama consultation confirmed the selection of the Tonosí and La Villa river basins on the grounds of their high vulnerability to floods and droughts, the recurrence of extreme events and their socioeconomic relevance.

Cross-cutting approaches. Stakeholders underscored the importance of gender, community participation and attention to vulnerable groups, as well as of ensuring sustainability through technical capacities, quality of infrastructure and data, and alignment with existing public policies.

Note: These consultations correspond to the Concept Note stage. During the preparation of the fully developed proposal, the same institutions will be consulted again, together with vulnerable groups, basin committees and specific beneficiary sectors, in order to validate and further develop the design of project activities.

Annex 4 – Initial Gender Assessment

The full Initial Gender Assessment, which contains an English summary together with the original extended gender note for Costa Rica and Panama (in Spanish), is provided as a [separate annex document](#) to this Concept Note.

The assessment is a desk-based legal and documentary analysis of the normative frameworks, institutional arrangements and key gender-related data of both countries, which underpins the gender sections of this Concept Note. Its main findings are the following:

Normative and institutional frameworks. Both countries have ratified the main international instruments on gender equality (CEDAW, the Pact of San José and the Belém do Pará Convention) and are covered by the SICA Regional Policy on Gender Equality and Equity (PRIEG/SICA). Costa Rica counts on a broad national framework (PLANOVI 2017-2032, PIEG, Laws 8805 and 10235) led by the National Institute for Women (INAMU); Panama has likewise developed extensive legislation (Law 4 of 1999, Law 82 of 2013, Law 56 of 2017) and elevated its national women's institute to the Ministry of Women in 2023.

Persistent gaps. According to the Global Gender Gap Index, Costa Rica ranked 14th globally in 2023 (score 0.793) and 19th in 2024 (0.785), while Panama ranked 58th in 2023 and 50th in 2024 (0.742). In Costa Rica, women's employment rate (47%) remains 26 percentage points below that of men (73%), and women devote approximately 23 more hours per week to unpaid domestic and care work. In Panama, women remain underrepresented in decision-making positions, and indigenous and Afro-descendant women face compounded vulnerabilities.

Implications for the project. These findings confirm that gender differences significantly influence adaptive capacity to climate change, particularly in rural contexts and river basins. They inform the gender-responsive design of the project, including the development and implementation of gender action plans, indicators and targeted training (output 4.1.3).

Note: In line with the Adaptation Fund Gender Policy, a full gender assessment and gender action plan will be prepared, using participatory and gender-responsive methods, during the development of the fully developed proposal.

Full report referenced in Annex 3 of the Concept Note

INITIAL CONSULTATION REPORT

Adaptation Fund Regional Project: Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Enhancement of Hydroclimatic and Early Warning Systems and their Integration for Water Resources Management

Prepared by the Regional Committee on Water Resources of the Central American Integration System (CRRH-SICA), with support from the Instituto de Meteorología e Hidrología de Panama (IMHPA), the World Meteorological Organization (WMO) and the Global Water Partnership (GWP)

July 2026

1. Introduction

This report consolidates the results of the initial stakeholder consultations conducted in Panama and Costa Rica in support of the Concept Note of the regional project submitted to the Adaptation Fund. The main text presents, in English, the narrative summaries of the national consultations prepared by CRRH-SICA. The original Spanish versions of these summaries, together with the full national consultation reports, are provided in the annexes: Annex I contains the original narrative summaries (CRRH-SICA); Annex II contains the technical report of the consultations for the Tempisque and Parrita-Candelaria river basins in Costa Rica; and Annex III contains the final report of the national consultation workshop held in Panama, prepared for the Institute of Meteorology and Hydrology of Panama (IMHPA).

2. National consultation workshop in Panama: Tonosí and La Villa river basins

2.1 Overview, participation and methodology

The national consultation workshop was held on 17 and 18 February 2025, from 8:30 a.m. to 4:00 p.m., in the Training Hall of the Ascanio Arosemena Center of the Panama Canal Authority (ACP). It was convened as part of the co-creation process of the regional proposal to be submitted to the Adaptation Fund, with the purpose of socializing, strengthening and building consensus on the key aspects of the project Concept Note.

The workshop gathered a total of 47 participants, comprising 22 women and 25 men, representing 14 public and non-governmental entities, including MiAmbiente, MIDA, the Ministry of Economy and Finance, ACP, the Civil Aeronautics Authority, IDIAP, SINAPROC, the University of Panama, the Technological University of Panama, Fundación Natura, IICA, WMO, CRRH-SICA, GWP and IMHPA. Members of the project team also participated virtually, in view of the regional dimension of the initiative. The opening high-level segment included the Director General of IMHPA, the Director of Hydrology of WMO, and the Director of Climate Change of MiAmbiente, who, in his capacity as focal point to the Adaptation Fund and on behalf of the Minister of Environment as Chair of the IMHPA Board, conveyed the institutional support of the Ministry as Designated Authority for the project.

The workshop followed a participatory methodology combining content presentations by the consulting team on the general context of the project and each of its four components, plenary question-and-answer sessions after each presentation, and two rounds of working groups. Through an active evaluation exercise at the end of the workshop, participants unanimously expressed their satisfaction with all dimensions of the event, including content, materials, participation and logistics.

2.2 Key messages from the discussions

The main ideas emerging from the presentations, plenaries and exchanges can be summarized as follows:

1. Positive reception of the project idea, recognizing its relevance for the generation of reliable information to guide climate management, especially adaptation, in line with the environmental and climate instruments subscribed by Panama.
2. Recognition of the advantages of a regional proposal jointly with Costa Rica, building on previous and ongoing binational coordination processes in environmental matters and risk management.
3. Confirmation of the need to strengthen inter-institutional articulation for the management of climate variability and climate change data and information, led by IMHPA as the State entity responsible for providing reliable and timely meteorological, hydrological and climate information.
4. Positioning of the project as an initiative for articulation among the institutions involved in planning and climate-related risk management, with IMHPA leading that process; institutional arrangements to ensure such coordination should be emphasized, including the possible exploration of joint programmes and public-private partnerships at the full proposal stage.
5. The need for a clear delimitation of institutional competencies and roles, ensuring coherence and complementarity with the existing legal and regulatory frameworks.
6. Attention to existing drought-related programmes in MIDA and MiAmbiente, particularly in the context of the country's obligations under the United Nations Convention to Combat Desertification.
7. Consensus on the selection of the Tonosí river basin, together with the La Villa river basin, as key sites for on-the-ground actions, supported with data shared by MiAmbiente, MIDA and SINAPROC.
8. High receptivity to the cross-cutting axis on gender and vulnerable groups, especially the targeted empowerment of women as key actors in data generation and use, with the suggestion to incorporate outreach activities to foster girls' early interest in STEM fields.
9. A strong suggestion to consider the family dimension, exploring the family as a management unit, in line with previous risk management experiences and with the way climate event data are handled by key entities such as SINAPROC.
10. Recognition that the project is ambitious and broad, so that the delimitation and prioritization of activities is key to ensure consistency with available resources, considering that it involves two countries and several partner entities.
11. On sustainability, two aspects were emphasized: the creation and integration of a critical mass of specialized personnel in meteorology, hydrology and climate sciences; and the importance of technical specifications and quality standards for the stations and equipment

to be procured, to ensure data integrity and integration with national, regional and global databases.

12. Vigilance over the integrity of data generation and management as a critical aspect for decision-making, reaffirming IMHPA's leadership and responsibility in ensuring data quality.
13. Identification of additional key actors to be incorporated in future iterations of the formulation process, including the Panama Tourism Authority, the Ministry of Housing, the basin committees of the selected basins, academia and the private sector, including financial and insurance actors.

2.3 Validation of the priority basins

A dedicated presentation by the Director General of IMHPA set out the criteria applied for the selection of the priority basins: recurrence of historical impacts from floods and droughts; availability of damage and loss estimates; significance within the national GDP; directly or indirectly affected population; limited resilience or adaptation capacity to extreme climate conditions; availability of historical meteorological and hydrological information; and geomorphological characteristics enabling the installation of early warning systems. Six basins were analysed under these criteria (La Villa, Tonosí, Parita, San Pedro, San Pablo, and the inter-basin area between Tabasará and San Pablo), with the Tonosí and La Villa basins systematically meeting the criteria.

The plenary discussions corroborated this selection with institutional data: SINAPROC reported more than 700 dwellings affected by floods in the Tonosí area, including persons with disabilities and pregnant women, and identified Tonosí as the basin currently most affected by floods according to its georeferenced damage assessments; MIDA highlighted the economic importance and exposure of the area, where around 12 to 13 percent of the national rice production is concentrated; and MiAmbiente noted the coincidence of both basins with the ten basins prioritized under its ongoing Resilient Basins project and the national Risk Atlas. At the end of the discussion, consensus was reached on the strategic importance of the Tonosí and La Villa river basins.

2.4 Results of the working groups

Two rounds of working groups were held. The first addressed cross-cutting themes of the Concept Note: governance, public policy and legislation; gender and intergenerational perspective; inter-institutional coordination and communication; sustainability and financing; and monitoring and evaluation. Among the main results, participants confirmed the alignment of the project with existing national policies and legal instruments; called for gender content to be further developed through locally adapted methodologies and family-friendly participation formats; emphasized the need for interoperability of institutional information platforms and homologation of methodologies; identified the need to mobilize complementary financing through strategic alliances, multilateral and bilateral cooperation and public-private partnerships; and clarified that a fully budgeted monitoring and evaluation plan will be required at the fully developed proposal stage, in accordance with Adaptation Fund guidelines.

The second round addressed specific themes of the Concept Note: identification of economic, environmental and social impacts, benefits and risks; implementation arrangements and sustainability; considerations regarding vulnerable groups and gender; and alignment with

national and subnational strategies. Participants identified, among others, the reduction of population vulnerability and of agricultural losses as key impacts; memoranda or letters of understanding among institutions as an effective vehicle for inter-institutional collaboration; persons with disabilities, pregnant women and older adults as priority vulnerable groups, supported by available census data for the Tonosí basin; and a substantial inventory of existing national plans and platforms (including the national risk management policy, the national water resources plan 2015-2050, the Resilient Basins programme and the Risk Atlas) with which the project should articulate, strengthening the operationalization of instruments already in place.

2.5 Overall outcome of the national consultation

The national consultation process in Panama evidenced a broad technical and institutional consensus on the relevance and urgency of strengthening climate change adaptation capacity through the enhancement of hydrometeorological and early warning systems, in articulation with integrated water resources management. Through a participatory approach involving public institutions, regional organizations, academia and civil society, the relevance of a joint regional initiative with Costa Rica was validated, highlighting the value of binational cooperation and the use of previous experiences in risk management and the management of shared basins.

The results underscored the need to strengthen governance and inter-institutional coordination, positioning IMHPA as the leading entity for the generation, integration and dissemination of reliable hydro-climatic information for decision-making, and identified as priorities the integration of data platforms, methodological harmonization and the establishment of formal cooperation mechanisms among key actors. The process also allowed the prioritization of the Tonosí and La Villa river basins, selected for their high vulnerability to floods and droughts, the recurrence of extreme events and their socioeconomic relevance, particularly for rural communities and productive sectors. Finally, the importance of incorporating cross-cutting approaches such as gender, community participation and attention to vulnerable groups was highlighted, as well as ensuring the sustainability of the project through the strengthening of technical capacities, the quality of infrastructure and data, and alignment with existing public policies.

3. National consultations in Costa Rica: Tempisque and Parrita-Candelaria river basins

The consultation with the main stakeholders of the Tempisque and Parrita-Candelaria river basins in Costa Rica was divided into two activities conducted virtually, on 29 June 2026 and 1 July 2026, respectively. During the first consultation, held for the Tempisque basin, several participating stakeholders also carry out fundamental activities in the Parrita-Candelaria basin.

A total of 36 stakeholders were consulted, representing a wide diversity of activities and responsibilities within the basins, which allows important conclusions to be drawn towards building a baseline of positive acceptance of the project concept document.

3.1 Consultation for the Parrita-Candelaria basin

The following narrative derives from the consultations conducted with stakeholders in the basin, as well as with participants in the Tempisque river basin consultation who also have an important role in the Parrita-Candelaria basin. The narrative summarizes the opinions and

recommendations of these stakeholders, on the understanding that, as project formulation advances, additional consultations may be carried out to validate a final product.

The project in the Parrita-Candelaria basins is conceived as a strategic climate adaptation initiative whose sustainability depends, to a large extent, on the empowerment of local actors.

From its conceptual phase, the need to actively involve communities, institutions and productive sectors is recognized, ensuring that their capacities, knowledge and experience form an integral part of the design and future implementation. This participatory approach not only responds to the requirements of international financing, but also reinforces the viability and legitimacy of the project in the territory.

In this context, access to open data emerges as a fundamental axis. The availability and use of hydrometeorological information not only improves decision-making, but also strengthens transparency and articulation among actors. However, the value of these data depends on their accessibility: information must be translated into clear, understandable and useful formats for the general population, so that it can be incorporated into everyday activities and risk prevention.

A central component of the project is the strengthening of early warning systems for extreme climate events. In this regard, the project intends to build on the experience and capacities of the Costa Rican Institute of Electricity (ICE), particularly in data management and the operation of systems associated with water and energy security. The incorporation of new technologies will make it possible to modernize these systems, optimize the dissemination of alerts and contribute to reducing damage to communities, critical infrastructure and productive activities.

The project likewise has a cross-cutting impact on various sectors. The improvement of warning systems and information management will contribute to strengthening emergency response in coordination with the National Emergency Commission, to reducing impacts on agricultural sectors such as banana and African palm, and to promoting the evolution of irrigation systems towards more efficient, precision-based schemes, in coordination with institutions such as the National Irrigation and Drainage Service of the Ministry of Agriculture and Livestock (SENARA).

Finally, the initiative builds on the solid institutional experience of ICE, as well as on the possibility of replicating good practices developed in other basins of the country, such as the Reventazón. This accumulated learning opens the opportunity to scale the project to the national and regional levels, promoting the exchange of knowledge and cooperation among Central American countries. In this way, the project not only responds to local needs, but also positions itself as a potential model for integrated water resources management and climate change adaptation in the region.

3.2 Consultation for the Tempisque river basin

The consultation carried out with key stakeholders of the Tempisque river basin, within the framework of the formulation process of a project for the Adaptation Fund, allowed a broad validation of the relevance and approach of the proposal, as well as the collection of substantive inputs for its strengthening. In general, participants gave a positive assessment of the proposal, highlighting in particular the integrated basin management approach, its multi-sectoral character and the emphasis on strengthening monitoring, forecasting and early warning systems as a basis for improving decision-making around water resources.

The results of the consultation confirm that the project responds to a real need of the territory, characterized by growing climate variability, recurrent drought and flood events and a high demand for coordination among sectors. However, they also evidence the need to deepen some key aspects. In particular, the importance of reinforcing the water security approach was noted, incorporating more explicitly the supply of water for human consumption, the protection of ecosystems and the consideration of environmental flows as central elements in the management of the resource.

Likewise, although the basin approach was widely supported, stakeholders agreed that its implementation in practice still faces limitations, especially in terms of inter-institutional coordination and governance. In this regard, the need arises to advance towards more effective articulation mechanisms that allow efforts to be integrated, duplication to be avoided and the impact of interventions to be maximized.

A recurring theme in the consultation was the management of hydroclimatic information. Although various institutions generate and hold an important base of data, challenges persist in their integration, accessibility and use. Participants stressed that information must not only be public, but also translated into clear, timely and useful products for end users, especially producers and communities, who require practical tools for decision-making in their daily activities.

In line with the above, the importance of strengthening anticipatory risk management was highlighted, going beyond reactive responses to extreme events. Planning must consider productive cycles, particularly in sectors such as agriculture and livestock, where decisions require longer time horizons. This reinforces the need for more robust, action-oriented forecasting and early warning systems.

The consultation also evidenced the value of promoting territory-based solutions, including sustainable soil management practices, infiltration techniques and adaptive productive models that contribute to improving water recharge and the resilience of productive systems. These local experiences are considered fundamental to complement information systems and strengthen adaptation capacities.

Additionally, reinforcing institutional articulation and ensuring the financial sustainability of the project were identified as priorities, promoting strategic alliances and access to international cooperation funds. Coordination among actors is seen as a key element to avoid the fragmentation of efforts and enhance synergies.

Overall, the consultation reflects a high degree of consensus on the relevance and timeliness of the proposal, while providing clear guidance for its improvement. Among the emerging strategic messages are the need to operationalize the basin approach, to ensure that hydroclimatic information is translated into concrete decisions, to place end users at the center of the project, to promote anticipation in risk management and to strengthen territorial solutions as an indispensable complement to technical systems.

In conclusion, the participatory process confirms the coherence of the project with the needs of the territory and offers key inputs for its adjustment, orienting it towards a more integral, inclusive and effective intervention, capable of reducing vulnerability and increasing the resilience of communities, productive systems and ecosystems in the Tempisque river basin.

4. Concluding note

The consultations documented in this report correspond to the Concept Note stage of the project. As established in the Concept Note, during the preparation of the fully developed proposal the same institutions will be consulted again, together with vulnerable groups, basin committees and specific beneficiary sectors, in order to validate and further develop the design of project activities.

Annex I. Narrative summaries of the national consultations (original Spanish version, CRRH-SICA)

PROYECTO FONDO ADAPTACION AL CAMBIO CLIMATICO COSTA RICA-PANAMA

Resúmenes en narrativa de las consultas nacionales

Preparado por: Comité Regional de Recursos Hidráulicos (CRRH-SICA)

Taller nacional de consulta Cuencas de los ríos Tonosí y La Villa Panamá

Efectuado los días 17 y 18 de febrero de 2025, de 8.30 am a 4.00 pm, en el Salón de Capacitaciones del Centro Ascanio Arosemena de la ACP.

El taller tuvo un total de [47 participantes](#), desagregados en 22 mujeres y 25 hombres, en representación de 14 entidades públicas y no gubernamentales. Igualmente se contó con la participación virtual de miembros del equipo de proyecto en atención a su dimensión regional. Mediante una dinámica de evaluación activa al final del taller, los participantes expresaron unánimemente satisfacción con las dimensiones del evento incluyendo los aspectos de contenido, materiales, participación y logística

El proceso de consulta nacional en Panamá evidenció un amplio consenso técnico e institucional sobre la pertinencia y urgencia de fortalecer la capacidad de adaptación al cambio climático mediante el perfeccionamiento de los sistemas hidrometeorológicos y de alerta temprana, en articulación con la gestión integrada de los recursos hídricos.

A través de un enfoque participativo que involucró a instituciones públicas, organismos regionales, academia y sociedad civil, se validó la relevancia de una iniciativa regional conjunta con Costa Rica, destacando el valor de la cooperación binacional y el aprovechamiento de experiencias previas en gestión de riesgos y manejo de cuencas compartidas.

Los resultados del taller subrayaron la necesidad de fortalecer la gobernanza y la coordinación interinstitucional, posicionando al Instituto de Meteorología e Hidrología de Panamá (IMHPA) como entidad líder en la generación, integración y difusión de información hidro-climática confiable para la toma de decisiones. Asimismo, se identificó como prioridad la integración de plataformas de datos, la homologación metodológica y el establecimiento de mecanismos formales de cooperación entre actores clave.

El proceso permitió también priorizar territorios estratégicos, destacándose las cuencas de los ríos Tonosí y La Villa, seleccionadas por su alta vulnerabilidad a inundaciones y sequías, la recurrencia de eventos extremos y su relevancia socioeconómica, particularmente para comunidades rurales y sectores productivos.

Finalmente, se resaltó la importancia de incorporar enfoques transversales como género, participación comunitaria y atención a grupos vulnerables, así como de asegurar la sostenibilidad del proyecto mediante el fortalecimiento de capacidades técnicas, la calidad de la

infraestructura y datos, y la alineación con políticas públicas existentes. En conjunto, la consulta aportó insumos clave para consolidar una propuesta robusta, inclusiva y coherente con las prioridades nacionales y regionales de adaptación climática.

Consultas Costa Rica

La consulta con los principales actores de las cuencas de los ríos Tempisque y Parrita-Candelaria realizadas en Costa Rica se dividieron en dos actividades efectuadas virtualmente, los días 29 de junio de 2026 y 1º de julio de 2026, respectivamente; sin embargo, durante la primera consulta realizada para la cuenca del Tempisque participaron actores que igualmente tiene actividades fundamentales en la cuenca Parrita-Candelaria.

Un total de 36 actores fueron consultados, representando una amplia diversidad de actividades y responsabilidades dentro de la cuenca lo que permite llegar a conclusiones importantes para construir una línea base de aceptación positiva del documento de concepto del proyecto.

Consulta cuenca del Parrita-Candelaria Costa Rica

Resumen en narrativa:

La siguiente narrativa evoluciona de las consultas realizadas con actores en la cuenca, así como actores participantes en la consulta de la cuenca del río Tempisque que tienen una participación importante también en la cuenca del Parrita-Candelaria; la narrativa resume las opiniones y recomendaciones de estos actores, bajo el entendido de que conforme avance la formulación del proyecto se puedan realizar consultas adicionales de validación de un producto final.

El proyecto en las cuencas de Parrita-Candelaria se concibe como una iniciativa estratégica de adaptación climática cuya sostenibilidad depende, en gran medida, del empoderamiento de los actores locales.

Desde su fase conceptual, se reconoce la necesidad de involucrar activamente a las comunidades, instituciones y sectores productivos, asegurando que sus capacidades, conocimientos y experiencias sean parte integral del diseño y futura implementación. Este enfoque participativo no solo responde a los requerimientos de financiamiento internacional, sino que también refuerza la viabilidad y legitimidad del proyecto en el territorio.

En este contexto, el acceso a datos abiertos emerge como un eje fundamental. La disponibilidad y uso de información hidrometeorológica no solo mejora la toma de decisiones, sino que fortalece la transparencia y la articulación entre actores. Sin embargo, el valor de estos datos depende de su accesibilidad: es necesario que la información se traduzca en formatos claros, comprensibles y útiles para la población en general, de modo que pueda ser incorporada en actividades cotidianas y en la prevención de riesgos.

Un componente central del proyecto es el fortalecimiento de los sistemas de alerta temprana frente a eventos climáticos extremos. En este sentido, se plantea aprovechar la experiencia y las capacidades del Instituto Costarricense de Electricidad (ICE), particularmente en el manejo de datos y operación de sistemas asociados a la seguridad hídrica y energética. La incorporación de nuevas tecnologías permitirá modernizar estos sistemas, optimizar la difusión de alertas y

contribuir a la reducción de daños en comunidades, infraestructura crítica y actividades productivas.

Asimismo, el proyecto tiene un impacto transversal en diversos sectores. La mejora en los sistemas de alerta y en la gestión de la información contribuirá a fortalecer la respuesta ante emergencias en coordinación con la Comisión Nacional de Emergencias, a reducir las afectaciones en sectores agrícolas como el bananero y palma africana, y a impulsar la evolución de los sistemas de riego hacia esquemas más eficientes y de precisión, en coordinación con instituciones como el Servicio Nacional de Riego y Avenamiento del Ministerio de Agricultura y Ganadería (SENARA).

Finalmente, la iniciativa se apoya en la sólida experiencia institucional del ICE, así como en la posibilidad de replicar buenas prácticas desarrolladas en otras cuencas del país, como el Reventazón. Este aprendizaje acumulado abre la oportunidad de escalar el proyecto a nivel nacional y regional, promoviendo el intercambio de conocimientos y la cooperación entre países centroamericanos. De esta forma, el proyecto no solo responde a necesidades locales, sino que también se posiciona como un modelo potencial de gestión integrada del recurso hídrico y adaptación al cambio climático en la región.

Consulta cuenca del río Tempisque Costa Rica

Resumen en narrativa:

La consulta realizada a actores clave de la cuenca del río Tempisque, en el marco del proceso de formulación de un proyecto para el Fondo de Adaptación, permitió validar ampliamente la pertinencia y el enfoque de la propuesta, así como recoger aportes sustantivos para su fortalecimiento. En general, los participantes valoraron positivamente el planteamiento, destacando especialmente el enfoque de gestión integrada por cuenca, su carácter multisectorial y el énfasis en el fortalecimiento de sistemas de monitoreo, pronóstico y alerta temprana como base para mejorar la toma de decisiones en torno al recurso hídrico.

Los resultados de la consulta confirman que el proyecto responde a una necesidad real del territorio, caracterizado por una creciente variabilidad climática, eventos recurrentes de sequías e inundaciones y una alta demanda de coordinación entre sectores. Sin embargo, también evidencian la necesidad de profundizar algunos aspectos clave. En particular, se señaló la importancia de reforzar el enfoque de seguridad hídrica, incorporando de forma más explícita el abastecimiento de agua para consumo humano, la protección de los ecosistemas y la consideración de los caudales ambientales como elementos centrales en la gestión del recurso.

Asimismo, si bien el enfoque por cuenca fue ampliamente respaldado, los actores coincidieron en que su implementación en la práctica aún enfrenta limitaciones, especialmente en términos de coordinación interinstitucional y gobernanza. En este sentido, se plantea la necesidad de avanzar hacia mecanismos más efectivos de articulación que permitan integrar esfuerzos, evitar duplicidades y maximizar el impacto de las intervenciones.

Un tema recurrente en la consulta fue el manejo de la información hidroclimática. Aunque diversas instituciones generan y disponen de una base importante de datos, persisten desafíos

en su integración, accesibilidad y uso. Los participantes subrayaron que la información no solo debe ser pública, sino también traducida en productos claros, oportunos y útiles para los usuarios finales, especialmente productores y comunidades, quienes requieren herramientas prácticas para la toma de decisiones en sus actividades cotidianas.

En línea con lo anterior, se destacó la importancia de fortalecer una gestión anticipada del riesgo, que vaya más allá de respuestas reactivas ante eventos extremos. La planificación debe considerar los ciclos productivos, particularmente en sectores como la agricultura y la ganadería, donde las decisiones requieren horizontes de tiempo más amplios. Esto refuerza la necesidad de sistemas de pronóstico y alerta temprana más robustos y orientados a la acción.

La consulta también puso en evidencia el valor de promover soluciones basadas en el territorio, incluyendo prácticas de manejo sostenible de suelos, técnicas de infiltración y modelos productivos adaptativos que contribuyan a mejorar la recarga hídrica y la resiliencia de los sistemas productivos. Estas experiencias locales se consideran fundamentales para complementar los sistemas de información y fortalecer las capacidades de adaptación.

Adicionalmente, se identificó como prioritario reforzar la articulación institucional y asegurar la sostenibilidad financiera del proyecto, promoviendo alianzas estratégicas y el acceso a fondos de cooperación internacional. La coordinación entre actores es vista como un elemento clave para evitar la fragmentación de esfuerzos y potenciar sinergias.

En conjunto, la consulta refleja un alto grado de consenso sobre la relevancia y oportunidad de la propuesta, al tiempo que aporta orientaciones claras para su mejora. Entre los mensajes estratégicos emergentes destacan la necesidad de operativizar el enfoque de cuenca, asegurar que la información hidroclimática se traduzca en decisiones concretas, colocar a los usuarios finales en el centro del proyecto, promover la anticipación en la gestión del riesgo y fortalecer las soluciones territoriales como complemento indispensable de los sistemas técnicos.

En conclusión, el proceso participativo confirma la coherencia del proyecto con las necesidades del territorio y ofrece insumos clave para su ajuste, orientándolo hacia una intervención más integral, inclusiva y efectiva, capaz de reducir la vulnerabilidad y aumentar la resiliencia de las comunidades, los sistemas productivos y los ecosistemas en la cuenca del río Tempisque.

Annex II. Technical report of the consultations for the Tempisque and Parrita-Candelaria river basins, Costa Rica (original Spanish version)

Resumen técnico de las consultas sobre el proyecto a actores principales de las cuencas de los ríos Tempisque y Parrita-Candelaria (Costa Rica)

- **Contexto de la consulta**

Las consultas fueron realizadas de manera virtual en dos sesiones, los días 29 de junio de 2026 (cuenca del río Tempisque) y 1° de julio de 2026 (cuenca Parrita-Candelaria). Durante la primera sesión participaron actores que igualmente desarrollan actividades fundamentales en la cuenca Parrita-Candelaria, por lo que buena parte de los resultados aquí resumidos es extensible a ambas cuencas.

La consulta fue realizada con actores clave del sector hídrico, productivo, académico e institucional vinculados a la cuenca del río Tempisque, con el propósito de recoger opiniones, observaciones y aportes técnicos sobre la propuesta de proyecto regional presentada al Fondo de Adaptación, orientada a fortalecer la resiliencia ante sequías e inundaciones en Costa Rica y Panamá.

El proyecto busca abordar brechas críticas en monitoreo, pronóstico, alerta temprana y gestión del agua, bajo un enfoque integrado regional–nacional–local, con énfasis en cuencas piloto y comunidades vulnerables.

- **Valoración general de la propuesta**

Los actores consultados expresaron una valoración ampliamente positiva del proyecto, destacando:

- La pertinencia del enfoque por cuenca, considerado adecuado para la gestión integrada del recurso hídrico.
- La relevancia del co-diseño con comunidades, como mecanismo para asegurar soluciones adaptadas a necesidades locales.
- El carácter multisectorial del agua, reconociendo su rol como eje transversal entre agricultura, energía, abastecimiento humano y ecosistemas.
- El énfasis en fortalecimiento institucional, datos e información, alineado con la necesidad de mejorar la toma de decisiones sobre oferta y demanda de agua.

En este sentido, la propuesta es percibida como consistente con los objetivos del Fondo de Adaptación, orientados a reducir vulnerabilidad y aumentar resiliencia frente a sequías e inundaciones.

- **Principales observaciones técnicas de los actores**

- Fortalecer el enfoque en abastecimiento humano y ecosistemas

Se identificó la necesidad de:

- Incorporar con mayor claridad el abastecimiento de agua para consumo humano dentro del proyecto.
- Ampliar el concepto de agua incluyendo ecosistemas y caudales ambientales.

Esto sugiere reforzar el enfoque de seguridad hídrica integral, más allá de usos productivos.

- Consolidar el enfoque de gestión integrada por cuenca

Aunque el proyecto adopta el enfoque de cuenca, se señaló que:

- En Costa Rica este enfoque aún es débilmente implementado.
- Se requiere fortalecer su aplicación práctica en planificación y coordinación interinstitucional.

Esto coincide con la brecha identificada en el proyecto sobre gobernanza y coordinación institucional.

- Aprovechamiento e integración de información existente

Diversas instituciones (ej. sector riego y energía) indicaron que:

- Existe abundante información hidrológica, topográfica e hidrometeorológica ya disponible.
- Es necesario evitar duplicidades y promover la integración de datos y sinergias institucionales.

Esto refuerza la pertinencia del componente de interoperabilidad de datos y sistemas de información del proyecto.

- **Acceso y usabilidad de la información climática**

Los actores destacaron limitaciones en:

- El acceso a datos hidrometeorológicos (restricciones institucionales).
- La capacidad de los usuarios (ej. productores) para interpretar información técnica.

Se recomendó:

- Garantizar que la información del proyecto sea pública y accesible.
- Desarrollar productos adaptados a usuarios finales, con formatos simples y canales adecuados.

Esto se alinea con la brecha de productos sectoriales insuficientes y comunicación de última milla identificada en el proyecto.

- **Necesidad de fortalecer la prevención y gestión anticipada**

Especialmente desde el sector productivo (ganadería y agricultura), se enfatizó que:

- La gestión de sequías e inundaciones debe ser anticipada y no reactiva.
- Los sistemas de alerta deben considerar ciclos productivos largos, no solo eventos inmediatos.

Esto refuerza la importancia de los componentes de:

- Pronóstico climático
- Sistemas de alerta temprana
- Planes de gestión de sequía e inundaciones
- **Soluciones basadas en manejo del territorio**

Se presentaron experiencias prácticas, como:

- Técnicas de infiltración y manejo de suelos que permiten aumentar la recarga hídrica.
- Enfoques productivos sostenibles (ej. ganadería adaptativa).

Estas aportaciones sugieren fortalecer el componente de:

- pilotos en cuencas y soluciones basadas en naturaleza dentro del proyecto.
- **Articulación institucional y financiamiento**

Se identificaron aspectos clave:

- Necesidad de mayor coordinación entre instituciones (ej. riego, energía, meteorología).
- Importancia de movilizar recursos y evitar duplicidades.
- Interés en aprovechar fondos de adaptación y cooperación internacional.

Esto coincide con la necesidad de fortalecer:

- Gobernanza
- Sostenibilidad financiera
- Alianzas estratégicas
- **Principales mensajes estratégicos derivados de la consulta**

A partir de las intervenciones, emergen cinco mensajes clave para el ajuste del proyecto:

1. **El enfoque por cuenca es correcto, pero requiere operativizarse** mediante coordinación efectiva, planificación y gobernanza.
 2. **La información es el núcleo del proyecto**, pero debe ser integrada, accesible y traducida en decisiones prácticas.
 3. **El usuario final (productor/comunidad) debe estar en el centro**, garantizando utilidad real de los productos climáticos.
 4. **La adaptación requiere anticipación**, no solo respuesta a eventos extremos.
 5. **Las soluciones territoriales y productivas son esenciales** para complementar los sistemas de alerta temprana.
- **Implicaciones para la propuesta al Fondo de Adaptación**

La consulta valida la coherencia conceptual del proyecto, particularmente en:

- Sistemas hidroclimáticos y redes de monitoreo
- Alerta temprana y gestión del riesgo
- Gobernanza e integración institucional
- Pilotos en cuencas con enfoque participativo

Sin embargo, sugiere reforzar:

- Enfoque en seguridad hídrica (consumo humano + ecosistemas)
- Accesibilidad y usabilidad de la información
- Integración de conocimiento local y prácticas productivas
- Mecanismos concretos de coordinación institucional y datos abiertos
- **Conclusión**

La consulta a actores de la cuenca del Tempisque evidencia un alto nivel de alineación entre la propuesta del proyecto y las necesidades reales del territorio, especialmente frente a la creciente variabilidad climática, sequías prolongadas y eventos de inundación.

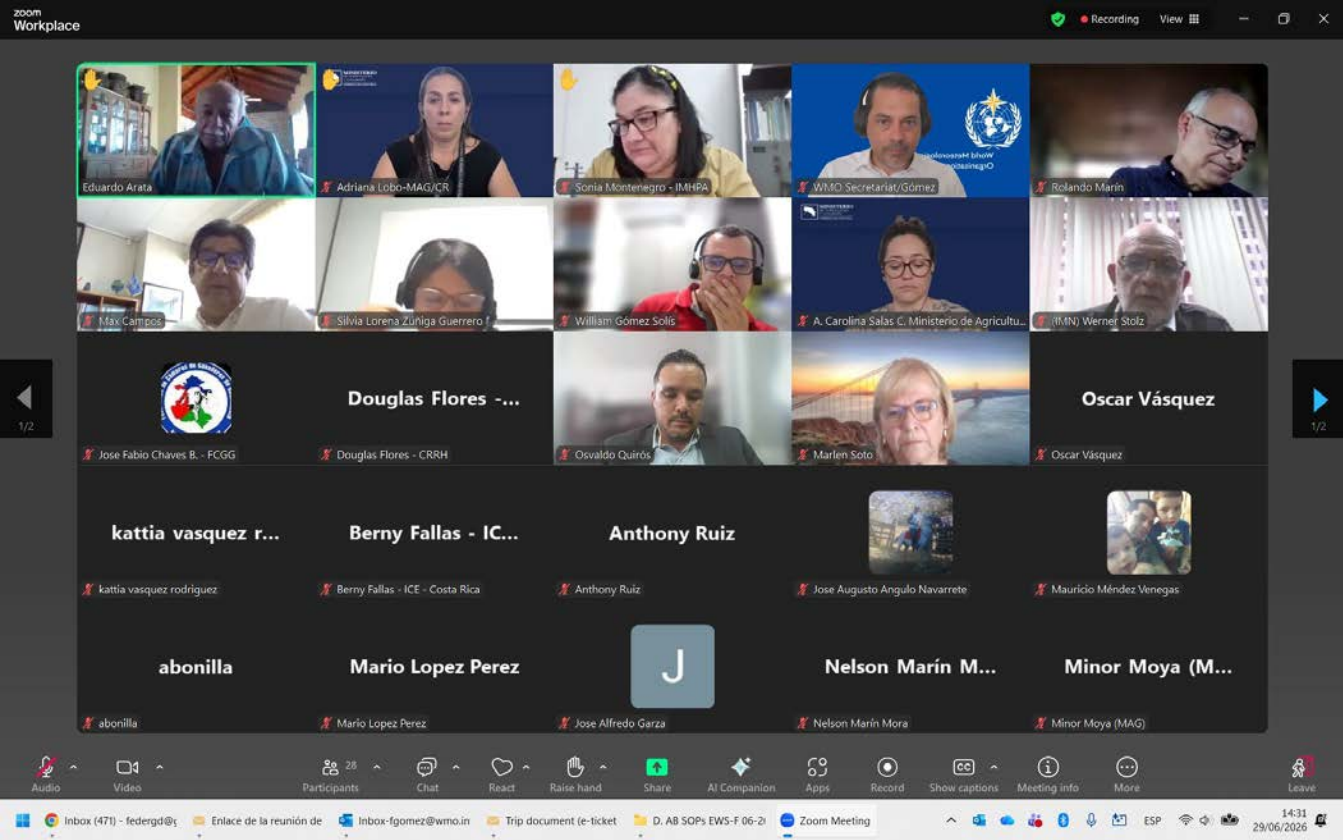
Al mismo tiempo, aporta insumos críticos para mejorar la propuesta, orientándola hacia una adaptación más operativa, inclusiva y basada en el territorio, donde la información hidroclimática se traduzca en decisiones concretas que reduzcan la vulnerabilidad y fortalezcan la resiliencia de los sistemas productivos, ecosistemas y comunidades.

ANEXO A. Lista de participantes

Nombre	Organización	Teléfono/correo
Mauren Ballester	Consultora PNUD	8814 7010
Adriana Bonilla	Directora Dirección Cambio Climático MINAE	8724 7888 abonilla@minae.go.cr
José Fabio Chaves	Presidente Federación de Cámaras Ganaderas de Guanacaste	7108 2033 Jchaves@FCGG.co.cr
Nelson Marín	Area de conservación Tempisque	8826 1601 <nel.somar.tempisque@gmail.com>
Oscar Vasquez	Ministerio de Agricultura y Ganadería	8417 5147
Adriana Lobo	Dir. Cooperación Internacional Ministerio de Agricultura y Ganadería	8866 8076 alobo@mag.co.cr
Rolando Marín	Gestión Comunitaria del Agua	8843 5340 Marin.rolando@gmail.com
Silvia Zuniga	Centro Mesoamericano de Desarrollo Sostenible del Trópico Seco (CEMEDE)	8814 6668 cemedede@una.cr
Pavel Solis	Coordinador Red Cambio Climático (CEMEDE)	8814 6668 cemedede@una.cr
Laura Saurez	Presidenta Ejec. AyA	lsaurez@aya.go.cr
Roy Barboza	Presidente ACREH	8819 0605
Yessenia Calderon	Junta Directiva ACREH	8819 0605
Kattia Vasquez		<kattiavas.quezrodriguez98@gmail.com>
Ernesto Bonilla	Municipalidad Carillo	<e_bonilla@municarrillo.go.cr>
Berny Fallas	ICE	befall@ice.go.cr
Fabiola Tábor	GWP	<ftabora@gwpcentroamerica.org>
Eduardo Arata		earata1956@gmail.com
Osvaldo Quirós	SENARA	oquiros@senara.go.cr
Sonia Montenegro	IMHPA	smontenegro@imhpa.gob.pa
José Miguel Zeledón	Dirección de Agua	jzeledon@da.go.cr
Federico Gómez	OMM	fgomez@wmo.int
Werner Stolz	IMN	wstolz@imn.ac.cr
Mario López		mario.lopezamh@gmail.com
José Alfredo Garza		jagarzal@gmail.com

Nombre	Organización	Teléfono/correo
Anthony Ruiz	SINAC	anthony.ruiz@sinac.go.cr
William Gómez	UNA	<William.gomez.solis@una.cr>

Anexo B. Fotografía de la sesión de trabajo de la consulta



Annex III. Final report of the national consultation workshop in Panama (original Spanish version, prepared for IMHPA)

*Mayté González S.
Marzo 2025*

*Informe presentado a:
IMHPA*

INFORME FINAL

FACILITACIÓN DEL TALLER NACIONAL DE CONSULTA PARA EL PROYECTO “FORTALECIMIENTO DE LA CAPACIDAD DE ADAPTACIÓN AL CAMBIO CLIMÁTICO EN AMÉRICA CENTRAL, CON ESPECIAL ATENCIÓN EN COSTA RICA Y PANAMÁ: PERFECCIONAMIENTO DE LOS SISTEMAS HIDROCLIMÁTICOS Y DE ALERTA TEMPRANA Y SU INTEGRACIÓN PARA LA GESTIÓN DE LOS RECURSOS HÍDRICOS”

1. Resumen Ejecutivo

El presente informe final consolida los resultados del proceso preparatorio y la implementación del “TALLER NACIONAL DE CONSULTA PARA EL PROYECTO FORTALECIMIENTO DE LA CAPACIDAD DE ADAPTACIÓN AL CAMBIO CLIMÁTICO EN AMÉRICA CENTRAL, CON ESPECIAL ATENCIÓN EN COSTA RICA Y PANAMÁ: PERFECCIONAMIENTO DE LOS SISTEMAS HIDROCLIMÁTICOS Y DE ALERTA TEMPRANA Y SU INTEGRACIÓN PARA LA GESTIÓN DE LOS RECURSOS HÍDRICOS”, realizado los días lunes 17 y martes 18 de febrero de 2025 en horario de 8.30am a 4.00pm en el Salón de Capacitaciones del Centro Ascanio Arosemena de la ACP.

El taller se realizó como parte del proceso de co-creación de la propuesta regional a ser presentada al Fondo de Adaptación, con el propósito de socializar, fortalecer y consensuar los aspectos claves de la nota concepto del proyecto. Mediante una metodología participativa, durante los dos días del taller se fomentó una interacción continua entre los participantes, el equipo técnico del IMHPA y el equipo consultor, a través de una dinámica de presentaciones de contenido por parte de los consultores exponiendo tanto el contexto general del proyecto como los componentes de la nota de concepto, seguido de plenarias de preguntas y respuestas y trabajos grupales en torno a preguntas previamente definidas. Con esta dinámica se cumplió a cabalidad con el objetivo del taller de socializar y enriquecer la propuesta con las reacciones y aportes de los participantes, además de generar la intención de compromiso de participación sostenida de los participantes en las fases siguientes de afinación de la nota concepto, propuesta completo del proyecto y su implementación.

Con un principio de flexibilidad adaptativa, la agenda establecida para los dos días fue completada en su totalidad, incluyendo tanto las exposiciones programadas, como los tiempos de plenaria y trabajo en grupo para interacción entre los participantes y consultores. Incluso se contó con la oportunidad de un espacio no previsto en la agenda original para ampliación de información relevante de datos de gestión de eventos desastres naturales presentada por el representante del Centro de Operaciones de Emergencia del SINAPROC, que enriqueció la discusión.

El taller tuvo un total de 47 participantes, desagregados en 22 mujeres y 25 hombres, en representación de 14 entidades públicas y no gubernamentales. Igualmente se contó con la participación virtual de

miembros del equipo de proyecto en atención a su dimensión regional. Mediante una dinámica de evaluación activa al final del taller, los participantes expresaron unánimemente satisfacción con las dimensiones del evento incluyendo los aspectos de contenido, materiales, participación y logística.

Aspectos claves e ideas fuerza de la discusión e intercambios incluyeron los siguientes puntos:

1. Positiva recepción de los participantes a la idea de proyecto, reconociendo su relevancia y pertinencia en el contexto más amplio de generación de información confiable para orientar la gestión climática, especialmente la adaptación, con la cual se ha comprometido el país a través de los instrumentos ambientales y climáticos suscritos por Panamá.
2. Evidenciadas por los participantes las ventajas de una propuesta regional y conjunta con Costa Rica, construyendo sobre experiencias y procesos previos y actuales de coordinación binacional, tanto en materia ambiental como de gestión del riesgo.
3. El taller sirvió como un espacio de intercambio técnico para corroborar la necesidad y deseabilidad de fortalecer la articulación interinstitucional para la gestión de datos e información de variabilidad y cambio climático liderada por el IMHPA como la entidad del Estado panameño responsable de ofrecer información confiable y oportuna en los temas meteorológicos, hidrológicos y climáticos para la toma de decisiones informadas y la gestión ambiental, climática y del riesgo de desastres.
4. Un elemento clave de las discusiones fue el posicionamiento del proyecto como una iniciativa de articulación entre las diversas instituciones relacionadas con la planificación y la gestión del riesgo asociado a la variabilidad climática; siendo el IMHPA la entidad posicionada por su experiencia y mandato institucional para liderar dicho proceso de articulación a través del proyecto. La articulación institucional requerirá un énfasis especial del proyecto en proponer los arreglos institucionales que aseguren dicha coordinación y operativización, comentándose la posibilidad de explorar figuras como Programas Conjuntos y Alianzas Público-Privadas al momento de plantear los arreglos institucionales en la propuesta final del proyecto.
5. Se enfatizó que el proyecto debe partir de una clara delimitación de las competencias y roles institucionales para garantizar coherencia y complementariedad con las políticas y marcos legales y reglamentarios del ecosistema público y privado relacionado con la gestión climática y ambiental.
6. En particular, se llamó la atención sobre la necesidad de considerar la existencia y gestión activa de programas relacionados con la sequía tanto en el MIDA como en el MiAmbiente, principalmente en el contexto de las acciones país para cumplir con las obligaciones y compromisos derivados de la Convención de las Naciones Unidas de Lucha contra la Desertificación y otros instrumentos internacionales y programas locales.
7. Consenso entre los participantes sobre la deseabilidad y conveniencia de la selección de la Cuenca del Río Tonosí como uno de los sitios clave para las acciones in situ del proyecto, junto a la Cuenca del Río La Villa, lo cual se sustentó con datos compartidos por los representantes de diversas instituciones incluyendo el MiAmbiente, MIDA y Sinaproc.
8. Los participantes mostraron alta receptividad al eje transversal de aspectos de género y atención especial de grupos vulnerables, especialmente la incorporación activa y dirigida de actividades para empoderar a las mujeres como actores clave en el proceso de generación y uso de datos, sugiriéndose también incorporar de manera directa el trabajo de promoción con niñas para fomentar su temprano interés e involucramiento en las áreas de ciencias, tecnología, ingeniería y matemáticas.
9. En el punto de ejes transversales y colectivos vulnerables, se sugirió fuertemente considerar la dimensión familiar, explorando el uso de la familia como unidad de gestión, en atención tanto a

experiencias previas en gestión de riesgo, así como la forma en que la data sobre eventos de variabilidad y cambio climático está siendo manejada por entidades claves como el SINAPROC.

10. El proyecto es ambicioso y amplio. La delimitación y priorización de actividades es clave para asegurar simetría con los recursos disponibles del proyecto, considerando que el mismo es un proyecto que incluye 2 países y varias entidades socias para la planificación e implementación.
11. Sobre la dimensión de sostenibilidad de las acciones e impacto posterior al término del proyecto se enfatizaron 2 aspectos claves: a) que la sostenibilidad no se relaciona únicamente con el factor financiero y recursos asignados al proyecto, sino también con la creación, fortalecimiento e integración a las actividades del proyecto de masa crítica formada y especializada en los temas de meteorología, hidrología y ciencias climáticas en general; b) las especificaciones técnicas de las estaciones y equipos cuya adquisición se prevé en el proyecto es un aspecto fundamental para asegurar integridad de los datos, así como su integración con bases de datos nacionales, regionales y globales, para lo cual se debe cumplir con estándares técnicos y de calidad.
12. La vigilancia sobre la integridad en la generación y manejo de los datos surgió reiteradamente como un aspecto crítico para orientar la toma de decisiones y la gestión en campo. Se enfatizó la responsabilidad y liderazgo del IMHPA en este rol sobre el aseguramiento de la integridad y calidad de los datos, por lo cual se reconoció la importancia del proyecto para generar las condiciones que fortalezcan y consoliden dicho rol institucional.
13. En cuanto a actores claves, se identificó la necesidad de incluir en futuras iteraciones del proceso de formulación del proyecto a la Autoridad de Turismo de Panamá (ATP), debido al alto peso específico del turismo en la economía nacional y la alta vulnerabilidad/dependencia de esta industria a los eventos de variabilidad climática. Igualmente se comentó sobre la importancia de incorporar al proyecto al Ministerio de Vivienda (MIVI) y los Comités de Cuenca de las cuencas seleccionadas, así como a otras organizaciones del sector público y academia (MIVIOT, UTP, entre otras) y del sector no gubernamental que trabajan a nivel nacional y en las cuencas seleccionadas en acciones relacionadas con la adaptación climática y la gestión del riesgo. La participación del sector privado, incluyendo actores del sector financiero y de seguros, también se comentó como un aspecto deseable en futuras actividades del proyecto.



2. Actividades preparatorias previas y durante el taller

Previo a la realización del taller, el equipo técnico del IMHPA sostuvo un proceso intenso de reuniones virtuales de trabajo e intercambio con el equipo consultor y el equipo de la OMM, el Comité Regional de Recursos Hidráulicos y la Global Water Partnership, como entidades socias del proyecto. Como aporte técnico, el equipo del IMHPA desarrolló un documento interno con observaciones y sugerencias técnicas a la luz del contenido de la nota concepto, el cual, si bien no fue material del taller, se espera que sea parte del material de trabajo y discusión interna entre el IMHPA y el equipo de consultores para su debida consideración e integración.

Como parte de la presente consultoría para la facilitación del taller de consulta, la Consultora elaboró los siguientes documentos de trabajo, incluidos como documentos anexos del presente informe: a) Propuesta metodológica; b) Agenda anotada del taller (paso a paso); c) Plantilla de preguntas orientadoras para el trabajo en grupo; d) Nota logística.

2.1 Reuniones de coordinación

La Consultora participó en 2 reuniones de trabajo preparatorias, así:

a) Reunión presencial con la Ing. Calzadilla, Directora del IMHPA, y la Licda. Sonia Montenegro, Jefe de Cooperación, para revisar conjuntamente la agenda y metodología propuesta y abordar aspectos generales del evento. La reunión se realizó el día martes 4 de febrero de 2025 en el Despacho de la Dirección General del IMHPA. Producto de la reunión se hicieron ajustes a la agenda original propuesta por el equipo consultor y al documento de propuesta metodológica presentado por la facilitadora, para su posterior circulación al equipo de proyecto. Igualmente se revisó la lista de entidades invitadas a participar sugiriendo algunas adiciones para asegurar una alta representatividad. Un breve resumen de los puntos abordados y acordados incluyó:

- Ajustar la agenda del taller para que la jornada termine a las 4pm, en atención a la jornada estándar de las entidades públicas que participarán en el taller. Para maximizar el uso del tiempo se acordó organizar las pausas de café de manera que los participantes se sirvan y regresen a sus puestos sin detener la sesión.
- IMHPA designará a un equipo de funcionarios técnicos y de administración para apoyar la jornada del taller, incluyendo:
 - o Directora General y/o Sub-Directora: además de sus intervenciones para el inicio y cierre del taller, apoyarán en los segmentos de trabajo en grupo como recurso de información y referencia
 - o 4-5 miembros del equipo de Directores para asumir el rol de Facilitador y Relator de los grupos de trabajo
 - o Asistente de Dirección para apoyar la toma de notas durante las sesiones
 - o Apoyo logístico para organizar mesa de materiales; asegurar lista de participantes; apoyo con equipo audiovisual/sonido durante presentaciones y plenarias; aseguramiento de alimentación (refrigerios/almuerzo) y otros aspectos logísticos
- La lista de participantes deberá permitir desagregación por sexo y edad, a fin de evidenciar participación de mujeres, hombres y jóvenes. Se circulará invitación al taller a Fundación Natura y al IICA, como instituciones claves de asistencia al sector agropecuario. En el caso del IICA se

explorará la posibilidad de solicitar apoyo con herramienta de inteligencia artificial para apoyar la sistematización del taller.

- Confirmar a los miembros del equipo consultor y/o entidades participantes (OMM, GWP, otros) que se espera sus intervenciones como expositores para presentar los componentes del proyecto. Para esto, la Licda. Sonia M. del IMHPA elaborará una plantilla para estandarizar las presentaciones. Las presentaciones tendrán una duración aproximada de 25-30 minutos, seguida de una plenaria para interacción con los participantes con preguntas y respuestas, facilitada por la Facilitadora general.
- En la sesión virtual preparatoria a realizarse el día jueves 06-02-2025 se presentará la propuesta de facilitación, a fin de consensuar la dinámica con todo el equipo, incluyendo el equipo de consultores y el equipo de IMHPA.
- El entregable “mapeo de actores” incluido en los términos de referencia estará alineado con la lista de participantes suministrada por el IMHPA.

b) Reunión virtual con el equipo de proyecto para revisar conjuntamente la agenda y la propuesta metodológicas ajustadas e intercambiar aspectos generales del evento. Producto de la reunión también se incorporaron ajustes finales a ambos documentos. La reunión se realizó en plataforma virtual el día jueves 6 de febrero de 2025. A continuación, breve resumen de los puntos abordados:

- Equipo OMM compartirá la hoja de ruta y Sonia M. del IMHPA compartirá documento interno que han elaborado con preguntas/comentarios.
- Se tratará de organizar una sesión virtual de alineación entre equipo consultor y equipo directores del IMHPA. Equipo de consultores y directores del IMHPA sostendrán reuniones preparatorias durante sábado-domingo para asegurar alineación.
- Pendiente confirmar venue Cancillería o ACP para sesión del día 3 (miércoles 19)
- IMHPA remite plantilla para elaboración de presentaciones por componente. OMM apoya elaboración de contenido de presentación inicial del proyecto por la Ing. Calzadilla, incluyendo el proceso desde la hoja de ruta.

Tal como se estableció en la propuesta metodológica, previo al taller el equipo de IMHPA consolidó una serie de materiales de apoyo que estuvieron disponibles durante la actividad, incluyendo el acceso de los participantes a la nota de concepto del proyecto y otra información del proyecto a través de un espacio virtual [SharePoint](#) con acceso habilitado al mismo durante el taller.

Los dos días del evento el equipo del IMHPA y la Facilitadora llegaron al salón de reuniones con antelación para preparar el salón, asegurando los aspectos de tecnología y logística necesarios para la debida realización de los trabajos.

Durante los dos días del taller, el equipo consultor y el equipo del IMHPA sostuvieron reuniones breves para intercambiar aspectos importantes derivados de la discusión y proponer ajustes/énfasis para la discusión, los cuales fueron incorporados en la dinámica del taller por la Facilitadora. Durante los dos días del taller, se cumplió con la agenda programada en el horario de 8.30 a 4.00pm.

2.2 Mapeo de actores

Como parte de las actividades incluidas en los términos de referencia para la consultoría de facilitación del taller de consulta, se incluyó el desarrollo del mapeo de actores clave sectoriales para los talleres, identificando el nivel de interés, importancia e influencia sobre los resultados. A continuación, el resultado del mapeo de actores, partiendo de la lista de invitados al taller proporcionada por el IMHPA como insumo inicial y ampliada con insumos obtenidos durante el propio taller de consulta.

A) Clasificación de actores clave según su nivel de interés, importancia e influencia

Actor	Nivel de Interés	Importancia	Influencia	Rol en el Proyecto
Ministerio de Ambiente (MiAmbiente)	Alto	Alta	Alta	Definición de políticas ambientales y climáticas, integración de estrategias de adaptación.
Ministerio de Desarrollo Agropecuario (MIDA)	Alto	Alta	Alta	Implementación de medidas de adaptación para la agricultura y recursos hídricos.
Ministerio de Economía y Finanzas (MEF)	Medio	Media	Alta	Posible asignación de presupuesto y financiamiento para estrategias de adaptación.
Autoridad del Canal de Panamá (ACP)	Media	Media	Media	Gestión del agua en la Cuenca del Canal, apoyo y orientación para la implementación de sistemas de alerta temprana.
Autoridad de Aeronáutica Civil (AAC)	Medio	Media	Media	Monitoreo climático para seguridad aérea y apoyo en pronósticos.
Instituto de Innovación Agropecuaria de Panamá (IDIAP)	Medio	Media	Media	Investigación en adaptación agrícola a variabilidad climática.
Sistema Nacional de Protección Civil (SINAPROC)	Alto	Alta	Alta	Implementación de alertas tempranas y respuesta a desastres climáticos.
Universidad de Panamá (UP)	Alto	Media	Media	Investigación científica y capacitación en cambio climático y gestión del agua.
Fundación Natura	Medio	Media	Media	Conservación de ecosistemas clave para la resiliencia climática.
Instituto Interamericano de Cooperación para la Agricultura (IICA)	Alto	Media	Media	Desarrollo de capacidades en el sector agropecuario.
Organización Meteorológica Mundial (OMM)	Alto	Alta	Alta	Apoyo técnico y estandarización de sistemas de alerta temprana.
Comité Regional de Recursos Hidráulicos (CRRH)	Alto	Alta	Alta	Coordinación regional para la gestión de recursos hídricos y alerta temprana.

Actor	Nivel de Interés	Importancia	Influencia	Rol en el Proyecto
Global Water Partnership (GWP)	Alto	Media	Media	Enfoque en gobernanza del agua y gestión integrada de recursos hídricos.
Consultores Especializados	Medio	Media	Media	Asesoría técnica en sistemas de alerta y modelación hidroclimática.
Instituto de Meteorología e Hidrología de Panamá (IMHPA)	Alto	Alta	Alta	Líder del proyecto. Generación de información hidroclimática y fortalecimiento de sistemas de monitoreo y alerta temprana.

B) Identificación de otros actores clave:

Actor	Nivel de Interés	Importancia	Influencia	Rol en el Proyecto
Empresa de Transmisión Eléctrica S.A. (ETESA) – Hidrometeorología	Alto	Alta	Alta	Coordinación con y apoyo al IMHPA para el monitoreo de variables climáticas y suministro de datos hidrometeorológicos.
Ministerio de Salud (MINSA)	Medio	Media	Media	Impacto del cambio climático en salud pública, acceso al agua segura.
Ministerio de Vivienda (MIVI)	Medio	Media	Media	Impacto del cambio climático en el ordenamiento territorial y la planificación de las viviendas urbanas y rurales.
Autoridad de Turismo de Panamá (ATP)	Alto	Media	Media	Gestión estratégica y operativa de posibles afectaciones al turismo en sitios priorizados del proyecto
Universidad Tecnológica de Panamá	Alto	Media	Media	Investigación científica y capacitación en cambio climático y gestión del agua.
Municipios y Gobiernos Locales	Alto	Alta	Media	Implementación de medidas de adaptación a nivel comunitario.
Comités de Cuenca de los Ríos Tonosí y la Villa	Alto	Alta	Media	Implementación de medidas de adaptación a nivel comunitario.
Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO)	Alto	Media	Media	Apoyo en estrategias de adaptación en el sector agropecuario.
BID / Banco Mundial / GEF (Fondo para el Medio Ambiente Mundial)	Medio	Alta	Alta	Posibles fuentes de financiamiento para fortalecer la resiliencia climática.
Banco Interamericano de Desarrollo (BID)	Media	Media	Media	Seguimiento y acompañamiento para la implementación de la hoja de ruta

Actor	Nivel de Interés	Importancia	Influencia	Rol en el Proyecto
Cámara de Comercio, Industrias y Agricultura de Panamá	Medio	Media	Alta	Participación del sector privado en estrategias de adaptación.
Sociedad Civil y Organizaciones Comunitarias	Alto	Alta	Media	Implementación de medidas locales y adaptación basada en comunidades.

Una categorización de los actores según su nivel de influencia refleja la siguiente agrupación:

Actores con alta influencia y alta importancia (Prioridad 1):

- **Ministerio de Ambiente, MIDA, SINAPROC, IMHPA, OMM y CRRH** → Son clave para la implementación y toma de decisiones estratégicas.

2. Actores con alta importancia, pero media/baja influencia (Prioridad 2):

- **Fundación Natura, Universidades, GWP, Municipios y Comités de Cuenca** → Pueden beneficiarse del fortalecimiento de capacidades para mejorar su rol en el sistema de alerta y adaptación.

3. Actores con alta influencia, pero menor interés (Prioridad 3):

- **MEF, Cámara de Comercio, BID/Banco Mundial** → Importante involucrarlos para financiamiento y apoyo en políticas económicas relacionadas con adaptación climática.

A la luz de este mapeo de actores, se considera deseable convocar como parte del proceso de fases siguientes de elaboración de la propuesta un grupo de trabajo o instancia interinstitucional que incluya a los actores prioritarios, e integrar un enfoque multisectorial que considere el impacto de la variabilidad y el cambio climático en diferentes áreas como el agua, la agricultura, la energía, la vivienda y la salud. Si bien la puesta en marcha de comunidades de práctica está incluida como una de las actividades del proyecto, se sugiere mantener el enfoque multisectorial e interinstitucional durante las siguientes fases de afinación y formulación del proyecto para un mayor y mejor involucramiento de los actores y demás partes interesadas. Esta multisectorialidad también se puede reflejar en los arreglos institucionales que se establezcan en la propuesta de proyecto.

3. Estadísticas del taller

El taller contó con un total de 47 participantes, desagregados en 22 mujeres y 25 hombres, en representación de 14 entidades públicas, organismos regionales y no gubernamentales. Igualmente se contó con la participación virtual de miembros del equipo de proyecto en atención a su dimensión regional (Sr. José Zúñiga, Asesor Hidrológico Regional para la OMM de la región de Norteamérica, Centroamérica y el Caribe).

A continuación, el desglose de la participación presencial durante los dos días del taller, según los datos extraídos de la lista de asistencia firmada por los participantes.

Número total de participantes: 47

Desagregación por institución y sexo:

Institución	Hombres	Mujeres	Total
1. Ministerio de Ambiente	2	3	5
2. Ministerio de Desarrollo Agropecuario	1	1	2
3. Ministerio de Economía y Finanzas	0	1	1
4. Autoridad del Canal de Panamá	2	0	2
5. Autoridad de Aeronáutica Civil	2	0	2
6. Instituto de Innovación Agropecuaria de Panamá	1	1	2
7. Sistema Nacional de Protección Civil (SINAPROC)	1	1	2
8. Universidad de Panamá	1	0	1
9. Fundación Natura	0	1	1
10. Instituto Interamericano de Cooperación para la Agricultura	1	0	1
11. Organización Meteorológica Mundial	2	1	3
12. Comité Regional de Recursos Hidráulicos (CRRH)	1	0	1
13. Global Water Partnership (GWP)	1	1	2
14. Consultores	2	0	2
15. Facilitadora	0	1	1
16. Instituto de Meteorología e Hidrología de Panamá	8	11	19
TOTALES	25	22	47

4. Resumen del desarrollo de la agenda del taller

A continuación, se presenta una breve relación de la dinámica durante los dos días de taller según los distintos bloques de la agenda.

Día 1. Lunes 17.02.25

Ceremonia de inauguración y apertura. El taller contó con la participación de los siguientes representantes del segmento de alto nivel para dar inicio a los trabajos:

- Sra. Luz Graciela de Calzadilla, Directora General del Instituto de Meteorología e Hidrología de Panamá (IMHPA)
- Sr. Stefan Unlenbrook, Director de Hidrología de la Organización Meteorológica Mundial.
- Sr. Juan Monterrey, Director de Cambio Climático, del Ministerio Modera Mayté G.

En sus palabras, los funcionarios abordaron aspectos claves relacionadas a la importancia estratégica del proyecto, no solo por los actores institucionales involucrados tanto del nivel nacional como regional y global, sino también por la relevancia y sentido de urgencia de la temática que aborda el proyecto, especialmente para un sector altamente vulnerable a la variabilidad y cambio climático como lo es el sector agropecuario. Se enfatizó también la ventaja de un proyecto compartido con Costa Rica y de la participación de instancias técnicas y políticas del nivel regional y global que aseguran un amplio proceso

de transferencia de conocimiento y experiencias entre los participantes del proyecto. El rol de liderazgo del IMHPA fue reconocido y celebrado en las intervenciones, siendo de especial importancia el mensaje transmitido por el Representante del Ministerio del Ambiente en representación del Ministro de Ambiente como Presidente de la Junta Directiva del IMHPA y del propio Sr. Monterrey como punto focal ante el Fondo de Adaptación, en cuanto al apoyo institucional al proyecto de parte del Ministerio como Autoridad Nacional designada ante el Fondo de Adaptación, incluyendo el compromiso para acompañar el proyecto en los aspectos de política pública, asignación de recursos y gestión técnica. La ceremonia protocolar terminó cerró con una foto formal del segmento de alto nivel.

Ronda de presentación de participantes. Para asegurar un ambiente seguro y de participación activa, seguidamente se realizó una ronda breve de presentación de los participantes indicando cada uno Nombre, Entidad que representa y cargo, y una breve reflexión sobre cuál es para la persona una prioridad en materia de adaptación climática. Las prioridades mencionadas incluyeron temas variados como la gestión integrada del agua, la creación de resiliencia ante las sequías y las inundaciones, fortalecimiento de planes de ordenamiento territorial, gestión de alianzas estratégicas, incrementar la capacidad de adaptación de las comunidades a través de herramientas haciéndolos partícipes de la toma de decisiones, optimización de nuestra red de datos hidrometeorológicos, así como lo relativo a la comunicación y difusión de información al público en general y el fortalecimiento de capacidades de los equipos técnicos y comunidades para la resiliencia, entre otras.

Presentación de las entidades social del proyecto. Brevemente y a fin de facilitar el entendimiento de los participantes de las distintas entidades involucradas en el proyecto y el rol de cada una, Luis Roberto Silva de la OMM inició con una presentación sobre cómo la OMM apoya la hidrología operativa que va desde la adquisición y la gestión de datos, la generación de información con dichos datos y la difusión de la información, acompañado del desarrollo de capacidades y educación, ciencia e innovación y guías, reglamentos, normas, control de calidad, para apoyar a los países para fortalecer su hidrología operativa. Se explicó sobre los vínculos con la Iniciativa de Alerta Temprana para Todos (EW4All) y se comentaron otros aspectos y herramientas relevantes de la gestión de OMM como la guía sobre Predicción Hidrológica Estacional; las guías de evaluación para la predicción de inundaciones y sistemas de alerta temprana E2E; el reporte sobre los recursos hídricos a nivel mundial que va en su tercera edición; el portal para la evaluación de recursos hídricos; herramientas como el DWAT para gestión de recursos hídricos; un Helpdesk para inundaciones y sequías entre otras iniciativas para fortalecer la infraestructura hidrometeorológica y la herramienta HydroSOS, entre otras. La presentación completa está disponible [aquí](#).

Por su parte, el Sr. Maximiliano Campos dirigió unas breves reflexiones para explicar el involucramiento del Comité Regional de Recursos Hídricos (CRRH) en el proyecto, resaltando el apoyo brindado a los países por más de 60 años. Indicó que el CRRH es la secretaría de recursos hídricos del sistema de integración centroamericano, creado inicialmente con una visión de corte más ingenieril para sistematizar toda la información hidrometeorológica de Centroamérica, migrando a través del tiempo hacia una visión más integral y ecosistémica con plena vigencia actual. Resaltó entre otras iniciativas el Centro-Clima, que básicamente resume la información meteorológica e hidrológica de todos los países centroamericanos, conectando actualmente a Belice y próximamente a la República Dominicana, integrando a más de 172 estaciones en toda la región; además del centro virtual de tiempo atmosférico severo, el monitoreo regional de sequías, guía para inundaciones repentinas, los foros hidrológicos,

información integrada de todos los escenarios regionales, entre otras herramientas puestas por el CRRH al servicio de toda la región. La presentación completa está disponible [aquí](#).

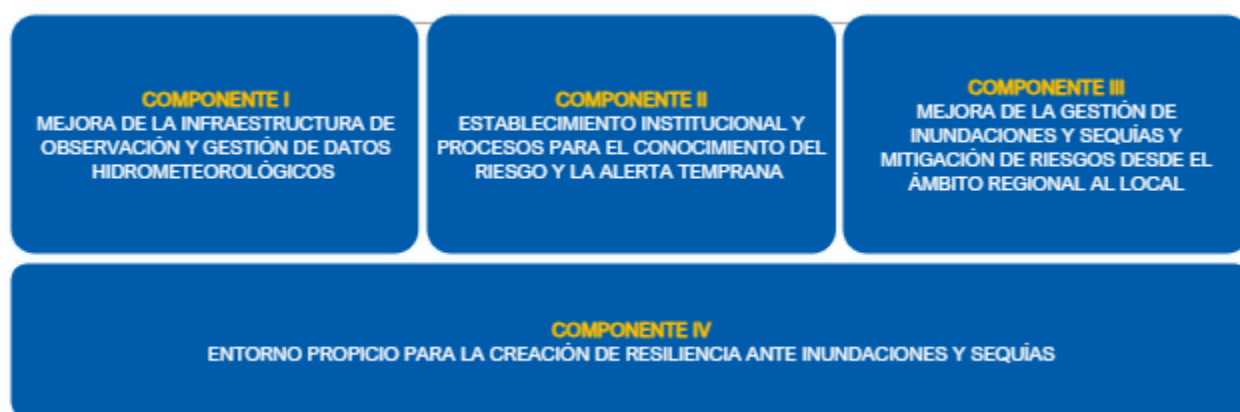
Para finalizar el bloque, la Sra. Fabiola Tábor compartió información sobre la Global Water Partnership, una red de acción internacional con la visión de un mundo con seguridad hídrica. La alianza tiene presencia en todo el mundo, organizada en regiones. Para la región de Centroamérica la oficina está basada en Honduras desde donde apoyan los distintos países de la región y mantienen una activa coordinación con las secretarías del sistema de integración centroamericana. La Alianza cuenta con una estrategia vigente 2020-2025, la cual está en proceso de actualización manteniendo los 3 pilares temáticos: proveer soluciones en materia de agua al desarrollo, catalizar un desarrollo resiliente al clima y mejorar la cooperación transfronteriza, junto a 3 temas transversales: movilizar a la juventud, promover la igualdad de género y movilizar al sector privado. A través del primer pilar sobre provisión de soluciones en materia de agua al desarrollo apoyan a los países a fortalecer su gobernanza y fortalecer los instrumentos que se tienen para la aplicación de la gestión integrada de los recursos hídricos. Una acción clave ha sido apoyar en la evaluación de la meta 65, específicamente el indicador 651, que tiene que ver con el nivel de implementación de la gestión integrada de los recursos hídricos en los países. Se ha brindado apoyo para la elaboración de los planes de acción para la gestión integral de los recursos hídricos de Guatemala, Nicaragua y Panamá, e iniciando con el apoyo a El Salvador. Otras iniciativas incluyen una guía para evaluar la sequía a nivel municipal o a nivel local en Nicaragua que incluso se ha utilizado a nivel de cuenca; fortalecimiento de capacidades en la evaluación de la meta sobre eficiencia y escasez de recursos hídricos en coordinación con la FAO. En materia de cooperación transfronteriza resaltó iniciativas para fortalecer capacidades a nivel latinoamericano; desarrollo de documentos sobre el estado de la región en materia de cooperación transfronteriza para impulsar un proceso de diálogo regional multiactor en coordinación con la CCAD; documento de lineamientos y principios para impulsar la gestión en la cooperación en las cuencas transfronterizas en la región. Resaltó también el liderazgo de Panamá en materia de agua al ser el primer país en Latinoamérica que ha suscrito el Convenio del Agua. Brevemente comentó sobre apoyos puntuales a países en torno a las NDCs, por ejemplo, en Panamá el apoyo al plan de adaptación al cambio climático en el sector marino costero. Resaltó las iniciativas de gestión del conocimiento sobre cambio climático, por ejemplo, un estudio en Honduras junto con UNICEF para identificar los impactos de la sequía en el sector agua potable y saneamiento y la coordinación de dos comunidades de práctica en el tema de gestión de sequía, entre otras iniciativas. La presentación completa está disponible [aquí](#).

4.1 Exposiciones de contenido y plenarias

Este bloque fue conducido por los consultores José Alfredo Garza y Mario López con el objetivo de que los participantes conozcan a profundidad cuáles son las orientaciones, las perspectivas y los diferentes objetivos del proyecto, de manera que puedan involucrarse desde las áreas de competencia de sus propias instituciones.

Presentación inicial sobre antecedentes y estructura general del proyecto. Se comentó sobre el trabajo detallado realizado en el contexto de la Cooperación Técnica OMM-BID entre 2021 y 2023 para la evaluación de capacidades en torno a la cadena de valor hidrometeorológica para la formulación de una hoja de ruta orientada a fortalecer el desarrollo y provisión de servicios hidrometeorológicos e identificar cuáles eran las áreas potenciales de ser fortalecidas dentro de las instituciones nacionales en Costa Rica y Panamá responsables de desarrollar productos y servicios en la cadena de valor

hidrometeorológica, resaltando como un hito clave para Panamá la creación del IMHPA. El proceso permitió desarrollar un diagnóstico del estado de la institución y de las necesidades, reflejado en una hoja de ruta a 10 años (2023 a 2033) por un monto aproximado de US\$148 millones y enfocada en 2 temas principales: identificar cuáles eran las necesidades prioritarias del Instituto a ser fortalecidas y acompañar la implementación, incluyendo 4 líneas de acciones: fortalecimiento y desarrollo institucional , fortalecimiento de la infraestructura, fortalecimiento del pronóstico y la vigilancia hidrometeorológica y climática y acciones para el desarrollo e implementación de servicios. Se identificaron las 3 prioridades para Costa Rica y Panamá así: establecer una red nacional de observación, desarrollar el sistema de gestión de base de datos y desarrollar un observatorio de sequías e inundaciones. Se indicó que al momento de plantear la propuesta a presentarse al Fondo de Adaptación fue necesario aplicar el enfoque sistémico e integral, identificando de qué forma se interrelacionan cada una las prioridades y líneas de acción, y abordando la solución del problema desde el punto de vista técnico científico, así como también las cuestiones de gobernanza, de coordinación interinstitucional, y el aseguramiento de la participación de todos los involucrados en el fenómeno. A partir de dicho análisis integral se definieron los 4 componentes del proyecto regional con sus respectivos resultados esperados, productos y actividades.



Seguidamente se procedió a presentar en detalle el contenido del primer componente del proyecto por los consultores. La presentación con los 4 componentes, sus resultados, productos y actividades está disponible [aquí](#).

Presentación del Componente No. 1: Mejora de la infraestructura de observación y gestión de datos hidrometeorológicos



Plenaria No. 1. Al término de la exposición del primer componente se abrió una plenaria de preguntas y respuestas con la audiencia sobre lo compartido en torno al proyecto general y el componente 1. A continuación se presentan los puntos clave de la Plenaria No. 1:

- a) Pregunta sobre el alcance y la selección de las cuencas, si es a nivel nacional o empezará con las cuencas prioritarias, así como confirmar si se consideró el aspecto de la protección de las estaciones ante situaciones de vandalismo. Se clarificó que sí, que el diagnóstico que se va a realizar de las de las redes y de las necesidades de ubicación de nuevas estaciones, si es que es pertinente, va a abarcar todo el país, lo cual es complementario a lo que ya está definido en en la Hoja de ruta. Dado que los recursos del proyecto son limitados, se comentó que hay que ser estratégicos en términos de en dónde se van a ubicar las estaciones, y en ese sentido lo que se plantea es que se destinen para las cuencas en donde se van a implementar las iniciativas piloto que están contenidas en el componente 3 del proyecto. El recurso que va a estar disponible para las estaciones aproximadamente alcanzará para unas 5 o 6 estaciones únicamente, lo cual no sule toda la necesidad del país en términos de mejorar la red y la cobertura. Ante esta situación con el proyecto se busca fortalecer los sistemas de alerta para crecidas, inundaciones empezando en sitios donde se pueda tener la injerencia más rápida.
- b) A la pregunta sobre si se consideró la optimización de las estaciones existentes, se indicó que el rediseño de las redes va orientado para ampliar la cobertura, pero también para modernizar la infraestructura con la que actualmente se cuenta. El tipo específico o el equipamiento específico que va a integrar estas redes que se van a aportar a través del proyecto quedará definido en el estudio de las redes nacionales.
- c) Sobre los criterios para la selección de las 2 cuencas prioritarias en Panamá, se indicó que el tema se detallaría más adelante en el taller incluyendo una explicación por e IMHPA, pero que en general los criterios incluyeron: los impactos históricos de sequías e inundaciones en las cuencas, o sea, cuánto son las pérdidas, los daños, etcétera; la frecuencia de las afectaciones, los equipos ya desplegados en la cuenca y la información, estudios que existen; el potencial de sostenibilidad del sistema en el tiempo y las actividades productivas de la cuenca; existencia de una gobernanza básica en la cuenca; sectores beneficiarios de la información y el conocimiento; la importancia política y visibilidad institucional que generaría el proyecto en esas cuencas.
- d) Comentario sobre los resultados del proyecto ejecutado por la Fundación Natura con financiamiento de Fondo de Adaptación, indicando que con el proyecto se establecieron 43 estaciones agro meteorológicas, cuatro estaciones hidrológicas y una estación GOES receptora de datos, todas las cuales son relativamente nuevas y constituyen un referente importante; además el proyecto también contempló un pequeño sistema de alerta temprana. Se indicó que ambos componentes se trabajaron con el equipo de MiAmbiente y del MIDA. También se comentó sobre el desarrollo de una nueva propuesta para el Fondo de Adaptación que está en evaluación por el Comité Técnico de la Secretaría del Fondo y que incluye un componente de instalación de estaciones específicamente 2 estaciones para tsunami en el área de Chame y todo el sector del litoral. Importante establecer comunicación con el equipo que está desarrollando el proyecto para evitar duplicaciones. El equipo consultor comentó además tener conocimiento otra propuesta que se está trabajando con el Fondo

de Adaptación para Panamá, Costa Rica y República Dominicana, con lo cual se constató que hay 3 iniciativas en desarrollo para ser presentadas ante el Fondo de Adaptación, lo cual requiere asegurar coordinación y cooperación y evitar duplicidades.

- e) ¿Qué medidas se han contemplado para evitar retrasos en la formulación e implementación del proyecto? Se clarificó que en la hoja de ruta el ejercicio de planificación para el IMHPA se planteó como un posible horizonte del 2023 al 2033, pero implementar ese proyecto depende específicamente de que el IMHPA cuente con los recursos, el personal, el recurso financiero que es el objetivo principal de este proyecto con el objeto de empezar la implementación de las áreas que fueron identificadas como más prioritarias dentro de la hoja de ruta. El retraso que puede darse en esta iniciativa depende sobre todo de los tiempos que se manejan en el Fondo de Adaptación, considerando que el proceso incluye el someter la nota de concepto y posterior a su aceptación desarrollar y presentar la propuesta completa. Para mejor ilustrar este punto, Luis Roberto S. procedió a presentar la siguiente línea de tiempo y pasos ante el Fondo de Adaptación del proyecto:



Se clarificó que esta línea de tiempo incluye que en Mayo del 2025 se envía la nota de concepto al Fondo de Adaptación, ya que existen rondas de retroalimentación por parte del Fondo que normalmente tarda de 1 a 3 meses; debería estar aceptado técnicamente para que en la reunión de Octubre de la Junta del Fondo de Adaptación se pueda aceptar de manera oficial la nota de concepto. En ese interim, se tiene que empezar a trabajar en la nota de proyecto, para enviarla al Fondo en Diciembre de 2025, esperando que la aceptación técnica se daría en Enero y que en la reunión de Marzo del 2026 se acepte formalmente la nota de proyecto, para iniciar el proyecto en Agosto del 2026. En caso de algún retraso, es muy posible que la nota de proyecto se presente en Mayo del 2026, se acepte en Octubre del 2026. Se destacó que en este primer proceso de aprobación de la pre nota conceptual por el Fondo fue muy positivo y no hubo comentarios del de la parte técnica del contenido; la retroalimentación fue sobre otros detalles, pero la propuesta en sí fue muy bien vista y muy bien aceptada.

- f) Comentario sobre la temporalidad de los Foros del Clima, indicando que se realizan regionalmente los pronósticos que se hacen trimestralmente a nivel regional, y la deseabilidad de poder ajustarlos a las necesidades del sector en función de que generalmente inician muy cercano al ciclo de producción, no solamente de Panamá, sino de creo que gran parte de Centroamérica. En el caso de

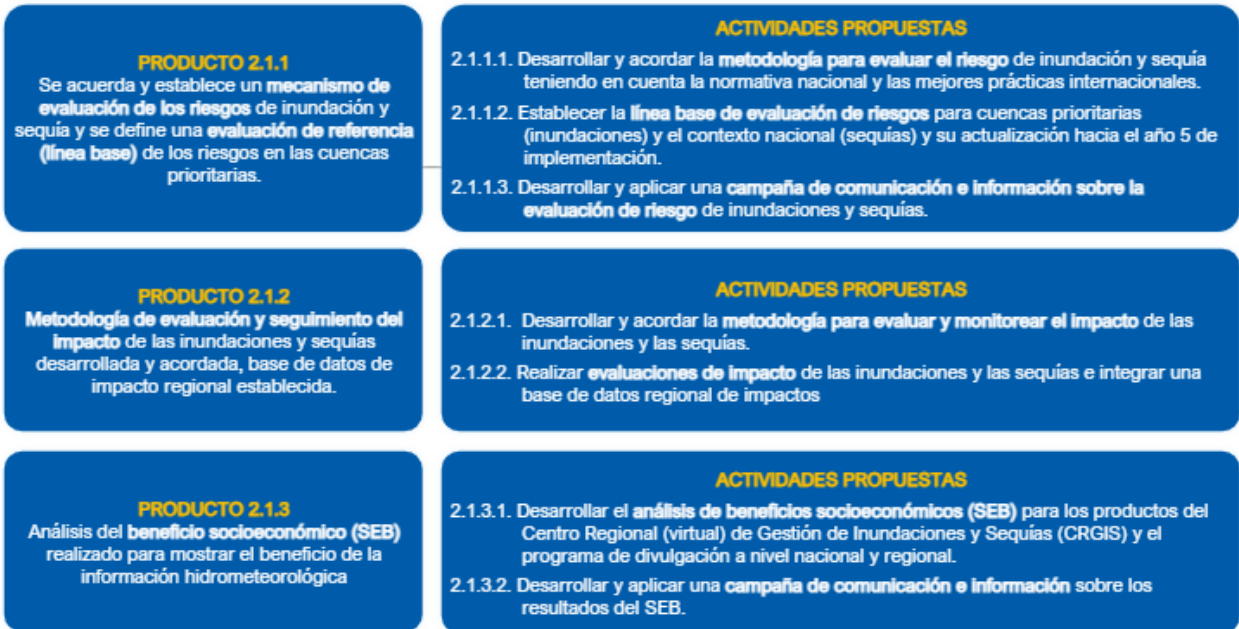
Panamá se inicia el ciclo de producción a nivel nacional a mediados de abril y entonces la información llega cuando ya se está trabajando, preparación de suelo y definiendo los cultivos que se va a sembrar. También se comentó sobre la importancia de la información que se recibe de las estaciones agro meteorológicas porque es una información valiosa que permite tomar decisiones en las mesas técnicas de trabajo se realizan cada 3 meses en el en todo el país. Sobre esto, el equipo de proyecto comentó que el proyecto plantea línea para fortalecer los foros climáticos y foros regionales del clima, de manera que se pueda abordar esta y otras observaciones. Otra instancia relevante son las mesas agroclimáticas regionales desarrolladas con el Consejo agropecuario centroamericano y las que se desarrollan a nivel de cada país. En el caso de Panamá, el MIDA participa en ambas instancias a través del CAC y del Grupo Técnico de Cambio Climático y Gestión de Riesgos del sector agropecuario nacional. Igualmente se participaba de las mesas regionales que se hacían anteriormente en tema de gestión de riesgos, sanidad agropecuaria, agricultura y café, en las que se generaba información muy valiosa para los países, pero que se han dejado de realizar.

- g) Por parte del IICA se comentó sobre una herramienta que han desarrollado para traducir esas señales de alerta de sequía en una aplicación que le llega al agricultor con un sistema GPS, la cual se podría incorporar en el piloto de las cuencas del proyecto. Tienen una experiencia interesante de aplicación en el cultivo del arroz que lleva prácticamente 2 años de desarrollo e historia y datos que se pueden incorporar a este proyecto piloto para llevar el análisis de cuenca y meteorológico al productor final.
- h) Se comentó sobre los porcentajes que permite el Fondo para infraestructura y equipamiento, los cuales son limitados. Se indicó que, hasta este momento, la componente de equipamiento del proyecto son aproximadamente US\$2,000,000 para los 2 países, que van a ser destinados tanto para las estaciones hidrometeorológicas como para el equipo informático que se requiere para implementar los sistemas de gestión. El proyecto propone aprovechar las estructuras, herramientas y sistemas que ya están disponibles en el contexto de la Organización Meteorológica Mundial porque son herramientas de código abierto que no implican un licenciamiento y que, además, pueden ser complementadas en la medida que sea necesaria para satisfacer la gestión y el aprovechamiento de los de los datos de acuerdo con lo que cada institución requiera. De acuerdo con las diferentes instituciones que van a ser los usuarios de esa de esa información, entonces, utilizando la plataforma de la OMM se creará una base de datos principal que en el caso de Panamá estaría dentro del IMHPA, y se crearían sub-bases de datos o bases de datos secundarias de acuerdo al Grupo Específico de Información que se requiera por las diferentes instituciones. Con esto se aprovecha que la OMM ha desarrollado toda una serie de capacidades que están integrados dentro de la plataforma que precisamente está orientada a homologar los protocolos y formatos que son requeridos para que los sistemas puedan intercomunicarse.

Presentación del Componente No. 2: Establecimiento institucional y procesos para el conocimiento del riesgo y la alerta temprana.

El componente 2 es la segunda parte después de tener los datos, el manejo de los datos, las bases de datos, para entrar a la dimensión del riesgo. ¿Qué tenemos en riesgo en términos de inundaciones y sequías? Los resultados y productos propuestos son los elementos necesarios metodológicos de impactos, cuánto vale el dato que se va a generar como parte del proyecto y cómo se va a comunicar.

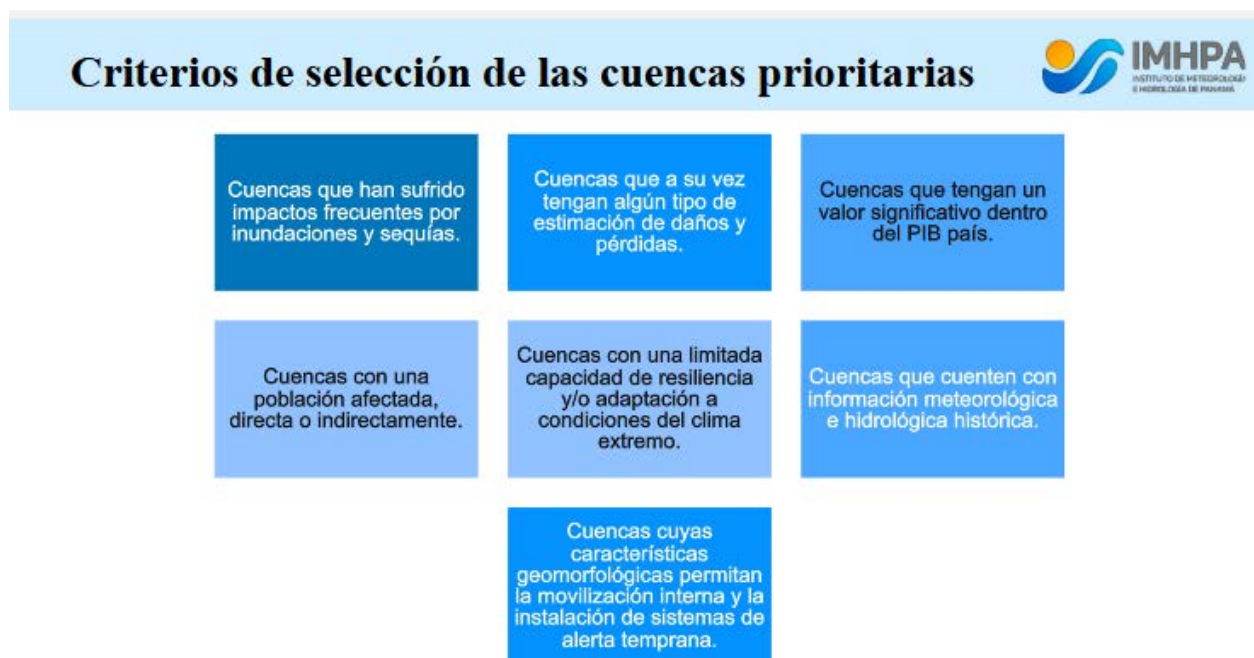
Las actividades son un reflejo de metodologías, una base de datos de impactos, una línea base de la vulnerabilidad, el tema del análisis socioeconómico, de la información que se va a generar y metodologías, procesos para garantizar que esta información llegue hasta la última milla, hasta el usuario final de esta cadena de valor.



PRODUCTO 2.2.1 Productos y servicios definidos y desarrollados de forma participativa con las comunidades y los usuarios finales , tanto a escala de cuenca (para las inundaciones) como a escala nacional/de cuenca (para las sequías).	ACTIVIDADES PROPUESTAS 2.2.1.1. Desarrollar y aplicar metodologías ajustadas de monitoreo de sequías e inundaciones y de pronósticos basados en impactos , teniendo en cuenta los niveles nacional, binacional y regional. 2.2.1.2. Diagnosticar, desarrollar e implementar los servicios y productos de información climática necesarios, con especial atención a las inundaciones y las sequías.
PRODUCTO 2.2.2 Productos sobre el estado y las perspectivas hidrológicas (de subestacionales a estacionales) para las cuencas prioritarias generados de acuerdo con las directrices internacionales y las necesidades de los usuarios finales a nivel sectorial.	ACTIVIDADES PROPUESTAS 2.2.2.1. Desarrollar un SIG colaborativo y una base de datos vinculada a la página web del CRRH para divulgar el estado hidrológico de las cuencas seleccionadas. 2.2.2.2. Elaboración de productos de perspectiva del estado hidrológico para las cuencas prioritarias y a escala nacional, respectivamente.
PRODUCTO 2.3.1 Establecimiento y aplicación de estructuras de comunicación y difusión de alertas centradas en la última milla y conectadas a los planes locales y nacionales de contingencia ante inundaciones y a los planes de sequía.	ACTIVIDADES PROPUESTAS 2.3.1.1. Elaboración de productos de previsión de inundaciones y sequías para las cuencas prioritarias y a escala nacional , respectivamente. 2.3.1.2. Desarrollo de productos específicos derivados de la vigilancia de la sequía y las inundaciones (protocolos de alerta temprana, umbrales de alerta, mejora de la resolución de la vigilancia de la sequía a nivel local, materiales de difusión para las inundaciones y para la sequía -por sector prioritario-)

Presentación sobre los criterios para la selección de las cuencas prioritarias por la Directora del IMHPA. La presentación completa está disponible [aquí](#).

Aspectos claves de la exposición incluyeron:



De estos criterios, el que se considera el más significativo es que las cuencas cuenten preferiblemente con información meteorológica, hidrológica, histórica. Se explicó que se analizaron 6 cuencas: Río La Villa (128); Río Tonosí (124); Río Parita (130); Río San Pedro (120); Río San Pablo (118); Río entre el Tabasará y San Pablo (116). Al evaluar los criterios antes listados para las cuencas analizadas se identificó que sistemáticamente las cuencas del R. Tonosí y la Cuenca del R. La Villa cumplían con los criterios, lo cual fundamentó su selección como cuencas prioritarias para el proyecto por parte del

IMHPA, decisión que se quiere someter a la retroalimentación y reacciones de los participantes del taller para su validación o ajuste.

Plenaria No. 2. Seguidamente se pasó a la segunda plenaria para intercambiar opiniones y reacciones a la exposición del Componente 2 enfocado en mejorar el conocimiento del riesgo de inundaciones y de sequías a nivel país, particularizando en las cuencas prioritarias y a la presentación del IMHPA sobre los criterios para la selección de las 2 cuencas prioritarias. A continuación, se presentan los puntos clave de la Plenaria No. 2:

- a) Uno criterio importante analizado por el IMHPA fue la ocurrencia de los 2 fenómenos, la ocurrencia de sequías y la ocurrencia de inundaciones, a partir de una base de datos de información histórica, determinando que el Río Tonosí y el Río a Villa son las 2 cuencas que mayores incidencias tienen de estos 2 fenómenos. Además de la ocurrencia, también es importante tomar en cuenta el tema del riesgo, es decir, identificar qué tan vulnerables son esas cuencas que está en riesgo, considerando que hay poblaciones, áreas naturales protegidas, áreas agrícolas y comunidades aisladas, biodiversidad, lo que hace necesario considerar también la variable económica, los pronósticos de los impactos, los criterios futuros desde el punto de vista meteorológico e hidrológico, además de la estructura de la divulgación.
- b) Los datos comentados por parte del Director del Centro de Operaciones de Emergencias del SINAPROC corroboraron la importancia del área de Tonosí, indicando una cifra de más de 700 viviendas afectadas con personas con discapacidad y mujeres embarazadas en los fenómenos de inundaciones. Se indicó que la institución ya no usa la plataforma de Desinventar, sino ArcGis 123 y que según sus mediciones de áreas y sectores inundables, actualmente la cuenca más afectada por inundaciones para el Sinaproc es la de Tonosí que tiene 2 rubros que son los más vulnerables: cacao y flores estamos. Además del parámetro de viviendas afectadas, también manejan información sobre número de personas afectadas, nivel de vulnerabilidad, recursos solicitados y costo económico de las pérdidas. Se indicó que cada vez que hay una emergencia, el Sinaproc decreta las alertas y los avisos de prevenciones con los datos que proporciona el IMHPA, y según el nivel de alerta activan los centros de operaciones de emergencias provinciales y dependiendo la magnitud del evento activan el nacional. Si se rebasa el nivel de respuesta entonces activa los Centros de Operaciones de Emergencia Provinciales, en los cuales hay representación de todas las de las instituciones. Indicaron que a nivel de información socioeconómica, manejan los datos con las número de cédulas de las personas, de manera que están en capacidad de suministrar por evento la cantidad de personas y el listado con números de cédula y número telefónico de todas esas personas que fueron afectadas y el nivel de afectación. Todas esas evaluaciones están georreferenciadas, de manera que no solo se levanta la encuesta, sino también crean estamos capas sobre el nivel de vulnerabilidad. Clarificaron que no manejan información relativa al sector agropecuario. A la pregunta de por qué el Sinaproc decidió adquirir ArcGis que es una herramienta licenciada, se indicó que la primera licencia la donó la Cepredenac y posteriormente el Sinaproc compró su propia licencia y la adaptan según las necesidades de la institución. Hoy día la información de evaluación de daños y necesidades se digitaliza.
- c) El representante del MIDA comentó que se cuenta en el ministerio con un departamento que se encarga de la georreferenciación en la base de datos del Ministerio, y se tiene levantada toda la data

de productores, a nivel nacional con georreferenciación de las parcelas. Un rubro especial es el arroz por la ley de granos que establece las compensaciones que se les da a los productores de arroz. El caso de la provincia de Los Santos es importantísimo donde se produce alrededor del 12 al 13% de la producción de arroz del país. Y una de las limitantes o mayores riesgos es el área en el área de Tonosí que es impactada económica y ambientalmente cuando se dan los eventos extremos de inundaciones. Se comentó que además el Ministerio participa en la plataforma del CIGAP y la oficina Geoespacial agropecuaria está levantando un sistema a través de Copérnico para el monitoreo de las variables climáticas y el monitoreo de cómo las parcelas se ven afectadas por el efecto de la inundación y por la sequía. Incluso se indicó que se ha probado la herramienta Copérnico con los arroceros de Tonosí. Igualmente, el Ministerio cuenta con una base de datos a través del sistema ASIS para granos básicos, arroz, maíz, frijol y pasto para identificar las áreas más propensas o más vulnerables a sequía, información que sirve para generar mapas. Ambos representantes del MIDA expresaron acuerdo con la selección de la cuenca de Tonosí.

- d) El representante de la Dirección del cambio climático del MiAmbiente comentó sobre la relevancia del proyecto cuenca resiliente que está en ejecución e incluye un análisis del riesgo y la vulnerabilidad en 10 cuencas priorizadas del país, entre las cuales hay coincidencia con las 2 cuencas que se han priorizado en este proyecto. Dependiendo del resultado de los análisis de riesgo y vulnerabilidad, se seleccionarán 3 para implementar medidas de adaptación basadas en ecosistemas. Otro elemento relevante es el Atlas de Riesgo, que incluyó data del IMHPA, ACP, Aeronáutica civil, Sinapro, entre otras instituciones, y que identifica el riesgo de sequía por alteración del régimen hidrológico. El Ministerio está en la disponibilidad de compartir esta información. Se indicó que hacer referencia a la existencia de esta información es importante al nivel de la nota de concepto y que posteriormente la data misma será un insumo clave para la etapa de la elaboración de la propuesta completa.
- e) El equipo consultor comentó que todos los avances que se tienen y se han compartido son sumamente importantes, toda vez que la intención del proyecto es aprovechar todas estas capacidades que se han desarrollado. Para fines de la implementación de la propuesta y, sobre todo, viéndolo desde el punto de vista de sostenibilidad, durante la implementación o incluso durante la misma preparación, es deseable que se revise más en detalle las alternativas con respecto a plataformas disponibles. El licenciamiento, bien o mal, implica un riesgo en términos de la sostenibilidad, entonces la aplicación y utilización de herramientas que son de libre uso y código abierto, permiten una ampliación de sus capacidades y pueden por tan a la sostenibilidad de lo que se desarrolla en el proyecto.
- f) Al término de la plenaria, se logró un consenso sobre la importancia estratégica de las cuencas del río Tonosí y del río La Villa, luego de lo cual se avanzó a la presentación del componente 3 del proyecto.

Presentación del Componente 3: Mejora de la gestión de inundaciones y sequías y mitigación de riesgos desde el ámbito regional al local. En este componente se aborda lo relativo a la planificación, los planes a nivel nacional y a nivel de cuenca, así:



PRODUCTO 3.1.1 Establecimiento de un Centro Regional de Gestión de Inundaciones y Sequías (VIRTUAL) (CRGIS), que desde el ámbito regional integre y gestione las perspectivas y productos de los SMHN's y proporcione conocimientos, datos e información sobre sequías e inundaciones y los riesgos asociados.	ACTIVIDADES PROPUESTAS 3.1.1.1. Fortalecer la capacidad instalada (personal) regional (CRRH) (incluye 2 profesionales - uno por país y un programa de desarrollo de capacidades) 3.1.1.2. Adquisición de equipos informáticos para la operación del Centro de Gestión de Inundaciones y Sequías en el CRRH (componente regional) 3.1.1.3. Desarrollar e implementar un protocolo para garantizar la O&M del CRGIS con la participación coordinada y asistencia de los países.
PRODUCTO 3.1.2 Acuerdos institucionales y grupos de trabajo establecidos bajo el paraguas del CRGIS, así como, en su caso, en el ámbito nacional y local.	ACTIVIDADES PROPUESTAS 3.1.2.1. Establecer grupos de trabajo binacionales/regionales, nacionales y/o locales; desarrollar sus planes operativos. 3.1.2.2. Apoyar la puesta en marcha y operación de los grupos de trabajo de acuerdo con sus planes operativos.
PRODUCTO 3.2.1 Establecimiento de planes nacionales contra la sequía y/o apoyo a su aplicación que integren a todos los sectores pertinentes con un enfoque que abarque a toda la sociedad.	ACTIVIDADES PROPUESTAS 3.2.1.1. Desarrollar/actualizar/implementar planes contra la sequía en Costa Rica y Panamá 3.2.1.2. Integrar un plan regional (binacional) de sequía con especial atención a las cuencas transfronterizas.
PRODUCTO 3.2.2 Establecimiento de planes nacionales contra las inundaciones que integren a los sectores pertinentes con un enfoque que abarque a toda la sociedad.	ACTIVIDADES PROPUESTAS 3.2.2.1. Desarrollar participativamente planes contra las inundaciones en Costa Rica y Panamá 3.2.2.2. Integrar un plan regional (binacional) de inundaciones con especial atención a las cuencas transfronterizas.
PRODUCTO 3.2.3 Sistema de apoyo a la toma de decisiones implantado a escala nacional para la gestión integrada del agua.	ACTIVIDADES PROPUESTAS 3.2.3.1. Vincular HydroBid e HydroSOS en Costa Rica y Panamá y difundir la plataforma y los resultados con las agencias nacionales del agua a través de un SSD existente/mejorado. 3.2.3.2. Reforzar los foros hidrológicos y climáticos a nivel nacional, transfronterizo y local mediante el establecimiento de eventos bianuales.
PRODUCTO 3.3.1 Establecimiento de planes comunitarios de gestión de inundaciones, incluidos planes de contingencia, en las comunidades vulnerables.	ACTIVIDADES PROPUESTAS 3.3.1.1. Desarrollar planes de gestión de inundaciones (hojas de ruta, planes de acción específicos y protocolos) a nivel de cuenca - Costa Rica y Panamá
PRODUCTO 3.3.2 Elaboración de planes comunitarios de gestión del riesgo de sequía resilientes al clima para comunidades vulnerables.	ACTIVIDADES PROPUESTAS 3.3.2.1. Desarrollar planes de gestión de la sequía (hojas de ruta, planes de acción específicos y protocolos) a nivel de cuenca - Costa Rica y Panamá.
PRODUCTO 3.3.3 Ejecución de proyectos piloto en cuencas prioritarias para reducir el riesgo de sequía e inundaciones en las comunidades más vulnerables, dando prioridad a las soluciones basadas en la naturaleza.	ACTIVIDADES PROPUESTAS 3.3.3.1. Implementar planes de sequía e inundaciones (aprovechando elementos de los demás componentes: acuerdos institucionales, infraestructuras, metodologías, protocolos, productos y servicios, formación).

Plenaria No. 3. Seguidamente se pasó a la tercera y última plenaria del día para intercambiar opiniones y reacciones a la exposición del Componente 3. A continuación, se presentan los puntos clave de la Plenaria No. 3:

- a) Se comentó sobre la importancia de incorporar en la fase siguiente de elaboración de la propuesta completa a los Comités de Cuenca de ambas cuencas priorizadas, y con ellos llegar a un consenso de sus necesidades y cómo el proyecto va a cubrir esas necesidades. El proyecto sigue una lógica de primero lograr datos organizados, mejorados, identificados para iniciaciones y sequías; luego con el Componente 2 desarrollar metodologías para evaluación de riesgo de sequías e inundaciones y luego con el Componente 3, planificación a nivel nacional y a nivel de cuenca, ya que no es posible planificar si no se cuenta con una evaluación y diagnóstico de los problemas y si no se cuenta con información básica que permita prever un futuro planificado en cuencas y a nivel nacional para las inundaciones y sequías.
- b) El representante del IDIAP llamó la atención de considerar los trabajos que está realizando el CATIE en materia de mapas de cosecha de agua.
- c) Se resaltó la importancia de la regionalidad y el valor agregado que trae, por ejemplo, en materia de backup en caso que algo salga mal en algunos de los países; establecimiento de comunidades de práctica; estandarización de metodologías comunes, entre otras, clarificando que los recursos que se invierten en las instancias regionales regresan a los países en forma de servicios y asistencia.
- d) Se comentó sobre la existencia de programas binacionales Panamá Costa Rica, por ejemplo en la cuenca del R. Sixaola y en el Parque Internacional de la Amistad (PILA). El proyecto puede aprovechar estas experiencias de trabajo binacional y construir sobre ellas. Por ejemplo, SINAPROC mencionó una colaboración binacional con Costa Rica instalando algunos equipos de alerta temprana y equipos de radio base en el río Sixaola, incluyendo además la sensibilización a las comunidades, en prevención y mitigación.
- e) Cabe destacar que dentro del proyecto y para reforzar la perspectiva regional binacional, se contempla la realización de una planificación en una cuenca transfronteriza, siendo la cuenca del Río Sixola una que ha sido mencionada tanto por Panamá como por Costa Rica.
- f) Sobre los planes nacionales de inundación y sequía que se plantean en la nota de concepto, se indicó que se debe explicitar la alineación y la congruencia que tiene esta propuesta con respecto a instrumentos de planificación que estén desarrollándose o que hayan sido desarrollados en el nivel nacional, por ejemplo, en el contexto de las estrategias de cambio climático, de biodiversidad o de lucha contra la desertificación. Específicamente se va a apoyar el poder complementar o actualizar, en su caso, los planes que ya existan vinculados con la atención de sequías e inundaciones.
- g) Se enfatizó el rol del IMHPA como líder en el manejo de los datos, incluyendo la red de estaciones meteorológicas hidrológicas nacional. En este sentido, se hizo un llamado para trabajar integradamente entre las instituciones, no atomizados, de manera que si una institución elabora un proyecto que tiene que ver con información, con datos, debe tomar en cuenta al IMHPA. El IMHPA es el custodio, dueño y el maestro de los datos y desde la perspectiva de esta iniciativa es la columna

vertebral de todo, al ser el encargado de los datos y de la vigilancia del pronóstico. Y ese pronóstico y vigilancia tiene que ser retroalimentado con los impactos que efectivamente ocurren, con los datos de campo, para que entonces la vigilancia y el pronóstico se vuelva mucho más precisa.

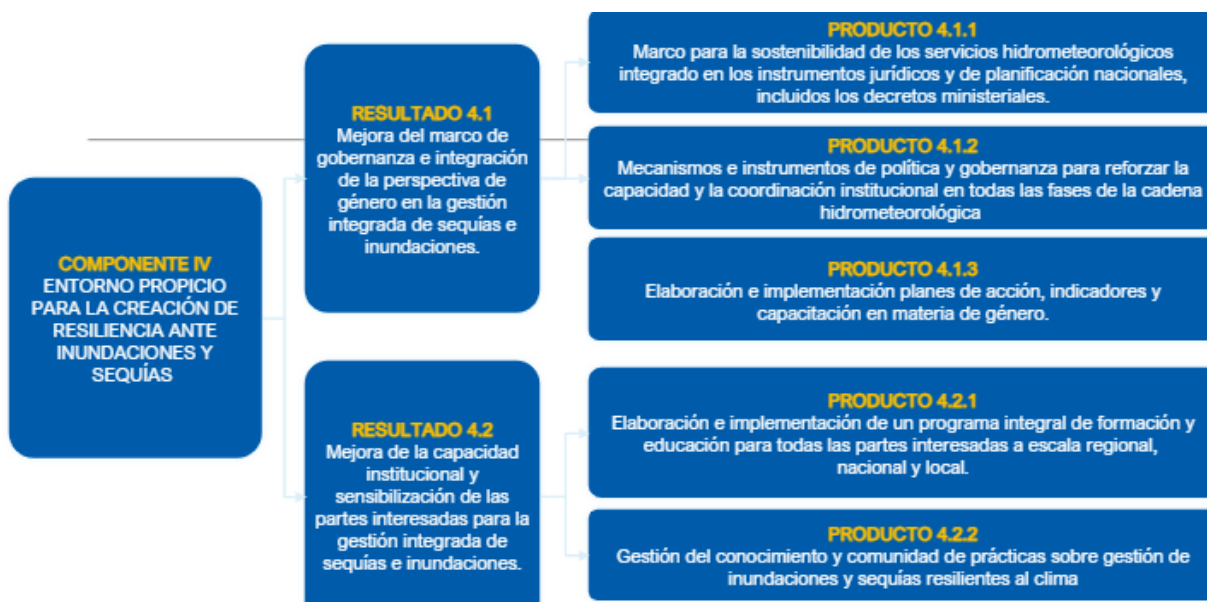
- h) Comentario sobre el valor de la homologación que provee la escala regional del proyecto. Por ejemplo, la OMM cuenta con dos programas orientados a homologar cómo se enfrenta la sequía; cómo se enfrenta la inundación a partir d una homologación del monitoreo de la amenaza, una homologación de cómo se caracteriza el riesgo ante inundación y sequía, su vulnerabilidad ante inundaciones y una planificación de cómo enfrentarlo, llevándolo hasta el nivel de localidad, que es lo que se está tratando de hacer con el proyecto.

Día 2. Martes 18 de febrero.

Se inició con una breve recapitulación de los puntos abordados el día anterior y revisión de las prioridades climáticas expresadas por cada uno. Seguidamente se repasó la agenda del día, indicando que luego de la presentación del componente 4, el énfasis del día sería el trabajo grupal para profundizar en preguntas puntuales relacionadas con los componentes y ejes transversales el proyecto.

Presentación del Componente 4: Entorno propicio para la creación de resiliencia ante inundaciones y sequías.

El componente se refiere a crear un ambiente propicio para que se pueda implementar el proyecto, siendo uno de los aspectos claves el tema de la gobernanza, entendida esta como todos aquellos arreglos institucionales, atribuciones institucionales, decretos ministeriales, decretos presidenciales, acuerdos interinstitucionales. Aborda también la perspectiva de género, así:





Plenaria No. 4. Seguidamente se pasó a la primera plenaria del día para intercambiar opiniones y reacciones a la exposición del Componente 4. A continuación, se presentan los puntos clave de la Plenaria No. 4:

- a) El representante del MIDA comentó que lo presentado se ajusta a la realidad nuestra nacional. Enfatizó sobre la dimensión de sostenibilidad y la sistematización de los resultados, a falta de las cuales se pierden los resultados y no es posible replicarlos o escalarlos a otras cuencas u otros territorios. Indicó también la existencia de un amplio marco legal y de instrumentos sobre sequía, por ejemplo, el Plan elaborado en el contexto de la Convención de las Naciones Unidas de Lucha contra la Desertificación; las gestiones que realiza el Comité Nacional del Cambio Climático que tiene que ver con todo el tema, incluyendo la escasez de agua para periodos secos; el Plan de Gestión de Riesgos a nivel nacional que también incorpora el tema de sequía como una de las amenazas; el Plan Sequía del MIDA, en función del cual cada vez que se dan eventos extremos de falta de agua hay que gestionar recursos para compensar el impacto. El resultado es que existen diferentes

plataformas para tratar los temas, pero no integradas unas con otras. Por el hecho de captar los fondos y manejar recursos, las instituciones no comparten ni los recursos ni la información y no se crea la sinergia que debiera existir. El proyecto debiera fomentar que se compartan las plataformas existentes y además revisar todas las normativas que de hecho ya existen para avanzar hacia la integración necesaria. Este proyecto debe ser de integración realmente; el componente 4 debe establecer la gobernanza para que el proyecto se ejecute de manera interinstitucional y que tenga sostenibilidad en el tiempo.

- b) Se indicó que es necesario avanzar hacia una integración colaborativa del manejo de los recursos hídricos. Igualmente establecer instancias formales de colaboración institucional. Igualmente se abordó la necesidad de enmarcar el proyecto en un marco más amplio de política pública para “blindar el proyecto” y asegurar la sostenibilidad.
- c) Los consultores compartieron su experiencia de haber revisado y evaluado varios instrumentos climáticos de Panamá, incluido el programa nacional de la Sequía para el combate a la desertificación elaborado por un consultor panameño, para identificar sinergias entre ellos y los resultados fueron alarmantes porque no están vinculados, sí se replican en otros instrumentos, pero no están vinculados y en los avances no se ven los resultados. Por tanto, este componente 4 es clave en cuanto a responder la pregunta de cómo implementar a nivel nacional y de la cuenca. También se comentó que este problema de trabajo en silos y sin comunicación ni coordinación interinstitucional, no es único de Panamá, sino que se da en muchos países, siendo un reto generalizado. Se citó a modo de ejemplo el caso citado por colegas de Costa Rica donde se compartió que la colaboración se da por razones de amistad y relaciones personales, y no en base a una formalidad del intercambio de datos o de informaciones para resolver los problemas. Y el problema aumenta cuando se piensa en el contexto de las comunidades: si nosotros aquí a nivel nacional e institucional tenemos dificultades para intercambiar información, ponernos de acuerdo y atender lo que dicen las normativas, a nivel local el problema tiende a agravarse. Se comentó que ciertamente en cuanto al tema de las competencias institucionales en nuestros países centroamericanos existe una tendencia a duplicar, sustituir, reiterar, reinventar, a reinvertir y que para el caso de Panamá, este proyecto tiene el potencial de servir para articular de manera efectiva entre lo que prevé los marcos de la gobernanza, tanto jurídicos, institucionales, financieros, de transparencia, de rendición de cuentas, y se convierta la atención de la sequía e inundaciones en sistemas eficientes al servicio de la población y la productividad.
- d) El representante de la ACP compartió su comprensión del proyecto y sus componentes, donde el componente uno se refiere a datos y base de datos; el segundo a la metodología y aspectos de vulnerabilidad; el tercero sobre planificación y dentro de ella el cómo anticiparse mediante la planificación a cualquier evento; el cuarto componente se refiere a la sostenibilidad del proyecto. En este componente 4 es necesario incorporar algo que “blinde” el proyecto, para que el mismo trascienda los gobiernos y se convierta en una iniciativa permanente. Menciona que el proyecto le gusta y que considera que está bien estructurado, pero que es clave incorporarle este elemento de sostenibilidad y permanencia. Se comentó que este comentario además del tema de sostenibilidad aborda el elemento de política pública para que no se quede solo a nivel de un proyecto más.

- e) Se comentó que el proyecto debe precisamente fortalecer instrumentos existentes y dotarlos de los arreglos institucionales que permitan su implementación. Se citó como ejemplo la existencia de las unidades ambientales sectoriales en función de las cuales la mayoría de las instituciones del país tienen un componente ambiental para tratar en su sector, en su competencia, sea el tema de cambio climático, el tema de variabilidad climática, gestión de riesgo u otro. Entonces se requiere un fuerte trabajo de fortalecimiento de las capacidades existentes respetando las competencias institucionales para facilitar la llegada al territorio con acciones concretas como las alertas tempranas. Para esto se puede contar con las capacidades con que cuenta la OMM a través de sus centros regionales e incluso considerar la idea de fortalecer alguna de sus instituciones de Panamá para fungir como centro regional, por ejemplo, para temas de hidrología.
- f) Se evidenció que el tema de sostenibilidad transita por 3 dimensiones: la de los recursos financieros; la de articulación y arreglos para la coordinación interinstitucional y la de capacitación y recursos técnicos y de conocimiento. En cuanto a la capacitación esta debe ser a todos los niveles, tanto de las instituciones como de los usuarios de la información a nivel comunitario porque ellos también tienen que aprender a cómo utilizar la información y tienen que estar conscientes de todo lo que implica el generar esa información. Eso le va a dar mayor fuerza a la cadena de valor hidrometeorológica. Esta es una de las estrategias que se plantea para la sostenibilidad y que no solamente se dependa de una o de un par de instituciones, sino que todos los actores que están involucrados en esa cadena participen activamente en la búsqueda de soluciones durante la implementación del proyecto y luego de su finalización.
- g) Para mapear todo esto se requiere un trabajo de diagnóstico que está incluido en las actividades. Cada uno de estas instituciones tiene una competencia en particular y cada una requiere de datos e información muy específica en el contexto precisamente de su mandato y de su área de competencia. Eso tendrá que analizarse para identificar claramente cuáles son estas necesidades y a la par generar un esquema de gobernanza y de cooperación interinstitucional para que el intercambio de información y de datos pueda fluir de manera adecuada y sin ninguna restricción, incluyendo en el caso de los pilotos a las autoridades locales y las comunidades usuarias.
- h) Se comentó sobre el potencial de la actividad relativa al establecimiento de comunidades de práctica para contribuir al proceso de capacitación y de gestión del conocimiento.
- i) La lógica transversal del componente 4 es precisamente para asegurar que se respetan las competencias institucionales y se dé la complementariedad. La Directora del IMHPA reiteró este punto y el potencial del proyecto para contribuir a la alineación entre las instituciones, tanto las presentes en el taller como las que aún no se han integrado, por ejemplo, la Autoridad de Turismo de Panamá y otras, y avanzar juntos para el cumplimiento de los compromisos que el país ha asumido.

4.2 Trabajos grupales

Según lo establecido en la pauta metodológica, el bloque de trabajo en grupos para profundizar en la discusión de temas específicos y transversales de la nota de concepto se dividió en 2 momentos.

El bloque se inició con las instrucciones para la conformación de los 5 grupos de trabajo utilizando la mecánica de numeración del 1 al 5, para procurar que los grupos tuviesen representantes de las distintas instituciones participantes. Se indicó que cada grupo contaría al menos con un funcionario del equipo del IMHPA incluyendo uno de los Directores de Área, a quienes correspondería el rol de moderador y relator de cada grupo. El moderador-relator inicia con un breve repaso del tema del grupo e invita a cada miembro a presentarse y dar una breve reflexión sobre el tema (1-2 minutos) y asegura que se recogen las ideas fuerza en papelógrafo que se utilizará para presentar en la plenaria.

Primera ronda de trabajo grupal: Temas transversales

1. Duración aproximada del ejercicio: 1 hora con quince minutos.
2. Grupos. Se conformaron 5 grupos así:
 - a. Aspectos vinculados con la gobernanza, las políticas públicas y legislación, incluyendo identificación de actores y usuarios clave, así como necesidades de formación y entrenamiento en estos temas
 - b. Aspectos vinculados con la perspectiva de género e intergeneracional, incluyendo identificación de actores y usuarios clave, así como necesidades de formación y entrenamiento en estos temas.
 - c. Aspectos vinculados con la coordinación interinstitucional y la comunicación, incluyendo identificación de actores y usuarios clave, así como necesidades de formación y entrenamiento en estos temas.
 - d. Aspectos vinculados con la sostenibilidad y el financiamiento, incluyendo identificación de actores y usuarios clave, así como necesidades de formación y entrenamiento en estos temas.
 - e. Aspectos vinculados con el monitoreo y la evaluación, incluyendo identificación de actores y usuarios clave, así como necesidades de formación y entrenamiento en estos temas.
3. Preguntas orientadoras para la discusión en todos los grupos:
 - a. El tópico transversal está debidamente incorporado/reflejado en el proyecto?
 - b. ¿Propósito? ¿Cuáles serían resultados esperados de este tópico transversal en el proyecto?
 - c. ¿Cómo? A través de qué medios/estrategias/acciones se puede incorporar o fortalecer la incorporación de este tópico transversal en el proyecto?
 - d. ¿Quién? ¿Qué organizaciones serían actores clave para intervenir en la planificación e implementación de este tópico transversal?

4. Resultados:

A continuación, se presenta la matriz consolidada de los resultados de los 5 grupos de trabajo. Los ítems que aparecen resaltados en color rojo son aquellos puntos-ideas que fueron priorizados por los participantes en la ronda final de “carrusel individual” en la cual se invitó a los participantes que, de forma individual, circularan por el salón y marcaran (o agregaran) aquellos puntos que consideran los más importantes/claves de la discusión. Para ello se facilitó a los participantes adhesivos de

estrella que cada uno fue colocando en los papelógrafos de resultados de los trabajos en grupo que permanecieron pegados en las paredes del salón. Con esto se logra identificar de manera muy visual aquellos aspectos que constituyeron los puntos fuertes de la conversación, a efectos de asegurar su consideración y/o incorporación en la nota de concepto.

Primer bloque de trabajo grupal: Ejes Transversales de la NdC

EJES TRANSVERSALES	GRUPOS				
	1 gobernanza, políticas públicas y legislación	2 perspectiva de género e intergeneracional	3 coordinación interinstitucional y comunicación	4 sostenibilidad y el financiamiento	5 monitoreo y evaluación
1.El tópico transversal está debidamente incorporado/reflejado en el proyecto?	Sí está bien reflejado y hay muchos elementos que contribuyen a esto. Actualmente el plan de gobierno el pilar cuatro de sostenibilidad ambiental y manejo responsable de los recursos naturales está enfocado en el manejo de las cuencas y se tiene además la ley marco de cambio climático, la NDC, el plan de seguridad hídrica 2015 al 2050 y el decreto de adaptación. Todos estos son legislaciones que existen y fortalecen este aspecto del proyecto	Sí está mencionado, pero no se encuentra incorporado debidamente, probablemente debido a que aún no está totalmente desarrollada la metodología	Sí está reflejado, pero debe ser fortalecido considerando aspectos interinstitucionales para el intercambio de información. Además, debe haber una mayor interacción entre las plataformas existentes, pues es sabido que muchas instituciones tienen sus propias plataformas y deben ser compartidas interinstitucionalmente lo que no se hace, y el proyecto debe contribuir a superar esto.	Sí el tópico estaba cubierto, pero es muy importante incluir y hacerle llegar el resultado de este taller a aquellas instituciones que no pudieron participar como IDAAN, Miviot, AMP, representantes de las comunidades, los dirigentes de cuencas prioritarias, etcétera.	Revisamos la nota de preconcepto y encontramos que no estaba incluido, debido a que la parte de MyE no se incluye hasta cuando está la propuesta completa, En ese momento la propuesta debe incluir un plan de seguimiento y evaluación presupuestado según las pautas establecidas por el Fondo de Adaptación y por las entidades implementadores y ejecutores, y cumplir también con las políticas ambientales, sociales y de género.
2. ¿Propósito? ¿Cuáles serían resultados esperados de este tópico transversal en el proyecto?	El propósito es que el proyecto se puede alinear con las políticas públicas existentes, evitando duplicidad en recursos a nivel	El propósito es que la información llegue a todos y que todos entiendan acerca del desarrollo del proyecto y que la Comunidad entienda	Propósitos: facilitar canales de comunicación; definir/clarificar roles institucionales; definición/clarificación de plataformas e	-Identificar a todos los usuarios claves para el proyecto y asegurar que llegue a todos los beneficiarios.	El propósito: es una herramienta de gestión responsable de proveer información sobre el desempeño para sustentar o mantener

	monetario y de recursos humanos.	en su totalidad la importancia de este proyecto y cómo pueden ser impactadas en sus tareas del día a día.	intercambios de comunicación y homologación de metodología para el análisis de información , facilitando que la información sea compartida interinstitucionalmente	-Formación para fortalecer capacidad -Establecer alianzas estratégicas para garantizar la sostenibilidad del proyecto Los recursos indicados en la nota de concepto no alcanzan para todo lo planteado, por lo cual es necesario buscar financiamiento externo adicional con entes multilaterales y organismos cooperantes adicionales, incluyendo donaciones por responsabilidad social, cooperación bilateral, banca de desarrollo (CAF, BID, BM, BCIE, entre otros)	la toma de decisiones y generar mejoras en las intervenciones y en la gestión, se realiza para asegurar que se tomen acciones oportunas cuando hay desviación en cuanto a la implementación tanto técnica como financiera. También para determinar la medición, las medidas para mitigar, evitar, minimizar o gestionar los riesgos ambientales, sociales y de género. Verificar si es necesario hacer ajustes a lo programado o implementar medidas adicionales para lograr el resultado deseado en el proyecto
3. ¿Cómo? A través de qué medios/estrategias/acciones se puede incorporar o fortalecer la incorporación de este tópico transversal en el proyecto?	Utilizando todos estos aspectos mencionados, todas estas leyes, dando una mayor docencia sobre ellas, una mejor divulgación y una fiscalización y control de las mismas.	A través de metodologías para desarrollar de manera local en las cuencas prioritarias. Realizando actividades de divulgación que involucren asistencia femenina, no solo de los hombres; realizar	A través de definición de acuerdos interinstitucionales , o sea, acuerdos, protocolos o convenios; -Definición de estrategias de interconexión de plataformas de información, no	A través de estrategias en el sector privado, responsabilidad social empresarial, convenios multilaterales, voluntad política para establecer presupuesto	El sistema de MyE se incorpora al proyecto mediante un plan que se elabora durante la fase de implementación. El plan debe incluir de acuerdo a como está en el sistema o a los estándares

		actividades amigables de todo tipo como agroferias que involucren a toda la familia para que la opinión de todos sea tomada en cuenta; utilizando horarios amigables y en ambientes seguros para toda la familia	solamente quedarnos con nuestros datos, sino buscar una manera de que esta información tenga una un solo formato para que pueda ser transmitida de institución a institución; -Definición de líneas bases de información por institución y plataformas que permitan que esta información involucre a las instituciones y llegue a las comunidades de una forma que les sea útil y oportuna y que incluso puedan intercambiar datos entre ellos	nacional; Alianzas públicas privadas, campañas de comunicación con mensajes dirigidos a la población.	establecidos por el Fondo de Adaptación, cómo va a ser la metodología de monitoreo, cómo se van a recopilar los datos o la data y cómo se van a analizar esos datos. -Se debe trabajar muy estrechamente con el equipo rector de la temática. -A través de informes de gestión o de avances a los donantes y beneficiarios desarrollados en base a las visitas de campo periódicas, inversiones y capacitaciones y otros puntos.
4. ¿Quién? ¿Qué organizaciones serían actores clave para intervenir en la planificación e implementación de este tópico transversal?	Vamos a iniciar con los que no están aquí presentes: MIVIOT, ATP, MOP, CONACCP, CONALSED, IDAAN, ONGs. Y las presentes en el taller: Idiap, MIDA, MiAmbiente, Sinaproc, Conep, ACP, MISA, MEF, IMHPA, Fundaciones y Grupos Comunitarios.	Incorporar a los líderes comunales que conozcan las necesidades de la comunidad y que puedan transmitir de forma amigable y entendible el proyecto. Técnicos regionales de instituciones como Sinaproc y MIDA. Incluir a las escuelas locales en los	IMHPA que está liderando, MIDA, Sinoproc, Miambiente, MEF, Cancillería, MINSA, IDAAN, gobiernos locales y algunas ONGs	IMHPA, ya que a través de su junta Directiva reúne a los 7 ministerios claves	Todos los ejecutores: OMM, GWP y CRRH. La unidad ejecutora sería responsable de consolidar los informes y reportar al FdA y a los beneficiarios

		programas de divulgación.			
Comentarios del equipo consultor y de los participantes	-Identificar otros nuevos instrumentos necesarios a desarrollar o implementar -Contribuye a alinear con los instrumentos identificados -Revisar los programas existentes sobre sequías e inundaciones -Esto ayuda a fortalecer las vinculaciones entre actores	- La dimensión y perspectiva familiar reiterada en cada punto pudiera ser un elemento diferenciador y novedoso. - Identificar necesidades específicas de mujeres y niñas	-El proyecto tiene una ambición muy importante de operativizar los canales de coordinación interinstitucional -Mucho de lo que se ha indicado tiene que ver con medios mecanismos, es decir, identificar cómo voy a transmitir la información. Habría entonces que enfocar en la homologación de la metodología para el análisis de la información. -No se trata solamente de transmitir información de impacto de lo que ya ocurrió, sino de lo que va a venir. Transmitir esta información es fundamental esto se facilita con metodologías homologadas. La transmisión de info tiene que usar distintos lenguajes de acuerdo a los distintos grupos de interés (comunidad rural, un agricultor, un industrial, proveedores	-Sería bueno colocar capacitación de formuladores, de proyectos en el componente de capacitación -Fortalecer capacidades para la ejecución presupuestaria -Considerar vínculo con MEF para traducir la info en términos económicos del costo evitado de daños y pérdidas es fundamental para la reinversión en la sostenibilidad -Considerar otras fuentes de recursos para el IMHPA por ejemplo, mediante alianzas público privadas para provisión de data específica sectorial a gremios/empresas; asignación de porcentajes por acceso a fondos de desastres y fondos de riesgo climático cuya sustentación se da en base a data	Al estar en la fase de nota de concepto, el requerimiento en cuanto monitoreo y evaluaciones es limitado; siendo un requerimiento clave al momento de avanzar en la fase de elaboración de la nota de proyecto que se presente al Fondo de Adaptación

			de servicios, comerciantes, etc) - Considerar un posible rol importante de la Autoridad Nacional de Innovación que tiene como misión apoyar procesos de homologación; esto ayudaría a evitar que cada institución siga invirtiendo en sus propias apps y plataformas. - También es clave saber con claridad qué datos son los que necesita el IMHPA de las otras instituciones	producida por el instituto, entre otras.	

Segunda ronda de trabajo grupal: Temas de la Nota de Concepto

1. Duración aproximada: 1 hora
2. Grupos: Se mantienen los grupos ya conformados, con un solo ajuste: se fusionan los grupos 1 y 5, para un total de 4 grupos de trabajo, así:
 - a. Identificación de impactos, beneficios y riesgos económicos, ambientales y sociales
 - b. Acuerdos de implementación y aspectos de sostenibilidad
 - c. Consideraciones de grupos vulnerables y de género
 - d. Alineación con el marco de resultados del Fondo de Adaptación y consistencia con estrategias nacionales y sub-nacionales (planes, comunicaciones, programas, etc.)
3. Preguntas orientadoras: El ejercicio en grupo abordó 3 dimensiones en torno al tema de la NdC:
 - 1) Identificar
 - 2) Incluir / eliminar / agrupar
 - 3) Priorizar

Por ejemplo: Tema 1:

- (Ver) Identificar/listar los impactos y riesgos ambientales y sociales recogidos en la NdC
- (Juzgar) ¿Estos son suficientes? ¿Es necesario incluir alguno? ¿Eliminar alguno? ¿Agrupar unos con otros?
- (Priorizar) De los impactos y riesgos ambientales y sociales identificados, ¿cuál es el orden de prioridad y por qué?

4. Resultados

A continuación, se presenta la matriz consolidada de los resultados de los 4 grupos de trabajo.

Lo mismo que en el bloque anterior, los ítems que aparecen resaltados en color rojo son aquellos puntos-ideas que fueron priorizados por los participantes en la ronda final de “carrusel individual” en la cual se invitó a los participantes que, de forma individual, circularan por el salón y marcaran o agregaran aquellos puntos que consideran muy importante/clave. Para esto se facilitó a los participantes adhesivos de estrella que cada uno fue colocando en los papelógrafos de resultados de los trabajos en grupo que permanecieron pegados en las paredes del salón. Con esto se logra identificar de manera muy visual aquellos aspectos que constituyeron los puntos fuertes de la conversación, a efectos de asegurar su consideración y/o incorporación en la nota de concepto.

Segundo bloque de trabajo grupal: Temas específicos de la NdC

TEMAS ESPECÍFICOS	GRUPOS			
Preguntas	1 y 5 fusionados Identificación de impactos y riesgos y beneficios económicos, ambientales y sociales	2 Acuerdos de implementación y aspectos de sostenibilidad	3 Consideraciones de grupos vulnerables y de género	4 Alineación y consistencia con estrategias nacionales y sub-nacionales (planes, comunicaciones, programas, etc.)
1. (Ver)Identificar/listar	Impacto social: disminución de la vulnerabilidad de la población ante sequías e inundaciones; Impacto económico: Disminución de pérdidas en la producción agropecuaria Beneficio social: aumento de la resiliencia ante inundaciones y sequía. Beneficio económico: generación de empleos directos e indirectos en las comunidades Beneficio ambiental: Más disponibilidad de información para el manejo ambiental de las cuencas. Riesgo social: Resistencia al cambio por parte de las comunidades que estén dentro de esas cuencas prioritarias Riesgo económico: sostenibilidad del proyecto a largo plazo Riesgo ambiental: posible alteración o intervención en los	El grupo identificó la celebración de Memorandos o Cartas de Entendimiento entre instituciones como un vehículo óptimo para propiciar la colaboración y coordinación interinstitucional, ya que se pueden formalizar sin mayores trabas burocráticas	El grupo enfatizó en identificar al segmento de los adultos mayores, personas con discapacidad; niños por edad. Para el caso de la cuenca del R. Tonosí cuentan con un censo de 2602 personas, incluyendo tanto menores como adultos, adultos mayores desagregado por sexo.	El Grupo identificó diferentes proyectos ya relacionados, por ejemplo, el proyecto de Natura de alertas tempranas que fue realizado por el IMHPA y Sinaproc; El plan de sequía correspondiente a el fenómeno de El Niño que es realizado por el MIDA; el Plan de sequía y el Atlas de Riesgo ambos realizados por MiAmbiente que contempla todos los fenómenos de riesgo, incluyendo inundaciones y sequías, incendios forestales, deslizamientos, etcétera; pronto contará además con una plataforma para implementar la evaluación del daño y contabilizar en dinero el costo económico, este esfuerzo está liderado por el Sinaproc, Meduca Miviot, MOP, entre otras. También se cuenta con la

	ecosistemas en sitios de observación			plataforma de ESRI que mapea a todas las personas afectadas en cualquier evento a través del Sinaproc. –En cuanto a los planes ejecutados, se cuenta con: la política nacional de gestión de riesgo, el plan estratégico de desastre, y el plan estratégico de gestión integral del riesgo y el plan nacional de respuesta, todos liderados por Sinaproc. Marco de recuperación de desastres a través del MEF; el plan nacional de recurso hídrico 2015-2050 y el programa de cuencas resilientes ambos liderados por MiAmbiente; el plan de acción para la gestión integrada del recurso hídrico y saneamiento de la Bahía de Panamá. Por parte del IMHPA se cuenta con el plan estratégico del IMHPA que se encuentra actualmente en revisión y también se está desarrollando la política nacional de meteorología e hidrología; el plan de acción durante emergencia del sector eléctrico.
2. (Juzgar) ¿Estos son suficientes? ¿Es		Otros medios posibles que se pueden incluir son: la	Consideran que estos grupos vulnerables identificados son	

necesario incluir alguno? ¿Eliminar alguno? ¿Agrupar unos con otros?		identificación de fondos disponibles por temática; identificación de proyectos complementarios que puedan ser colaborativos con algunas de las aplicaciones que se están desarrollando; desarrollo de capacidades a través de convenios ya existentes y planes o programas conjuntos de implementación	suficientes; junto con el MIDA y Sinaproc pueden identificar según las edades, cuántos adultos mayores hay. Al ser una comunidad sociedad de bajos recursos, muchos son agricultores por subsistencia, por lo tanto, en cualquier escenario de sequía o inundación son altamente afectados con pérdida de sus enseres e incluso cultivos y animales.	
3. (Priorizar) ¿Cuál es el orden de prioridad y por qué?	Consideró prioritario lo relativo a más disponibilidad de información para el manejo ambiental de las cuencas, lo que brindaría una red de observación más fortalecida en esas cuencas prioritarias y contribuyendo a disminuir el riesgo, alteración o intervención en los ecosistemas o en el paisaje.		Enfatizan la importancia de priorizar la atención a personas con discapacidad porque es la población más vulnerable en todos los aspectos. En segunda instancia priorizar a las mujeres embarazadas y adultos mayores. Con la información que recaban pueden incluso apoyar en reubicaciones de estos grupos más vulnerables, por ejemplo.	
Comentario del equipo consultor y de los participantes	Consideración sobre el tema de vulnerabilidad y amenaza; el proyecto se centra más en la amenaza y riesgo que en la dimensión de vulnerabilidad. De lo que se trata el proyecto es ofrecer mecanismos de resiliencia ante las amenazas que son inevitables. O sea, no podemos evitar que llueva, pero podemos enfrentarlo de una manera congruente y		Considerar la importancia de contar con una línea base para estas segmentaciones, para lo cual se puede utilizar la información reciente del censo de población y vivienda que incluye estas variables.	Este listado que se ha hecho a mano alzada es de mucho valor para la construcción de la nota de concepto, porque va a permitir que la nota se nutra con enlaces a documentos e instrumentos ya existentes, lo que le da muchísima fuerza pues evidencia que el país ha ido avanzando en

	consistente. El IMHPA va a contribuir fortaleciendo el proceso con la alerta temprana, junto con las otras entidades como Sinapro, MIDA, MiAmbiente, etc. - El proyecto específicamente va a mejorar la capacidad de respuesta, tanto a través de la implementación de un sistema de alerta temprana como en términos de planificación. Una mejor planificación me hace más resiliente a poder enfrentar, estoy más preparado y mi capacidad de respuesta se mejora, con lo cual mi vulnerabilidad disminuye. Y la mejora de la capacidad de respuesta en el largo plazo contribuye a la disminución de la vulnerabilidad.			la producción de instrumentos y que el proyecto va a ayudar en la operativización de los mismos.
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El taller culminó con palabras de agradecimiento y complacencia por la calidad y compromiso de todos los participantes por parte del equipo consultor, los representantes de OMM y la Directora del IMHPA. En su calidad de líder del proyecto, la Directora reconoció y reiteró el agradecimiento especial a la OMM, así como a la GWP, CRRH y al equipo consultor por su acompañamiento al proyecto; a la ACP por acoger el proyecto en el magno Centro de Capacitación Ascanio Villalaz; a los representantes institucionales presentes, a la facilitadora y de manera especial al equipo técnico y administrativo del IMHPA que trabajó arduamente para asegurar todos los aspectos de contenido y logísticos del taller.

Se invitó a los participantes a realizar una dinámica interactiva de evaluación de la actividad utilizando para ello una herramienta de calificación en rotafolio con escala de 1-3-5, recibéndose de manera unánime la calificación de 5 (excelencia) del taller en todas sus dimensiones (logística, materiales, agenda y tiempos, exposiciones, facilitación).

5. Memoria fotográfica

A lo largo del taller, el equipo de comunicaciones y tecnología del IMHPA apoyó en la toma de imágenes a fin de documentar la actividad. Las mismas fueron subidas a la carpeta compartida [“Fotos del taller”](#) del Sharepoint donde están disponibles.

A continuación, se presenta una selección de algunas de las imágenes.

Día 1. Exposiciones y plenarias



Día 2. Trabajos en Grupo



Full report referenced in Annex 4 of the Concept Note

INITIAL GENDER ASSESSMENT

Adaptation Fund Regional Project: Enhancing Climate Change Adaptation Capacity in Central America with Focus on Costa Rica and Panama: Enhancement of Hydroclimatic and Early Warning Systems and their Integration for Water Resources Management

Prepared by the World Meteorological Organization (WMO), with support from the Regional Committee on Water Resources of the Central American Integration System (CRRH-SICA) and the Global Water Partnership (GWP)

July 2026

1. Introduction and scope

This initial gender assessment was prepared as an input to the Concept Note of the regional project submitted to the Adaptation Fund. It is a desk-based legal and documentary analysis of the normative frameworks, institutional arrangements and key gender-related data for Costa Rica and Panama; it does not derive from a dedicated stakeholder consultation. Its findings underpin the gender sections of the Concept Note and will be deepened, through gender-responsive consultations with vulnerable groups and women's organizations, during the preparation of the fully developed proposal, in line with the Adaptation Fund Gender Policy. The main text below presents the assessment in English; the full original document, in Spanish, is provided in the annex.

2. Normative and institutional frameworks

2.1 Global and regional instruments

The commitment of Costa Rica and Panama to gender equality derives from the international conferences and conventions ratified by both countries, as well as from the regional consensuses on women in Central America and the Caribbean. Among the most significant instruments are the Fourth World Conference on Women and the Beijing Platform for Action (1995), which gave rise to gender mainstreaming and empowerment as fundamental strategies for the advancement of women's human rights; the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW, 1979); the American Convention on Human Rights (Pact of San José, 1969); and the Inter-American Convention on the Prevention, Punishment and Eradication of Violence Against Women (Belém do Pará, 1994), all ratified by both countries. As members of the Central American Integration System (SICA), both countries are also covered by the Regional Policy on Gender Equality and Equity (PRIEG/SICA).

2.2 National framework in Costa Rica

Costa Rica has a broad legal framework to promote gender equality and sanction discrimination, including the Law to Prevent and Punish Sexual Harassment (Law 8805, 2010); the Law to

Prevent, Address, Punish and Eradicate Violence Against Women in Politics (Law 10235); the National System for the Attention and Prevention of Violence Against Women (PLANOVI 2017-2032); the National Policy on Gender Equality and Equity (PIEG); and the National Policy for Effective Equality between Women and Men. The National Institute for Women (INAMU) is the lead institution on gender, mandated to coordinate policies, programmes and affirmative actions and to ensure comprehensive attention to victims of violence. Public institutions and branches of the State, including the Judiciary and the Legislative Assembly, have adopted institutional gender equality policies. Overall, more than 77 percent of the legal frameworks that promote, enforce and monitor gender equality are in place in the country, with particular focus on violence against women and public participation.

2.3 National framework in Panama

Panama likewise has an extensive body of legislation, including Article 19 of the Constitution, which prohibits discrimination on the basis of sex; Law 4 of 1999, establishing equality of opportunities for women; Law 82 of 2013, which criminalizes femicide and other forms of violence against women; Law 7 of 2018, prohibiting harassment, racism and discrimination in all settings; and Law 56 of 2017, on the participation of women in the boards of State entities. The National Institute for Women (INAMU), created by Law 71 of 2008, was elevated to the Ministry of Women in 2023 as the lead institution for gender equality policies. Complementary mechanisms include the Gender Parity Initiative, promoting public-private alliances to reduce economic gaps, and the Panamanian Observatory against Gender-Based Violence.

3. Key data and trends

Despite these efforts, both countries continue to show significant gaps between women and men. According to the Global Gender Gap Index, Costa Rica has consolidated a position among the leading countries of Latin America, ranking 14th globally in 2023 (score 0.793) and 19th in 2024 (score 0.785), while Panama ranked 58th in 2023 (0.724) and 50th in 2024 (0.742), reflecting mixed progress. The trend for 2020-2024 is summarized below.

Year	Costa Rica: ranking	Costa Rica: index	Panama: ranking	Panama: index
2020	13th	0.782	46th	0.730
2021	15th	0.786	44th	0.737
2022	12th	0.796	40th	0.743
2023	14th	0.793	58th	0.724
2024	19th	0.785	50th	0.742

Table 1. Global Gender Gap Index trend, Costa Rica and Panama (0 = total inequality; 1 = full equality). Source: own elaboration with data from datosmacro.expansion.com.

In Costa Rica, the gender equality profile prepared by the OECD (2024) highlights that women have surpassed men in educational attainment, particularly in secondary and tertiary education, yet remain underrepresented in STEM disciplines. Women's employment rate (47 percent) is 26 percentage points below that of men (73 percent), women are more likely to hold informal and part-time jobs, and they devote approximately 23 more hours per week to unpaid domestic and

care work than men, above the OECD average. Women in rural, indigenous and migrant communities face additional barriers, and gender-based violence remains a significant problem despite the existing legal framework. The OECD recommendations include developing a comprehensive care system, expanding parental leave and co-responsibility, reducing gender stereotypes in education, supporting women's entrepreneurship, and strengthening women's representation in leadership positions.

In Panama, the Country Profile on Gender Equality (UN Women, 2020) shows that, although women constitute about half of the electorate, they remain underrepresented in decision-making positions, including the Judiciary; that women bear a high burden of unpaid work and face a persistent gender pay gap; and that indigenous and Afro-descendant women, as well as girls and adolescents, experience compounded vulnerabilities, with only 17.6 percent of the indigenous population having access to social security as direct insured persons. The COVID-19 pandemic exacerbated these inequalities, increasing women's care burdens and multidimensional poverty, particularly among female heads of household. The profile stresses the need to mainstream the gender approach across all State policies and budgets, in line with the 2030 Agenda.

4. Concluding remarks and implications for the project

Costa Rica has achieved important normative and institutional advances, especially in political representation, education and legal frameworks against discrimination, yet significant gaps persist in formal employment, unpaid work and gender-based violence. Panama has advanced in its legal and institutional frameworks, including the creation of the Ministry of Women, but deep gaps remain in economic participation, political empowerment and gender-based violence, placing the country at an intermediate position regionally.

For the project, these findings confirm that gender differences significantly influence adaptive capacity to climate change, particularly in rural contexts and river basins where women and men have distinct roles in water and natural resource management. They underpin the gender-responsive design of the Concept Note, including the development and implementation of gender action plans, indicators and targeted training (output 4.1.3), and will guide the full gender assessment and gender action plan to be prepared, with participatory methods, during the development of the fully completed proposal, in compliance with the Adaptation Fund Gender Policy and Environmental and Social Policy.

Annex. Extended gender note for Costa Rica and Panama (original Spanish version)

1. Marcos normativos que sustentan la igualdad de género, en Costa Rica y Panamá.

El compromiso de los países centroamericanos en materia de género e inclusión social, emanan de las conferencias y convenciones internacionales ratificadas por los gobiernos que se orientan a promover la igualdad de género, así como de los consensos regionales sobre las mujeres de Centroamérica y del Caribe, los cuales constituyen una hoja de ruta importante para los países de la región y de las instituciones y organizaciones de mujeres en materia de género y derechos humanos.

Durante los últimos años se han logrado avances importantes en los compromisos asumidos de los consensos y convenciones regionales y mundiales, lo que ha contribuido a la construcción de un andamiaje expresado en normativas y políticas sobre la igualdad entre los géneros, como elemento fundamental para la construcción de sociedades más justas e igualitarias, así como la apuesta a la disminución de la violencia contra las mujeres.

Adicional a esto, la cooperación internacional, los fondos de adaptación, medio ambiente y clima, priorizan dentro de sus requerimientos las salvaguardas ambientales y sociales, en las cuales la temática de género es de gran relevancia.

Dentro de los amplios instrumentos de promoción del adelanto de las mujeres, se destacan dos como los más significativos: La IV Conferencia Mundial sobre la Mujer y la Plataforma de Acción de Beijing del año 1995, en los que se reconoce la responsabilidad estatal, del sector privado y de la sociedad civil en el accionar para eliminar todos los obstáculos a la igualdad de oportunidades de las mujeres. Estas conferencias dieron origen al “mainstreaming” y el empoderamiento como estrategias fundamentales para el desarrollo de los derechos humanos de las mujeres.

Existen además otros instrumentos que han sido ratificados por los países de la región del SICA (a los cuales Costa Rica y Panamá pertenecen):

- La Convención sobre la eliminación de todas las formas de discriminación contra la mujer (CEDAW 1979), ratificada por Costa Rica y Panamá.
- Convención Americana sobre Derechos Humanos (Pacto de San José 1969) ratificada por Costa Rica y Panamá,
- La Convención Interamericana para prevenir, sancionar y erradicar la violencia contra las mujeres (Belém do Pará, 1994), ratificada por ambos países.

Los instrumentos señalados se sustentan en los principios de igualdad y no discriminación, y su ratificación por los Estados los convierten en normativas nacionales que consagran los derechos intrínsecos a la igualdad de género, la dignidad humana y la vida libre de violencia para las mujeres.

Adicionales a los instrumentos globales, los países en estudio, son parte del Sistema de la Integración Centroamericana (SICA), en el cual se destaca la Política de Igualdad y Equidad de Género (PRIEG/SICA).

Particularmente los países e instituciones nacionales relacionadas con ambiente, cambio climático y atención a emergencias, cuentan con lineamientos de política y regulatorios, en los cuales se hace evidente la importancia que dichos países otorgan al tema.

Los instrumentos más importantes que sustenta la obligatoriedad de los Estados en materia de género, en este caso para los países de Costa Rica y Panamá, se exponen a continuación.

1.1 Instrumentos legales a nivel mundial y regional que sustentan igualdad de género en Costa Rica y Panamá.

Costa Rica y Panamá, han suscrito acuerdos, convenios y declaraciones internacionales, sobre los derechos de las mujeres, la igualdad entre los géneros y la prevención de la violencia contra las mujeres, que tienen como fundamento el respeto a los derechos humanos en general y de las mujeres en particular. Adicionalmente, las instituciones que trabajan en los temas de cambio climático, gestión de riesgos y ambiente, tienen sus lineamientos propios que apoyan el quehacer de sus oficinas institucionales especializadas.

- a. **Declaración Universal de los Derechos Humanos.** Proclamada en 1948 establece en el Artículo 1 que “Todos los seres humanos nacen libres e iguales en dignidad y derechos, dotados de razón y conciencia y deben comportarse fraternalmente los unos con los otros.” (ONU, 1945)
- b. **Convención sobre la Eliminación de todas las Formas de Discriminación contra la Mujer (CEDAW por sus siglas en inglés).** Esta Convención establece que la discriminación por razón de sexo no sólo supone la negación de oportunidades y resultados desiguales, sino que ante todo constituye una violación de los derechos humanos de la mujer. De esta manera obliga a los Estados a respetar, proteger y garantizar los derechos de las mujeres y señala tres obligaciones para los países que la ratifiquen: i) garantizar que no haya discriminación directa, ni indirecta contra la mujer en las leyes; ii) proteger a la mujer en los espacios públicos y privados; y iii) mejorar su situación adoptando políticas y programas concretos y eficaces (ONU, 1981)
- c. **Declaración y Plataforma de Acción de Beijing (1995).** La Cuarta Conferencia Mundial sobre la Mujer, celebrada en Beijing en 1995, marcó un punto de inflexión para la agenda mundial de igualdad de género. La Declaración y Plataforma de Acción de Beijing, establece el logro de la igualdad de género en 12 esferas cruciales: la mujer y la pobreza, educación y capacitación de la mujer; la mujer y la salud; la violencia contra la mujer; la mujer y los conflictos armados; la mujer y la economía; la mujer en el ejercicio del poder y la adopción de decisiones; mecanismos institucionales para el adelanto de la mujer; los derechos humanos de la mujer; la mujer y los medios de difusión; la mujer y el medio ambiente (ONU, 1995).
- d. **Objetivos de Desarrollo Sostenible (ODS).** Conocidos como Objetivos Mundiales, plantea en el Objetivo 5 la necesidad de lograr la Igualdad de Género, y tiene como meta lograr la igualdad

entre los géneros y empoderar a todas las mujeres y niñas (ONU, 2015). Los objetivos de desarrollo sostenible destacan los vínculos entre igualdad de género, alivio de la pobreza y el desarrollo sostenible, establece que las cuestiones de género juegan un papel fundamental para lograr los otros siete objetivos y garantizar la sostenibilidad del medio ambiente.

- e. **Política Regional de Igualdad y Equidad de Género del Sistema de la Integración Centroamericana (PRIEG/SICA).** Es una política de largo plazo que basa su viabilidad institucional en los pilares de la integración regional, es un instrumento que proporciona la directrices y orientaciones para la intervenciones sectoriales y nacionales en materia de igualdad de género.

1.2 Convenios y Convenciones Internacionales que sustenta la igualdad de género y ambiente.

- a. **Cumbre de la Tierra.** Señala como un elemento importante la necesidad de diseñar programas y proyectos ambientales que incorporen los aspectos de género a fin de mejorar el acceso de las mujeres a los recursos, incrementar su control sobre ellos y mejorar la eficacia en el desarrollo de las intervenciones (ONU, 1992).
- b. **Estrategia de Nairobi.** Reconoce la violencia contra las mujeres en la vida cotidiana de todas las sociedades, y se señala diversas manifestaciones de violencia, resaltando la atención a las mujeres que sufren tratos abusivos en el hogar, las mujeres víctimas de la trata y la prostitución involuntaria, las mujeres privadas de libertad y las mujeres en los conflictos armados. Destaca que uno de los principales obstáculos para el logro de los objetivos del Decenio de las Naciones Unidas para la Mujer: igualdad, desarrollo y paz (ONU, 1986).
- c. **Cumbre Mundial de Desarrollo Social de Copenhague.** Establece que el empoderamiento de las mujeres es condición vital en la resolución de problemas económicos, sociales y ambientales. No se puede lograr un desarrollo social y económico sostenible sin la plena participación de la mujer (ONU, 1995).
- d. **Convenio de las Naciones Unidas sobre la Diversidad Biológica (CDB).** Señala el papel fundamental que tienen las mujeres en la conservación y uso sostenible de la diversidad biológica y la necesidad de su completa participación en la formulación y ejecución de políticas para su conservación en todos los niveles (ONU, 1992)
- e. **Convención Marco de las Naciones Unidas sobre el Cambio Climático (CMNUCC).** A partir de la COP 21 el Acuerdo de París inicia la inclusión de las referencias al equilibrio de género a las acciones con una perspectiva de género y a la igualdad de género, relativas no solo a las actividades sobre el terreno, sino también a entornos institucionales y órganos de toma de decisiones. De esta manera se envía una señal clara para que se perciba la igualdad de género no sólo como un paso sino como componente esencial y necesario para lograr el desarrollo verdaderamente sostenible (ONU, 1992).

- f. **Convención de las Naciones Unidas de Lucha contra la Desertificación.** Destaca el papel desempeñado por la mujer en las regiones afectadas por la desertificación o la sequía, en particular en las zonas rurales de los países en desarrollo y la importancia de garantizar en todos los niveles la plena participación de hombre y mujeres en los programas de lucha contra la desertificación y mitigación de los efectos de la sequía (ONU, 1994).

1.3 Marco Legal y normativo significativo nivel nacional en Costa Rica

Costa Rica cuenta con un amplio marco jurídico para promover la igualdad de género y sancionar la discriminación:

- **Ley para Prevenir y Sancionar el Hostigamiento Sexual (Ley 8805, 2010):** Prohíbe y sanciona el hostigamiento sexual como discriminación por género.
- **Ley para Prevenir, Atender, Sancionar y Erradicar la Violencia contra las Mujeres en la Política (Ley 10235):** Sanciona y previene la violencia política contra mujeres para garantizar el ejercicio de sus derechos políticos.
- **Sistema Nacional para la Atención y Prevención de la Violencia contra las Mujeres (PLANOVI 2017-2032):** Política pública integral para prevenir y abordar la violencia de género.
- **Política Nacional de Igualdad y Equidad de Género (PIEG):** Objetivo cerrar brechas de género en múltiples ámbitos bajo un enfoque de derechos humanos y participación social.
- **Política Nacional para la Igualdad Efectiva entre Mujeres y Hombres:** Formular estrategias encaminadas a la igualdad dentro de todas las instituciones públicas.
- **Instituto Nacional de las Mujeres (INAMU):** Es la institución rectora en género en Costa Rica, encargada de coordinar políticas, programas y acciones que promuevan la igualdad real. Tiene mandato de garantizar acciones afirmativas para cerrar brechas y asegurar atención integral a víctimas de violencia.
- **Políticas Institucionales de Igualdad:** Instituciones públicas y poderes del Estado — incluyendo Poder Judicial y Asamblea Legislativa — han adoptado políticas de igualdad de género para integrar perspectiva de género en su gestión interna y procedimientos judiciales.

En conjunto, más de **77 % de los marcos legales que promueven, aplican y monitorean la igualdad de género** están implementados en el país, con especial enfoque en violencia contra mujeres y participación pública.

1.4 Marco Legal y normativo significativo nivel nacional en Panamá

Panamá tiene un conjunto amplio de leyes que abordan la igualdad de género, la violencia y la no discriminación:

- **Constitución Política de la República de Panamá (Artículo 19):** Prohíbe discriminación por sexo. ([Ministerio de Gobierno de Panamá](#))

- **Ley No. 4 de 29 de enero de 1999:** Instituye la **igualdad de oportunidades para las mujeres**. ([Ministerio de Gobierno de Panamá](#))
- **Ley No. 12 de 20 de abril de 1995:** Aprueba la **Convención Interamericana para prevenir, sancionar y erradicar la violencia contra la mujer (Belem do Pará)**. ([Ministerio de Gobierno de Panamá](#))
- **Ley No. 82 de 24 de octubre de 2013:** Tipifica el **femicidio y otras formas de violencia contra la mujer** y altera el Código Penal para fortalecer sanciones. ([Ministerio de Gobierno de Panamá](#))
- **Ley No. 71 de 23 de diciembre de 2008:** Crea el **Instituto Nacional de la Mujer (INAMU)** como mecanismo de promoción de igualdad. ([Ministerio de Gobierno de Panamá](#))
- **Ley No. 7 de 14 de febrero de 2018:** Prohíbe y sanciona el **acoso, racismo y discriminación**, incluyendo por género, en todos los entornos (trabajo, academia, espacios públicos). ([Littler Mendelson P.C.](#))
- **Ley No. 56 de 11 de julio de 2017:** Establece la **participación de mujeres en juntas directivas estatales**. ([Fiscalía General de Cuentas](#))
- Existen también leyes relacionadas con **licencia de paternidad, protección institucional contra violencia, protección a víctimas y obligaciones de uso de lenguaje con perspectiva de género** en educación. ([Ministerio de la Mujer](#))
- **Instituto Nacional de la Mujer (INAMU) y Ministerio de la Mujer:** El INAMU, ahora elevado a **Ministerio de la Mujer (desde 2023)**, es la institución rectora encargada de elaborar, coordinar y ejecutar políticas, programas y planes para **promover la igualdad de género y empoderar a las mujeres**. ([Gaceta Oficial](#))

Funciona como ente de referencia para acciones intersectoriales e implementación de políticas públicas con enfoque de género en áreas como educación, empleo, salud y protección contra la violencia. ([Gaceta Oficial](#))
- **Iniciativas de Paridad de Género (IPG):** Programa que busca reducir brechas económicas mediante alianzas público-privadas, promoción de liderazgo femenino y políticas de empleo con perspectiva de género. ([Ministerio de Desarrollo Social](#))
- **Observatorio Panameño contra la Violencia de Género:** Espacio interinstitucional para monitorear y visibilizar violencia de género. ([Defensoría del Pueblo de Panamá](#))

2. Avances y Tendencias en la práctica. Datos Clave.

2.1 Índice Global de Brecha de Género.

A pesar de los esfuerzos realizados por reducir las desigualdades de género en Costa Rica y Panamá, ambos países, continúan presentando brechas importantes entre mujeres y hombres en distintos

ámbitos sociales y económicos, los cuales se ven reflejados tanto en los indicadores de género como el Índice Global de Brecha de Género¹.

En los últimos años (2020-2024), **Costa Rica** ha mostrado avances significativos, posicionándose como líder regional en igualdad de género, con puntajes altos (cercanos a 0.79) y rankings destacados (14-16 mundial) en los informes recientes, mientras que **Panamá** ha mostrado resultados mixtos, con una brecha del 73.7% y un ranking alrededor del puesto 44-46 en años como 2020-2021, aunque ambos países muestran tendencias positivas en educación y liderazgo, según el Foro Económico Mundial y datosmacro.com.

Costa Rica (Tendencia General Positiva)

- **2024/2025:** Se ubica entre los primeros puestos de Latinoamérica (2do/3ro) y del mundo (14-16), con un índice alrededor de 0.79, destacando en educación y empoderamiento político, según fuentes de [RRHH Digital](#) y [Centroamérica 360](#).
- **Avances:** Mujeres jóvenes superan a hombres en educación terciaria, un patrón positivo en la región.

Panamá (Resultados Mixtos)

- **2020:** 46º mundial con un índice de 0.7300.
- **2021:** 44º mundial con una brecha del 73.7%, mostrando una leve mejora respecto a años anteriores.
- **Retrocesos:** En años recientes (como 2025), se reportaron retrocesos en Centroamérica, incluyendo a Panamá, en contraste con los avances de Costa Rica y El Salvador.

Año	Ranking	Índice de brecha (0= desigualdad total → 1 = igualdad total) Costa Rica	Índice de brecha (0= desigualdad total → 1 = igualdad total) Panamá	Ranking
2020	13°	0.7820	0.7300	46°
2021	15°	0.7860	0.7370	44°
2022	12°	0.7960	0.7430	40°
2023	14°	0.7930	0.7240	58°
2024	19°	0.7850	0.7420	50°

Tabla 1. Comparativo de tendencia del Índice de Brecha Global de Género, Costa Rica y Panamá

Fuente: elaboración propia con datos de <https://datosmacro.expansion.com/paises>

2.2 Perfil de igualdad de género en Costa Rica (OCDE, 2024), Organización para la Cooperación y el Desarrollo Económico (Este puede ser un anexo)

¹ El índice de la brecha de género analiza la división de los recursos y las oportunidades entre hombres y mujeres en 153 países. Mide el tamaño de la brecha de dicha desigualdad de género en la participación en la economía y el mundo laboral cualificado, en política, acceso a la educación y esperanza de vida (Expansion.com/ Datosmacro.com, 2020). El indicador utilizado universalmente para medir esta brecha es la diferencia entre el salario promedio de los hombres y de las mujeres (en términos del salario masculino).

En las últimas décadas, la igualdad de género en Costa Rica ha avanzado en múltiples dimensiones. Sin embargo, al igual que en otros lugares de la región y el mundo, hombres y mujeres no comparten por igual el trabajo remunerado y no remunerado, lo que tiene consecuencias negativas para los principales resultados económicos de las mujeres. Este informe revisa los datos sobre las diferencias en educación y empleo entre hombres y mujeres, tanto en Costa Rica como en comparación internacional. Analiza los factores que impulsan estas diferencias de género, destaca las variaciones entre grupos socioeconómicos y propone un marco político estratégico hacia una economía y una sociedad más igualitarias, sostenibles y productivas.

Resumen de los principales hallazgos para Costa Rica:

1. Educación:

- Las mujeres han superado a los hombres en logros educativos, especialmente en educación secundaria y terciaria.
- A pesar de los avances, los niveles educativos generales están por debajo del promedio de la OCDE.
- Las mujeres están subrepresentadas en disciplinas STEM (Ciencia, Tecnología, Ingeniería y Matemáticas).

2. Empleo:

- La tasa de empleo de las mujeres (47%) es significativamente menor que la de los hombres (73%), con una brecha de 26 puntos porcentuales.
- Las mujeres tienen más probabilidades de trabajar en empleos informales y de baja calidad, y muchas trabajan a tiempo parcial.
- Las madres enfrentan mayores desventajas en el mercado laboral, con una alta proporción de empleo informal y salarios más bajos.

3. Trabajo no remunerado:

- Las mujeres dedican 23 horas más a la semana al trabajo doméstico y de cuidados no remunerado que los hombres, lo que supera el promedio de la OCDE.
- La carga de trabajo no remunerado afecta negativamente la participación de las mujeres en el mercado laboral.

4. Desigualdades socioeconómicas:

- Las mujeres en zonas rurales, indígenas y migrantes enfrentan mayores barreras para acceder a empleo y educación.
- Las mujeres indígenas tienen tasas de empleo significativamente más bajas y enfrentan múltiples formas de desventaja.

5. Violencia de género:

- La violencia de género sigue siendo un problema significativo, con altas tasas de violencia doméstica y acoso sexual en espacios públicos y laborales.
- Aunque existen leyes y políticas para combatir la violencia de género, persisten barreras para el acceso efectivo a la justicia.

6. Políticas públicas y recomendaciones:

- Se necesita un sistema integral de cuidado para niños y adultos mayores, con mayor cobertura y calidad.
- Ampliar la licencia parental y fomentar la corresponsabilidad en el cuidado entre hombres y mujeres.
- Reducir los estereotipos de género en el sistema educativo y promover la participación de las niñas en disciplinas STEM.
- Apoyar el emprendimiento femenino, especialmente en zonas rurales, y simplificar los procedimientos administrativos para registrar empresas.
- Implementar medidas para garantizar la seguridad de las mujeres en el transporte público y en el lugar de trabajo.
- Fortalecer la representación de las mujeres en puestos de liderazgo en el sector público y privado.

7. Impacto de las políticas:

- Las políticas de igualdad de género pueden contribuir significativamente al crecimiento económico y al bienestar social, especialmente en un contexto de envejecimiento poblacional y disminución de la fuerza laboral en Costa Rica.

2.3 Perfil de país según igualdad de género en Panamá (PPIG) ONU Mujeres, 2020. (Puede ser anexo).

El PPIG analiza la igualdad de género en Panamá, abordando diversas dimensiones como la política, economía, educación, salud y medio ambiente.

Dimensiones del Informe sobre Igualdad de Género

- El PPIG se estructura en cuatro dimensiones: social, económica, política y ambiental.
- Se analizan brechas de género en diversas áreas, incluyendo participación política y condiciones laborales de las mujeres.

Desafíos y Brechas de Género

- La participación política de mujeres en Panamá ha mostrado un aumento mínimo en candidaturas.

- Las mujeres enfrentan una alta carga de trabajo no remunerado y una brecha salarial de género persistente.

Dimensiones de la Igualdad de Género en Panamá

- Se analizan los derechos a la salud y educación de las mujeres, así como las violencias que enfrentan a lo largo de su vida.
- Se identifican vulneraciones de derechos en jóvenes, niños, niñas, adolescentes, y poblaciones indígenas y afrodescendientes.
- La cooperación internacional ha contribuido a políticas públicas para reducir desigualdades de género.

Desigualdades de Género en el Sistema Social

- Las relaciones de poder entre hombres y mujeres son consideradas naturales, perpetuando la desigualdad.
- El sistema sexo-género asigna roles estereotipados y privilegios al género masculino, relegando a las mujeres al ámbito privado.
- La política de igualdad de oportunidades desde 1999 no ha logrado cerrar las brechas de género.

Transversalización de Género en Políticas Públicas

- Se requiere incluir el enfoque de género en todas las políticas estatales y presupuestos.
- La Agenda 2030 promueve la igualdad de género como esencial para el desarrollo sostenible.
- La capacitación en género es fundamental para transformar roles y relaciones en la sociedad.

Impacto del COVID-19 en las Mujeres

- La pandemia ha exacerbado desigualdades, afectando la salud y la economía de las mujeres.
- Las mujeres asumen roles de cuidado y trabajo en sectores esenciales, aumentando su carga laboral.
- La crisis ha incrementado la pobreza multidimensional, afectando especialmente a mujeres jefas de familia.

Participación Política de las Mujeres en Panamá

- La participación política de las mujeres ha enfrentado obstáculos culturales y patriarcales.
- En 2014, el 50.1% de los votantes eran mujeres, y en 2019, el 49.18% del padrón electoral.

- A pesar de la alta participación como votantes, las mujeres siguen subrepresentadas en puestos de poder.

Desigualdad en el Poder Judicial

- La Corte Suprema de Justicia ha tenido solo tres presidentas en su historia.
- Desde 2010 a 2019, solo una mujer ocupó un cargo de magistrada en cuatro años.
- En 2020, el 33.3% de los magistrados eran mujeres, el mayor número registrado.

Dificultades para la Participación Política

- Las mujeres enfrentan compromisos reproductivos y dependencia económica que limitan su participación.
- La falta de capacitación política y la violencia política son obstáculos significativos.

Acciones para Promover la Participación Femenina

- Se proponen capacitaciones políticas con enfoque de género y la organización de mujeres a nivel local.
- Es esencial promover la concientización sobre la importancia de la participación política de las mujeres.

Exclusión y Población Indígena

- La población indígena en Panamá es de 271,624, con 137,695 mujeres.
- Solo el 17.6% tiene acceso a la seguridad social como asegurados.
- Las mujeres dependientes en calidad de esposas son solo el 4.1% de la población femenina indígena.

Participación de Mujeres en el Mercado Laboral

- La tasa de participación de mujeres jóvenes (15-24 años) ha fluctuado entre 48.9% y 52.8% de 2012 a 2017.
- Las mujeres tienen menor representación en el mercado laboral formal en comparación con los hombres.

Educación y Género

- La tasa de analfabetismo en mujeres es del 4.4%, superior al 3.54% en hombres.
- La matrícula escolar muestra que las niñas están rezagadas en preescolar, pero superan a los niños en secundaria.

Salud y Mortalidad Materna

- La esperanza de vida de las mujeres es de 83.42 años, mientras que la de los hombres es de 77.6 años.
- La mortalidad materna ha disminuido ligeramente, pero sigue siendo alta en áreas indígenas como Ngäbe Buglé.

Definiciones y Contexto de la Violencia de Género

- La Ley Nº 38 define varios términos relacionados con la violencia, incluyendo agresor, víctima y violencia doméstica.
- En América Latina, dos de cada tres femicidios ocurren en el contexto de pareja, con cifras alarmantes en países como República Dominicana y Uruguay.

Femicidios en Panamá

- Hasta abril de 2020, se registraron 14 femicidios, un aumento del 75% en comparación con el mismo periodo de 2019.
- La mayoría de las víctimas tenía entre 18 y 49 años, y el uso de armas blancas fue predominante en los casos.

Violencia Doméstica y Denuncias

- Entre 2013 y 2018, se registraron más de 105,000 denuncias de violencia doméstica, con un 76% de las víctimas siendo mujeres.
- En 2019, se denunciaron 16,851 casos, un aumento respecto al año anterior.

Tipos de Violencia y Estadísticas

- La violencia física afecta al 6.7% de las mujeres de 15 a 49 años, mientras que el 5.3% reportó violencia sexual.
- La violencia psicológica es difícil de identificar y a menudo no se denuncia, contribuyendo al subregistro de casos.

Pobreza y Delincuencia en Panamá

- La pobreza y la falta de oportunidades educativas y laborales contribuyen a la violencia y delincuencia.
- En 2019, el 85% de las mujeres privadas de libertad tenía entre 20 y 44 años.

Población Privada de Libertad

- En 2020, las mujeres representaron el 5% de la población penal.
- El 49% de las mujeres privadas de libertad están separadas o divorciadas.

Educación y Superación Académica

- Solo el 11% de las personas privadas de libertad asistía a un centro educativo en 2018.

- Las mujeres superan a los hombres en asistencia a niveles académicos, con un 43.8% frente a 17.5%.

Violencia y Hacinamiento en Prisiones

- El 21% de las mujeres reportaron haber sufrido violencia o agresión en prisión.
- El hacinamiento en centros penitenciarios alcanza hasta un 393% en algunos casos.

Inaccessibilidad y Discriminación hacia Personas con Discapacidad

- Se destaca la falta de albergues accesibles para mujeres víctimas de violencia.
- La ausencia de datos sobre niños con discapacidad y la discriminación que enfrentan, especialmente indígenas y afrodescendientes.
- No se prohíben los castigos corporales en diversos entornos.
- Se observan barreras para el acceso a la justicia y la institucionalización de personas con discapacidad.

Género y Cambio Climático

- La igualdad de género es esencial para el desarrollo sostenible.
- Las mujeres son las principales responsables del manejo de recursos hídricos en comunidades rurales.
- La legislación ambiental debe incluir la perspectiva de género para abordar desigualdades.

Acceso al Agua y Saneamiento

- El acceso a agua potable es del 93.5% a nivel nacional, pero con desigualdades en áreas rurales.
- Las comarcas indígenas tienen los mayores porcentajes de viviendas sin acceso a agua potable.
- Las mujeres son las principales encargadas de la recolección de agua en el hogar.

Plan de Acción contra la Violencia de Género

- Se ejecuta con consenso social y recursos asignados.
- Implementación de la Ley No 82 conforme a reglamentación del CONVIMU.
- Estrategia de recolección y difusión de datos sobre violencia de género.

Protocolo de Atención Intercultural

- Creación de un protocolo que integra cosmovisiones indígenas.
- Prevención de violencia sexual y femicidio.
- Enfoque intercultural en la atención a mujeres y niñas.

Capacitación en Género para Instituciones

- Programas de formación en género para personal de servicios esenciales.
- Mejora en la atención a la violencia con participación de organizaciones de mujeres y LGBTIQ+.
- Fortalecimiento de capacidades en la prevención de violencia.

Acceso a la Justicia y Tecnología

- Condiciones adecuadas para el acceso a la justicia.
- Desarrollo de procesos resilientes y uso de herramientas tecnológicas.
- Prevención de ciberbullying y ciberataques.

3. Conclusiones Principales.

Costa Rica

- Costa Rica ha logrado **avances normativos e institucionales importantes**, especialmente en representación política, educación y marcos legales contra la discriminación. Sin embargo:
- Persisten brechas significativas en **empleo formal, trabajo no remunerado y violencia de género**.
- El **índice global de brecha** indica estabilidad, pero sin aceleración de cierres de brechas en la última fase (2022-2024).
- Requieren priorizarse políticas que integren cuidados, empleo inclusivo, prevención social de violencia y programas dirigidos a poblaciones vulnerables.

Panamá

- Panamá ha avanzado en marcos legales e institucionales, incluyendo la creación del Ministerio de la Mujer y políticas enfocadas en igualdad y prevención de violencia. (Gaceta Oficial)
- La evolución del Índice Global de Brecha de Género muestra progreso general en la última década, aunque con fluctuaciones recientes. (countryeconomy.com)
- Persisten brechas profundas en participación económica, empoderamiento político y violencia de género, que requieren reforzar políticas basadas en evidencia. (Statista)
- En comparación regional, Panamá está en un punto medio, con retos similares a otros países centroamericanos, pero con potencial para acelerar la reducción de brechas. (countryeconomy.com)