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Independent Evaluation of the GCF's Approach to and Portfolio of Climate Information and Early Warning System Interventions

Approach paper

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APPROACH PAPER

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ABBREVIATIONS

ADB	Asian Development Bank
AE	Accredited entity
AI	Artificial intelligence
APR	Annual performance report
B.40	Fortieth meeting of the Board
CCA	Climate change adaptation
CIEWS	Climate information and early warning systems
CIF	Climate Investment Funds
CIS	Climate information services
CMA5	The fifth session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CN	Concept note
COP	Conference of the Parties
CREWS	Climate Risk and Early Warning Systems
CRM	Climate risk management
DAE	Direct access entity
DRM	Disaster risk management
EW4All	Early Warnings for All
EWS	Early warning systems
FGD	Focus group discussions
FP	Funding proposal
FRLD	Fund for Responding to Loss and Damage
GCF	Green Climate Fund
GEF	Global Environment Facility
GFCS	Global Framework for Climate Services
GI	Governing Instrument
IAE	International accredited entity
IBFWs	Impact-based forecasts and warnings
IEU	Independent Evaluation Unit
IFRC	International Federation of Red Cross and Red Crescent Societies
IRMF	Integrated Results Management Framework
KII	Key informant interview
LDC	Least developed country

LORTA	Learning-Oriented Real-Time Impact Assessment
MHEWS	Multi-hazard early warning systems
NAP	National adaptation plan
NDC	Nationally determined contribution
NDMA	National disaster management authority
NFCS	National Framework for Climate Services
NGO	Non-governmental organization
NMHS	National Meteorological and Hydrological Services
OECD DAC	Organisation for Economic Co-operation and Development's Development Assistance Committee
PAP	Proposal approval process
PMF	Mitigation and Adaptation Performance Measurement Framework
PPF	Project Preparation Facility
RMF	Initial Results Management Framework
RPSP	Readiness and Preparatory Support Programme
SAP	Simplified approval process
SIDS	Small island developing State
SOFF	Systematic Observations Financing Facility
ToR	Terms of reference
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USP-2	Strategic Plan for the Green Climate Fund 2024–2027
WB-GFDRR	World Bank Global Facility for Disaster Reduction and Recovery
WIM ExCom	Warsaw International Mechanism for Loss and Damage Executive Committee
WMO	World Meteorological Organization

A. Introduction

1. Background

The Green Climate Fund (GCF) is a multilateral fund established in 2010 whose purpose is to support global efforts to mitigate and adapt to climate change by contributing to the goals of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. The GCF promotes a paradigm shift towards low-emission climate resilience in the context of sustainable development. The Fund provides support to developing countries to reduce their greenhouse gas emissions and to adapt to climate change, while acknowledging the needs of low- and middle-income countries particularly vulnerable to the adverse effects of climate change.

The GCF is governed by a Board composed of 24 members, with an equal number of members from developing and developed country Parties, while also ensuring representation from United Nations regional groupings and representatives from small island developing States (SIDS) and least developed countries (LDCs). The work of the GCF is carried out by a Secretariat comprised of more than 300 personnel operating at the Fund's headquarters in Songdo, Republic of South Korea. The Secretariat is composed of eight offices that oversee 16 departments, with each office reporting to the Office of the Executive Director. Separate from the Secretariat structure and reporting directly to the GCF Board, there are three independent units of the GCF, including the Independent Evaluation Unit (IEU), Independent Integrity Unit and Independent Redress Mechanism.

In accordance with the GCF Governing Instrument (GI) paragraphs 59–62, the IEU conducts independent evaluations of the GCF's activities to guarantee its accountability and synthesizes learnings from high-quality and rigorous evaluations to support GCF's effectiveness and efficiency. This dual accountability-learning function is further laid out in the GI and the updated terms of reference (ToR) of the IEU.[1] The frequency and types of evaluations are specified by the IEU in agreement with the GCF Board and are intended to inform decision-making by the Board. IEU reports are also published and provided to the Conference of the Parties (COP) to enable periodic reviews of the financial mechanism of the UNFCCC.

At the fortieth meeting of the Board (B.40) held in Songdo, Republic of South Korea, during 21–24 October 2024, the Board approved the IEU workplan, budget and updated rolling objectives which included an evaluation of the GCF's approach to and portfolio of climate information and early warning systems (CIEWS) interventions.[2] The IEU is mandated to submit the evaluation report by the first Board meeting of 2026. This document presents the purpose and objectives of the evaluation, global and GCF landscapes, the evaluation's analytical approach including key evaluation questions, planned methodologies and the implementation plan.

2. Purpose and objectives

a. Climate change-related risks: the rationale for climate information services and early warning systems

Increases in extreme weather events associated with climate change cause loss of life and severe socioeconomic impacts, particularly for the most vulnerable populations around the globe who are

[1] See Green Climate Fund (2021a), annex I.
[2] See Green Climate Fund (2024b), annex VI.

disproportionately affected. According to the World Meteorological Organization (WMO, 2021), weather and climate-related disasters have increased fivefold over the past 50 years. Hydro-meteorological hazards, such as floods, storms, cyclones, drought, wildfire and heatwaves are key drivers of disaster impacts, resulting in 56 per cent of deaths and 75 per cent of economic losses (1970–2019) (World Meteorological Organization, 2020). While storms caused the largest economic losses between 2020–2024, heat-related hazards were the leading cause of death during the same period, making up 57 per cent of the total reported weather and climate-related deaths globally (World Meteorological Organization, 2024). Complex events with multiple hazards are prevalent and produce an outsized proportion of mortality and economic losses (United Nations Office for Disaster Risk Reduction and World Meteorological Organization, 2024).

Moreover, long-term changes and shifts in climate trends have the potential to exacerbate existing risks, while also creating new exposures and vulnerabilities that can undermine previously achieved gains and future progress towards sustainable development (Intergovernmental Panel on Climate Change, 2023a). For example, rising global temperatures have produced more variable precipitation patterns – with increases in heavy rainfall events in some regions and prolonged drought in others – posing challenges to agricultural production and infrastructure planning (Intergovernmental Panel on Climate Change, 2021). As another example, declines in glaciers and snow cover can affect the availability of fresh water, while also increasing the risk of rapid onset flooding through glacial lake outburst floods (Intergovernmental Panel on Climate Change, 2019). According to the Intergovernmental Panel on Climate Change (2023b), the probability of compound events, such as concurrent heatwaves and droughts, is rising and expected to continue in coming decades. Considering changing climate-related hazards and risks associated with climate change, there is a need to identify, implement and bolster robust approaches for integrated climate and disaster risk management, including climate adaptation and mitigation to minimize associated losses and damages (Intergovernmental Panel on Climate Change, 2022).

While disaster risk management (DRM), climate risk management (CRM) and climate change adaptation (CCA) share common elements, including an emphasis on risk assessment and analysis, preparedness and planning, and resilience building, they have historically focused on different timescales, strategies and tools. DRM enables the implementation of policies and strategies to prevent new, reduce existing, and manage residual disaster risk, thereby contributing to resilience and sustainable development.[3] While DRM has historically focused on rapid onset hazards, the focus is currently all-inclusive, encompassing slow onset events such as drought. In contrast to CRM and CCA, DRM goes beyond climate-related hazards and shocks (United Nations Office for Disaster Risk Reduction, n.d-b). CRM focuses on systematic incorporation of climate information into warnings, planning, decision-making, and investment – ranging from short-term extreme events to long-term and slow onset processes – to reduce negative impacts of climate variability and change, along with related shocks and stresses (United Nations Framework Convention on Climate Change, n.d-a; Organisation for Economic Co-operation and Development, 2009). Disaster risk finance and CRM both employ financial tools and mechanisms, such as climate risk insurance, weather derivatives, reinsurance and catastrophe bonds, to protect against potential disaster and climate-related losses. More generally, climate adaptation refers to long-term adjustments in systems, policies and practices to reduce vulnerability to climate impacts and capitalize on emerging opportunities. Adaptation can encompass both DRM and CRM (United Nations Framework Convention on Climate Change, n.d-c.). Despite the nuances and slightly different approaches,

[3] DRM most commonly comprises four strands: prevention, preparedness (including anticipation), response and recovery.

climate information services (CIS) and early warning systems (EWS) are foundational across DRM, CRM and CCA, and integration across these domains is increasingly common in practice with the potential to create significant and tangible benefits.

The IPCC recognizes that EWS, CIS and DRM activities are key cross-cutting adaptation options, that can enhance the benefits of other climate response measures to reduce the exposure and vulnerability of more than 5 billion people globally (Intergovernmental Panel on Climate Change, 2022). EWS is a highly cost-effective climate adaptation measure that can provide up to a tenfold return on investment (World Meteorological Organization, 2024). Multi-hazard early warning systems (MHEWS) that address "several hazards of similar or different nature in contexts where events may occur alone, simultaneously, in cascades or cumulatively over time" are a critical component of improving disaster outcomes (United Nations Economic and Social Commission for Asia and the Pacific, 2023).[4] The most recent report *2024 Global Status of Multi-Hazard Early Warning Systems* shows that between 2005–2023, countries with limited MHEWS capacity experienced mortality rates six times higher than in countries with comprehensive systems in place (United Nations Office for Disaster Risk Reduction and World Meteorological Organization, 2024). It is widely accepted that a good EWS is a MHEWS because of the savings offered by a consistent and holistic approach.

Over the past several decades, increasing need coupled with rapid improvements in weather forecasting, climate and prediction capacities have propelled inclusion of climate information within EWS and medium- and long-term decision-making across multiple sectors, such as agriculture, food security, health, energy, water security, transport and infrastructure. According to the WMO, improved weather and climate services have the potential to enhance global agricultural productivity by USD 30 billion, while reducing losses by USD 2 billion per year (World Meteorological Organization, 2019). Additionally, the use of climate information within infrastructure investments can improve reliability, reduce maintenance and extend asset lifetimes – with up to a 4-to-1 return on every dollar invested in climate-resilient infrastructure (Organisation for Economic Co-operation and Development, 2024).

b. Purpose and objectives of the evaluation

With its mandate to support developing countries in addressing climate change mitigation and adaptation issues, the GCF has made significant investments in CIS and EWS interventions over the past decade. As of May 2025, the GCF Secretariat identified 89 projects/programmes amounting to USD 1.3 billion, encompassing both single and multiple-country initiatives across 91 countries, including 29 SIDS, 33 LDCs and 38 African States.[5] These projects, collectively referred to as CIEWS projects/programmes by the GCF, largely consist of traditional hydromet modernization, CIS, and EWS projects; and projects with sector applications and use of CIEWS in resilience building (Green Climate Fund, 2024a).

Despite the significant investments in CIEWS to date and the accumulating knowledge in this sector, there has not been any evaluation or assessment of GCF's support to or portfolio of CIEWS projects/programmes. Key questions arise: **How can the GCF be more fit-for-purpose in**

[4] MHEWS covers weather and climate hazards events that fall under the CIEWS umbrella; however, MHEWS also targets non-climate hazards that are geological, environmental, biological, chemical and technological.
[5] The funding amounts directed to CIEWS were estimated by taking the sector-based percentage breakdowns available in the GCF's system known as the Integrated Portfolio Management System for each project/programme, and multiplying these by the GCF funding amounts for corresponding projects/programmes. Note projects/programmes without the sector-based percentage breakdown information but which looked like they were CIEWS-related were assigned an approximate percentage for the purpose of estimation.

promoting and supporting CIEWS in developing countries with a view to strengthening resilience, particularly given the increasing probability of both rapid and slow onset events? How can the GCF as the global climate finance mechanism build stronger coalitions with other international actors to identify and collectively fill investment gaps in the CIEWS value chain, and/or bring in and blend private sector resources to effect paradigm shifts faster than ever before? These questions can only be answered by taking stock of GCF's work in the sector over the past decade, reflecting and extracting lessons for the future. This is why the evaluation is crucial and must be utilization-focused.

Accordingly, the IEU will undertake this strategic evaluation by focusing on two important areas of research. Firstly, IEU will evaluate GCF's approach to CIEWS, particularly how the GCF has collaborated with other CIEWS actors and or leveraged its programmatic approaches and funding windows, such as the Readiness and Preparatory Support Programme (RPSP) and Project Preparation Facility (PPF) in supporting and promoting CIEWS.

Secondly, the evaluation will assess the GCF's portfolio of CIEWS projects/programmes, including how the GCF portfolio of projects/programmes has been effective in making CIEWS available, accessible and responsive with a view to protecting lives and livelihoods and strengthening resilience in these countries. These research areas are further elaborated under section E.

Under each of the research areas, this evaluation has the following objectives:

Table 1. Evaluation objectives

No.	Research area	Objectives
1	Approach	To assess the synergies and alignment of GCF support in the CIEWS sector with other CIEWS actors and stakeholders globally, regionally and/or in target countries with an ultimate objective of identifying the remaining gaps in CIEWS.
2	Approach	To assess as to what extent GCF is leveraging its programmatic approaches and funding windows such as RPSP; PPF and funded activities including standard proposal approval process (PAP) and simplified approval process (SAP) for supporting CIEWS interventions.
3	Portfolio	To assess the extent to which the GCF portfolio of CIEWS projects/programmes have been effective in making CIEWS available, accessible and responsive.
4	Portfolio	To assess the evidence of (both realized and potential) CIEWS impacts, sustainability, scalability and replicability.

c. Road map for this approach paper

To address these research areas, the evaluation will organize its work around four phases: (i) inception, (ii) data-collection and analysis, (iii) drafting, and (iv) final reporting and communication/dissemination. This approach paper highlights the results from the inception phase, where scoping and desk review were undertaken. It provides the foundation for the evaluation by establishing its approach, framework and methodology.

Having covered the rationale and objective of the evaluation in section A, section B provides readers with a synopsis of the global policy landscape, global progress to date, existing gaps as well as key barriers and challenges to CIS and EWS progress. Section C lays out the GCF CIEWS context including the evolution of CIEWS within the Fund as well as GCF documents and data linked to

CIEWS. Section D presents the definition of CIEWS and the theory of change (ToC) developed for this evaluation. Section E then presents the evaluation framework and methodology. It also proposes the list of five countries that the evaluation team will aim to visit to deepen the evidence for the evaluation. Finally, section F describes the evaluation workplan.

B. CLIMATE INFORMATION SERVICES AND EARLY WARNING SYSTEMS

The following section provides the preliminary review of global-level policies and frameworks related to CIEWS. As the evaluation process continues, the discussion presented here will be refined and adjusted by triangulating information gathered from additional literature reviews, key informant interviews (KIIs), data analyses and country visits. Global context

An increasing number of policy and framework initiatives have supported the development, implementation and expansion of CIS and EWS over the past decades. While the development of CIS and EWS occurred in a relatively separate manner before 2015, the post-2015 period has seen increasing opportunities for the international community to enhance coherence and coordination across these policies and frameworks.

a. Climate services and disaster risk reduction

The need for enhanced and coordinated climate services was formally recognized at the third World Climate Conference in 2009, resulting in the establishment of the Global Framework for Climate Services (GFCS) in 2012. The GFCS is a United Nations-led initiative spearheaded by WMO with a vision to enable society to better manage the risks and opportunities arising from climate variability and change (World Meteorological Organization, 2016). The GFCS supports the Paris Agreement through its objective to ensure the availability of science-based research and systematic observations for decision-making (World Meteorological Organization, n.d.). The GFCS scope includes five priority sectors, namely agriculture and food security, disaster risk reduction (DRR), energy, health, and water. The National Framework for Climate Services (NFCS) provides country-level implementations of the GFCS, focusing on developing and delivering climate services tailored to national needs and circumstances. The WMO tracks the implementation of NFCS through step 0 to 6, with 0 being a planned phase and 6 being where countries with NFCS provide advanced services (World Meteorological Organization, 2025). For example, the NFCS supports national adaptation plans (NAPs) through the provision of climate services, which in turn help with the identification of adaptation options and or enhancement of adaptation planning across the priority sectors. Indeed, climate services are becoming increasingly integrated into national adaptation planning and actions. Of the 58 countries that have submitted NAPs (as of July 2024), 48 (83 per cent) recognized the importance of climate services as part of their national adaptation strategies (World Meteorological Organization, 2024). In particular, the National Meteorological and Hydrological Services (NMHS) under the NFCS play important roles in the provision of climate services and coordination and engagements in countries, including through the five GFCS priority sectors.

The GFCS is comprised of six components of the climate services value chain, including: (i) basic systems and observations, to ensure the continuous and reliable collection of climate data as may be crucial for climate monitoring and prediction; (ii) research, modelling and prediction, which enables climate services to be based on the latest scientific data, information and knowledge; (iii) a climate services information system through which climate data and information are collected, processed and disseminated; (iv) user engagement, also known as user interface platforms, to facilitate

exchanges between climate service providers and users thereby ensuring that the services are tailored to the needs of various sectors for greater benefits; (v) capacity development such as training and education programmes to strengthen the understanding and use of climate information; and (vi) governance for effective coordination with NMHS playing the key coordination role (World Meteorological Organization, 2024).

The vision of GFCS supports the Sendai Framework for Disaster Risk Reduction adopted in 2015 succeeding the Hyogo Framework for Action 2005−2015. The GFCS emphasizes hazard analysis through the use of historical and real-time hazard data and meteorological, hydrological and climatological forecasts and trend analysis while the Sendai Framework carries an overarching goal to "prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience" (World Meteorological Organization, 2016; United Nations Office for Disaster Risk Reduction, 2015).

The adoption of the Sendai Framework marked the culmination of DRR process that formally began in the 1970s. Starting from the International Expert Group Meeting in 1979 to review work developing a methodology for risk analysis, the process followed the development of the International Framework of Action for the International Decade for Natural Disaster Reduction in 1980s with the adoption of the International Framework of Action for the International Decade for Natural Disaster Reduction in 1994 as the Yokohama Strategy. The Yokohama Strategy placed, for the first time, great importance on socioeconomic vulnerability in disaster risk analysis, emphasizing the role of human actions in reducing vulnerability to natural hazards and disasters (United Nations Office for Disaster Risk Reduction, n.d-a). Subsequently, the Hyogo Framework emphasized involving people in all aspects of DRR while maintaining the objective of reducing disaster losses as its core focus. Finally, the Sendai Framework concluded the process by shifting its focus to reducing disaster risk while simultaneously establishing a clear implementation framework with global targets. For example, the framework includes the availability and accessibility of MHEWS as one of the seven global targets, along with six concrete global-level indicators to track progress against the target. The Sendai Framework also marked major progress in coherence efforts with other policies and frameworks by clearly recognizing climate change as one of the drivers of disaster risk, and articulating the opportunity to reduce disaster risk in a coherent manner throughout the interrelated intergovernmental processes, including the UNFCCC.

Interconnected to the Sendai Framework is the Early Warnings for All (EW4All) initiative which was launched by United Nations Secretary-General António Guterres in 2022. Both the Sendai Framework and EW4All share focus on reducing disaster risk and strengthening people-centric EWS. As noted above, the Sendai Framework includes MHEWS as a crucial tool for DRR while the EW4All aims to achieve universal access to MHEWS by 2027.

To achieve universal access by 2027, the EW4All Executive Action Plan (2023–2027) highlights the need for the targeted investment of an estimated USD 3.1 billion into the four pillars of EWS. These pillars are disaster risk knowledge (USD 374 million), detection observations, monitoring, analysis and forecasting of hazards (USD 1.18 billion), warning dissemination and communication (USD 550 million), and preparedness and response capabilities (USD 1 billion) (United Nations General Assembly, 2022). These pillars are led by the United Nations Office for Disaster Risk Reduction (UNDRR), WMO, International Telecommunication Union, and International Federation of Red Cross and Red Crescent Societies (IFRC), respectively. Importantly, the plan emphasizes the need to

address these pillars from scientific and technical, policy, and financial perspectives and clarifies that national-level implementation should involve both NMHS and national disaster management authorities (NDMA) in countries.

The EW4All initiative leverages existing pooled funding mechanisms such as the Systematic Observations Financing Facility (SOFF), the Climate Risk and Early Warning Systems (CREWS) initiative as well as the global multilateral funds including the GCF as its funding sources. The SOFF is a new specialized United Nations climate fund, established in 2022 by the WMO, the United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP) in response to the request of the 193 countries and territories of the World Meteorological Congress in 2021. It is a delivery vehicle for pillar 2 of the EW4All (Systematic Observations Financing Facility, 2023b). With priorities of assisting LDCs and SIDS and recognizing the public good value of basic weather and climate data, the SOFF only provides grant funding to target countries (Systematic Observations Financing Facility, 2023b). As of May 2025, SOFF has supported 61 countries with readiness amounting to USD 9 million, and 15 countries with fully funded proposals totalling USD 91 million, which is 7 per cent of the estimated GCF investments in CIS and/or EWS (Systematic Observations Financing Facility, 2025). At COP28, the SOFF signed the framework for enhancing systematic observation and improving the use of basic weather and climate data for effective climate action with multilateral climate funds, including the GCF, representing an effort for coherence and complementarity among these global actors (Systematic Observations Financing Facility, 2023a).

The signed Parties to the above framework included the CREWS. The CREWS initiative – another funding mechanism focused on CIS and EWS – was launched at COP21 where the Paris Agreement was adopted. The overall objective of the CREWS initiative is to support LDCs and SIDS to significantly increase the provision of weather and climate services and improve capacity to generate and communicate effective impact-based, multi-hazard, gender-informed EWS to protect lives, livelihoods and assets (Climate Risk and Early Warning Systems, 2019). The initiative was originally proposed by the Government of France in 2015 at the Third United Nations World Conference on DRR in Sendai, Japan, where the international community adopted the Sendai Framework. Indeed, the CREWS contributes directly to the Sendai Framework through multiple targets including target G on MHEWS, and supports article 7 of the Paris Agreement on the Global Goal on Adaptation (Climate Risk and Early Warning Systems, 2019).[7] As noted above, the CREWS also contributes to the EW4All initiative as one of the funding mechanisms to achieve universal access to EWS. Furthermore, the CREWS signed the pilot GCF-SAP CREWS scaling-up framework for early warning with the GCF in 2023, which allows countries with ongoing or recently completed CREWS projects to receive fast-track access to GCF finance through SAP (Green Climate Fund and Climate Risk and Early Warning Systems, 2023; Green Climate Fund, n.d-b). Country and regional projects funded by the CREWS are implemented by the countries with the support of three implementing partners: the UNDRR, the World Bank Global Facility for Disaster Reduction and Recovery (WB-GFDRR), and the WMO, which are all actively involved in reducing the risks of countries and communities being exposed to disasters including climate change.

[7] The other targets include: (i) to substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015; (ii) to substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015; and (iii) to reduce direct disaster economic loss in relation to global gross domestic product by 2030.

In summary, the opportunities for the international community to enhance coherence and linkages across CIS and EWS have increased, though further coordination efforts are necessary. Policies and frameworks like the GFCS, the Sendai Framework, and the EW4All along with funding mechanisms such as the SOFF, the CREWS, the GCF and other climate funds provide avenues to enhance coordination in these areas.

b. Climate change adaptation

In the international climate negotiation and finance space, a growing number of policies and frameworks have embraced and supported the development and implementation of CIS and EWS under CCA action and support. As noted above, the Paris Agreement under article 7.1 established "the global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change" as a collective vision and direction for the international community to engage in required adaptation and resilience building efforts. Building on this and following the conclusion of a two-year Glasgow–Sharm el-Sheikh work programme, the fifth session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA5) adopted the UAE Framework for Global Climate Resilience in December 2023 (United Nations Framework Convention on Climate Change, 2023). This framework defines seven thematic and four cross-cutting dimensions as global targets for adaptation through paragraphs 9–10, offering a more structured approach to assessing collective adaptation progress. Specifically, article 10(a) of the framework mentions both CIS and EWS by targeting that:

> By 2030 all Parties have conducted up-to-date assessments of climate hazards, climate change impacts and exposure to risks and vulnerabilities and have used the outcomes of these assessments to inform their formulation of national adaptation plans, policy instruments, and planning processes and/or strategies, and by 2027 all Parties have established multi-hazard early warning systems, climate information services for risk reduction and systematic observation to support improved climate-related data, information and services.

To operationalize this framework, CMA5 also launched the UAE–Belém two-year work programme on indicators, tasked with identifying – and, where necessary, developing – robust indicators and potential quantified elements to measure progress towards the targets set out in decision 2/CMA.5, paragraphs 9–10 (United Nations Framework Convention on Climate Change, n.d-b). This represents a crucial advancement in improving the measurability and comparability of adaptation efforts among countries and stakeholders. The indicators are scheduled for adoption at COP30/CMA7 in November 2025.

EWS is also mentioned in article 8 of the Paris Agreement as part of the actions and support that should be enhanced to avert, minimize and address loss and damage associated with the adverse effects of climate change – both extreme weather events and slow onset events. Loss and damage remain a key issue in the UNFCCC negotiations, with discussions ongoing about how to effectively address it. Efforts to tackle loss and damage centre around the work of the Warsaw International Mechanism for Loss and Damage Executive Committee (WIM ExCom), which guides the implementation of the mechanism's functions to enhance cooperation and facilitation on loss and damage across five key areas: slow onset events, non-economic losses, comprehensive risk management, human mobility, and action and support (United Nations Framework Convention on Climate Change, n.d-f). Under the WIM ExCom, the most relevant area of ongoing technical work related to both CIS and EWS are comprehensive risk management which includes themes such as

climate risk assessment and climate services; climate and disaster impact monitoring; and options and solutions for comprehensive risk management including risk layering, and the interaction between risk assessment, risk reduction and risk finance (United Nations Framework Convention on Climate Change, n.d-e).

Yet another development on the loss and damage matter is the establishment of a Fund for Responding to Loss and Damage (FRLD) based on the agreement at COP27 in 2022, with a mandate to assist developing countries that are particularly vulnerable to the adverse effects of climate change in responding to economic and non-economic loss and damage. The establishment and operationalization of the Fund have just begun, including facilitating coordination and complementarity with other existing support mechanisms for responding to loss and damage. The FRLD was initially served by an interim Secretariat using seconded staff from the UNFCCC, the GCF and the UNDP while presently it is transitioning to a dedicated and independent Secretariat. As of April 2025, a total of USD 768 million has been pledged to the FRLD, representing 6 per cent of the pledges confirmed by the GCF for its second replenishment period (2024–2027) (United Nations Framework Convention on Climate Change, n.d-d; Green Climate Fund, n.d-a).

In summary, CIS and EWS, along with related technical work on risk financing, have emerged as foundational themes in CCA. This is facilitated through frameworks and mechanisms under the UNFCCC, such as the Paris Agreement, the Global Goal on Adaptation, the UAE Framework for Global Climate Resilience, and the efforts of the WIM ExCom. Additionally, it is understood that the FRLD has the potential to play a more prominent role in CIS and EWS in the future.

2. Progress and persistent barriers

Overall, there has been a considerable advancement in both CIS and EWS globally. For instance, over the past five years, improvements in CIS have been notable, with the global number of NMHS providing "advanced" climate services increasing from 8 to 15 (World Meteorological Organization, 2024). This reflects a significant leap in capacity and service delivery as recognized by the WMO. Concurrently, the number of NMHS providing only "basic" services has decreased by nearly half, representing a modest yet meaningful advancement in capacity (World Meteorological Organization, 2024). Furthermore, as of 2023, the number of countries covered by EWS has doubled to 101 compared to 2015.

However, large gaps remain, especially in those countries vulnerable to the effects of climate change. The EWS coverage as of 2023 was still half of the world (52 per cent or 101 countries). In addition, only 46 per cent of LDCs and 39 per cent of SIDS report the existence of MHEWS (United Nations Office for Disaster Risk Reduction and World Meteorological Organization, 2023). Similarly, countries in Africa and the Americas and Caribbean reported 45 per cent and 37 per cent MHEWS coverage respectively as of 2022, lagging behind the global average (United Nations Office for Disaster Risk Reduction and World Meteorological Organization, 2023).

This poses significant risks to people in those countries vulnerable to the effects of climate change. According to the midterm review of the Sendai Framework, reported economic losses of 1 per cent of global gross domestic product are likely an underestimate, and damage to and destruction of critical infrastructure remains unacceptably high (United Nations Office for Disaster Risk Reduction, 2023). Additionally, the number of people affected by disasters between 2012–2021 increased compared to the previous decade. There are similar trends in CIS, where of the available data from 179 WMO members, 33 per cent of NMHS produce climate services at only an "essential" level, and in Africa 15 per cent of countries have "less than basic" climate services capacities (World Meteorological Organization, 2024).

In the process of developing the GCF *Sectoral guide: Climate information and early warning systems* (Green Climate Fund, 2022c), the following were identified as potential barriers to CIS and EWS impact through GCF support: (i) limits of scientific prediction and the complexities of forecasting; (ii) lack of enabling environments for institutional effectiveness; (iii) limited governmental budgets allocated to NMHS and NDMAs; (iv) lack of coverage and scale for effective service delivery in terms of quantity and quality of "hard" infrastructure and institutions for ensuring the delivery and uptake of information; (v) market barriers to creating enabling conditions for CIS and EWS development; and (vi) uncoordinated interventions (Intsiful, Varley and Watkiss, 2022).

These barriers identified within the CIEWS sectoral guide align strongly with overarching barriers and challenges to CIS and EWS described below:

Uncertainty: The prediction of extreme weather and climate events, as well as cutting-edge approaches to medium- and long-range projections, underpins the CIS and EWS approach. Correspondingly, there are many promising avenues to enhance climate hazard modelling capacities through research and development. However, there also remain fundamental limitations to what can be known about future climate conditions, with some level of unavoidable uncertainty.

Inadequate data-collection: A key challenge to enhancements in predictive capacities relates to gaps and limitations in weather, climate, and other associated data and observations. LDCs, in particular, face significant gaps in climate and environmental observation data due to limited weather stations and other data-collection methods, limited infrastructure and information communication and technology capacity, and insufficient funding to support maintenance and/or expansion of observation networks.

Complexity of impact determination: Additionally, a key component of effective end-to-end EWS includes the provision of impact-based forecasts and warnings (IBFWs). It is well recognized that it is not enough to know what the weather or climate will be, but "what it will do" to people and property that will be affected (World Meteorological Organization, 2022). The purpose of IBFWs is to ensure that potential impacts are understandable to all end users in relevant terms, thus increasing their likelihood of taking advance action to reduce impacts. IBFW can also form the basis of anticipatory action to protect lives and livelihoods, in both the short- and long-term.

Timescales are broad: To be effective, CIS and EWS must address multiple temporal scales. However, persistent challenges remain in addressing long-term and slow onset climate-related hazards, and the majority of CIS and EWS just focuses on short- to medium-term extreme weather events. Thus, a key challenge is to ensure that CIS and EWS address multiple temporal scales through seamless prediction approaches that are relevant to decision-making in practice.

Private sector investments: As CIS and EWS are typically considered public goods, the potential value of public-private partnerships and private investment has only begun to be explored in recent years (Bruno Soares and Dessai, 2016). Existing challenges to private sector CIS and EWS investment include regulatory instability, poor coordination, and the tendency for companies to view climate services investments as risky or unprofitable, with benefits that are hard to monetize or realize quickly (Tall and others, 2014). Barriers to private investment are also reflected in the current GCF CIEWS portfolio, as will be explored and assessed further in this evaluation.

C. GCF CONTEXT – CLIMATE INFORMATION AND EARLY WARNING SYSTEMS IN THE GCF

The GCF has identified CIEWS as a core focus area. CIEWS is a cross-cutting theme that is relevant to all eight GCF results areas defined in the initial Results Management Framework (RMF) of the Fund – the first GCF policy on results management (Green Climate Fund, 2014a). EWS are also formally listed as one of four GCF "themes", underscoring its strategic role under the adaptation paradigm and the Fund's commitment to protecting vulnerable populations.

GCF's commitment to strengthening CIEWS is seen throughout its history. In GCF policies and documents, the terms "climate information" and "early warning systems" first appeared in 2014 within the institution's results frameworks, known as the GCF RMF and the GCF Mitigation and Adaptation Performance Measurement Frameworks (PMFs) (Green Climate Fund, 2014a; 2014b). These Board-approved policy documents noted a CIEWS indicator as requiring "further refinement" for the purpose of performance tracking of GCF investments. The second results framework of the GCF, known as the Integrated Results Management Framework (IRMF), adopted by the GCF Board in 2021, included a supplementary indicator specific to CIEWS interventions: supplementary indicator 2.4 tracks the number of beneficiaries (female/male) covered by new or improved EWS (Green Climate Fund, 2021b). In addition, the RMF/PMFs and IRMF contain indicators relevant to tracking the progress of GCF's investments in minimizing, averting and addressing loss and damage associated with the adverse effects of climate change. The indicators relevant to CIS and EWS in the RMF/PMFs and the IRMF are summarized in Table 2.

Table 2. List of RMF/PMF and IRMF indicators relevant to CIS and EWS

No.	Results framework	Indicator code	Indicator
1	RMF/PMF	A1.1	Change in expected losses of lives and economic assets (USD) due to the impact of extreme climate-related disasters in the geographic area of the GCF intervention
2	RMF/PMF	A6.2	Use of climate information products/services in decision-making in climate-sensitive sectors
3	RMF/PMF	A7.1	Use by vulnerable households, communities, businesses and public sector services of Fund-supported tools, instruments, strategies and activities to respond to climate change and variability
4	RMF/PMF	A7.2	Number of males and females reached by (or total geographic coverage of) climate-related EWS and other risk reduction measures established/strengthened
5	IRMF	2.4	Beneficiaries (female/male) covered by new or improved EWS (number of individuals)
6	IRMF	2.7	Change in expected losses of lives due to the impact of extreme climate-related disasters in the geographic area of the GCF intervention (number of individuals)
7	IRMF	3.1	Change in expected losses of economic assets due to the impact of extreme climate-related disasters in the geographic area of the GCF intervention (value in USD)

Recognizing the complex, persistent, and interrelated challenges of improving CIEWS delivery, the GCF Secretariat developed the CIEWS sectoral guide, as a guiding document for GCF's accredited entities (AEs) in formulating GCF funding proposals (FPs).[8] It outlines three paradigm-shifting pathways for achieving CIEWS that can be integrated into both mitigation and adaptation interventions. These pathways are: (i) strengthening CIS, (ii) promoting impact-based MHEWS and early action, and (iii) leveraging CIEWS for uptake, investment and financial decisions.

In conjunction with the development of the sectoral guides for all 10 supported sectors, the GCF Secretariat conducted a comprehensive exercise to classify and tag existing GCF projects and programmes according to paradigm-shifting pathways outlined in each sectoral guide. This exercise involved applying a set of keywords associated with each paradigm-shifting pathway for classification, which was then validated by sector specialists within their respective fields. Although there are inherent and conceptual challenges in applying this methodology, the internal exercise enabled the GCF to estimate the allocation of its investments across sectors by identifying sector-based percentage breakdowns for each project and programme.

According to data from this exercise, there are currently 89 projects and programmes relevant to CIEWS out of a total of 297, amounting to USD 1.3 billion as of May 2025. These projects/programmes span both single and multiple-country efforts across 91 countries, including 29 SIDS, 33 LDCs and 38 African States. The CIEWS projects primarily consist of traditional hydro-meteorological modernization and EWS projects, as well as projects that apply CIEWS in sector-specific resilience building efforts. The availability of this sectoral data informed target setting for the GCF Strategic Plan for 2024–2027.

The Strategic Plan for the Green Climate Fund 2024–2027 (USP-2) was adopted at B.36 in 2023. The USP-2 is the first GCF strategy to contain 11 concrete programmatic target results to be achieved during the Fund's strategic period. Target 3 identifies a goal of protecting 50 to 60 developing countries particularly vulnerable to the adverse effects of climate change with new or improved EWS. For the first year of the USP-2 period in 2024, the Secretariat reported that 18 such countries had been brought under protection by these systems, recording 36 per cent of the lower range of the target (Green Climate Fund, 2025a). The USP-2 further lays out the need for immediate and systematic adaptation responses through GCF's planning and investment windows based on the GCF adaptation approach: RPSP, PPF, PAP and SAP.

The CREWS initiative, discussed in section B, offers an added advantage of being well-situated to leverage investments across multiple investment mechanisms. In 2023, the GCF and CREWS launched the *GCF-SAP CREWS scaling-up framework for early warning* (Green Climate Fund and Climate Risk and Early Warning Systems, 2023). This is a joint framework of the GCF and CREWS to fast-track access to GCF finance through its SAP for countries with ongoing or recently completed CREWS projects (Climate Risk and Early Warning Systems, 2025). Currently the framework is in the piloting and gap-filling phases, with one CREWS-supported project having been approved by the GCF Board in 2025.[9]

The GCF reports annually to the UNFCCC/COP on GCF projects/programmes aimed at minimizing and addressing loss and damage in developing countries, while the concept of loss and damage continues to be refined at both the Fund and COP levels. A 2021 external report assessing options for the GCF to finance loss and damage found that out of 165 projects approved up to B.27 and

[8] This document has been removed from the GCF public website as of April 2025.
[9] The first SAP project approved under the SAP-CREWS partnership is SAP048 (Green Climate Fund, 2025b), which was approved at B.41.

analysed by the study, 40 (24 per cent) demonstrated the concept of loss and damage (Kempa and others, 2021). In addition, 23 GCF projects that explicitly supported measures to avert, minimize, and address loss and damage aimed to enhance the climate resilience of vulnerable communities through CIEWS interventions, including collecting and disseminating climate information, developing EWS, and establishing weather-index insurance. Importantly, this analysis illustrated GCF investments across slow onset (e.g. glacial melt, salinization, rangeland degradation) and rapid onset (e.g. floods, storm surges, heatwaves) climate risks, while also emphasizing future opportunities to enhance financial instruments for loss and damage, such as risk transfer and social protection mechanisms, contingency finance, and catastrophe bonds.

Table 3 below provides, in chronological order, the list of GCF policies and operational resources relevant to CIEWS, as well as GCF programming and results-based management more broadly, as pertinent to this evaluation.

Table 3. GCF flagship documents linked to CIEWS and results management

No.	Category	Theme	Year	Document
1	Policy	Results	2014	Initial Results Management Framework of the Fund (Green Climate Fund, 2014a)
2	Policy	Investment	2014	Initial Investment framework (Green Climate Fund, 2020a)
3	Policy	Results	2014	Mitigation and adaptation performance measurement frameworks (PMFs) (Green Climate Fund, 2014b)
4	Policy	Investment	2015	Further development of the initial investment framework: sub-criteria and methodology (Green Climate Fund, 2015a)
5	Policy	Accreditation, results	2015	Monitoring and accountability framework for accredited entities (Green Climate Fund, 2015b)
6	Strategy	Readiness	2019	Readiness and Preparatory Support Programme: Strategy for 2019−2021 (Green Climate Fund, 2019)
7	Policy	Results	2021	Integrated Results Management Framework (Green Climate Fund, 2021b)
8	Policy	Investment	2022	Principles for demonstrating the impact potential of GCF-supported activities (Green Climate Fund, 2022b)
9	Strategy	-	2020	Strategic planning for 2020–2023: Update to the Strategic Plan of the GCF (Green Climate Fund, 2020b)
10	Strategy	-	2023	Strategic Plan for the Green Climate Fund 2024–2027 (Green Climate Fund, 2023a)
11	Operational document	Results	2022	IRMF draft results handbook (Green Climate Fund, 2022a)
12	Operational document	CIEWS	2022	Sectoral guide: Climate information and early warning systems (Green Climate Fund, 2022c)[10]
13	Operational document	CIEWS Partnership	2023	GCF-SAP CREWS scaling-up framework for early warning (Green Climate Fund and Climate Risk and Early Warning Systems, 2023)
14	Strategy	-	2023	Readiness Strategy 2024–2027 (Green Climate Fund, 2023b)

[10] This document has been removed from the GCF public website as of April 2025.

D. THEORY OF CHANGE

1. CIEWS DEFINITION

While the Fund commonly uses the term CIEWS in its documents and sectoral classification, it has yet to adopt a formal definition of CIEWS within its documentation. In the simplest terms, CIS is the provision and use of climate data, information and knowledge to assist decision-making, while EWS focuses on the provision of warnings linked to all hazards (World Meteorological Organization, 2024). Examining the four pillars of EWS and the six components of the climate services value chain together as covered in section B, however, it is clear that there are more areas of overlap than differences (International Institute for Sustainable Development, 2003). With increasing evidence and awareness of the interlinkages between climate change, increases in extreme weather and climate events, and disasters – and the potential for synergies, efficiencies, and alignment between CIS and EWS – there is value in establishing a common definition of CIEWS that is comprehensive, yet precise enough to inform rigorous evaluation approaches.

There are strong opportunities for synergies across the CIS and EWS domains, but also a need to consider how these relate to each other to enable a coherent approach to CIEWS. The Asian Development Bank (ADB, 2024) notes that a combined CIEWS approach "goes beyond facilitating institutional, community and individual response to impending hazards. Ideally, it promotes long-term risk reduction and resilience". Similarly, there are recent and ongoing efforts to develop "seamless" CIS, which enables the integration of weather and climate information across different timescales, from short-term weather forecasts to long-term climate projections (Brunet and others, 2010; Palmer and others, 2008). WMO's World Climate Research Program and World Weather Research Program are developing a seamless prediction system to enable a wide range of weather, climate, hydrological and environmental predictions (World Meteorological Organization, 2015). There are also growing efforts to integrate climate information across multiple timescales within EWS, including for medium- and long-range hazards (Fakhruddin and others, 2021). At the same time, the World Adaptation Science Program has identified the importance of creating "early warning systems for adaptation" through the combined provision of accurate short-range forecasts for triggering early warnings and anticipatory action, along with information about the past, present, and medium-range future to inform seamless adaptation and preparedness strategies (Sultan and Rosenzweig, 2021).

Recognizing the broader trends towards convergence of CIS and EWS in both practice and policies frameworks (see also section 0), this evaluation will make our own definition of CIEWS as below, particularly for assessing the GCF portfolio of the CIEWS projects/programmes.

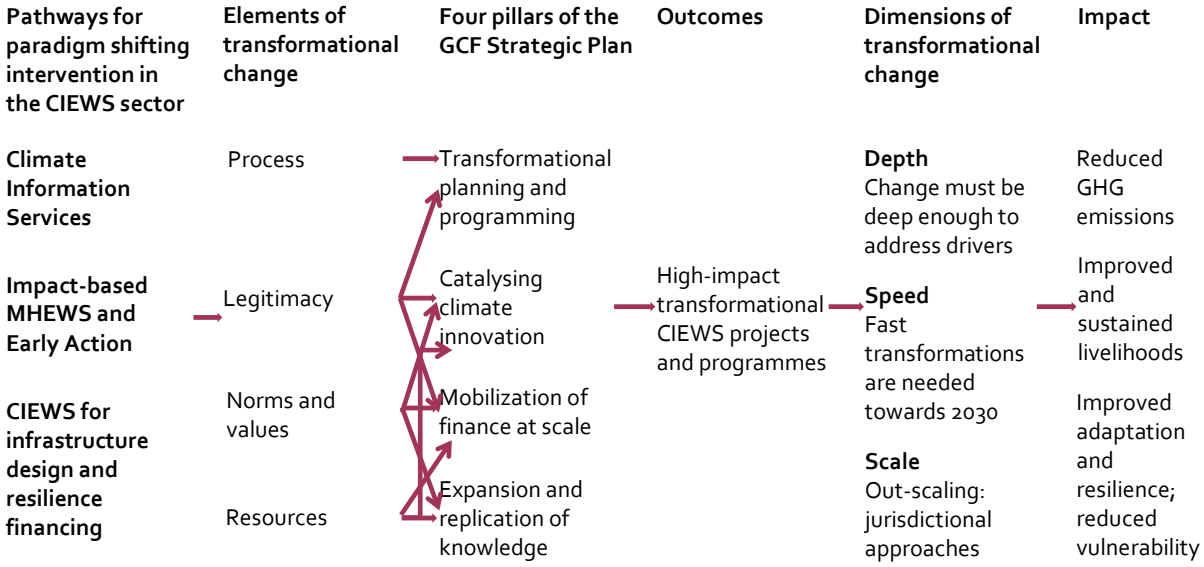
Box 1. CIEWS definition for the evaluation

A set of systems designed to understand, anticipate and manage risks related to the effects of climate change with the aim of protecting lives, livelihoods, assets and investment. For populations, communities, governments, and both public and private organizations, CIEWS rely on the collection, monitoring, and analysis of weather and climate data to enable understanding of historical and present trends and prediction of future conditions, as well as warning, communication and dissemination networks. These systems facilitate the making and sharing of evidence-based decisions that lead to preparedness and timely actions to reduce climate risks and increase adaptive capacity to climate change.

2. CIEWS THEORY OF CHANGE

Since its inception, GCF has been promoting CIEWS largely through an implicit ToC. As shown in Figure 1, the CIEWS sectoral guide outlines pathways for paradigm shifts within the sector, linking them to elements of transformational change and the four components of the Updated Strategic Plan for the Green Climate Fund 2020–2023. While this high-level demonstration is valuable, developing a more structured ToC will provide a framework for this evaluation, allowing for an assessment of the extent to which the GCF has supported and promoted CIEWS.

Figure 1. Elements of transformational change linked to the four pillars of the GCF Strategic Plan

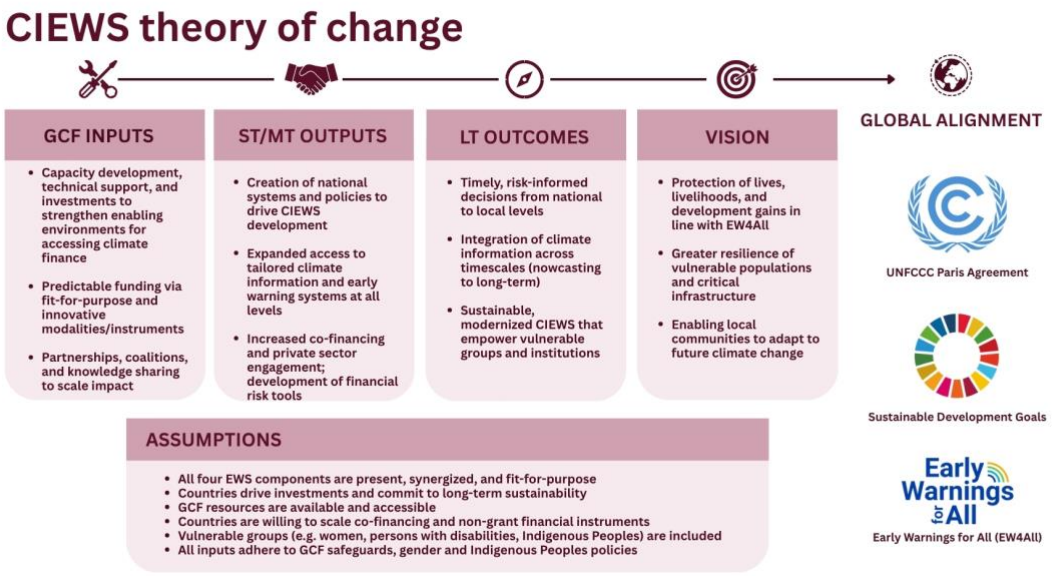


Source: Green Climate Fund (2022c).

Based on a review of eight GCF documents using MaxQDA analytical software and through feedback gathered during a two-hour ToC workshop with CIEWS experts in the GCF Secretariat on 24 March 2025, which used an interactive online Miro board, an abridged, yet explicit, ToC for the GCF CIEWS approach was developed (Figure 2).[4]

[4] The documents analysed to develop the draft ToC included: (i) Strategic Plan for the GCF 2024–2027; (ii) Updated Strategic Plan for the GCF 2020–2023; (iii) GCF Integrated Results Management Framework; (iv) IRMF Results Handbook; (v) GCF initial Results Management Framework; (vi) GCF CIEWS sectoral guide; (vii) GCF-SAP CREWS scaling-up framework for early warning; and (viii) Initial Investment Framework: Activity-specific Sub-criteria and Indicative Assessment Factor.

Figure 2. CIEWS theory of change



Abbreviations: ST – short-term; MT – medium-term; LT – long-term

As shown in Figure 2, the overarching theory is that GCF should provide inputs in the form of: (i) capacity development, technical support, and investment to foster enabling environments for accessing climate finance; (ii) predictable funding via fit-for-purpose and innovative modalities/instruments; and (iii) partnerships and coalition-building and knowledge-sharing for investment at scale. The end-goals defined through the GCF CIEWS vision will then be achieved through: (i) protecting lives, livelihoods, and development gains in line with the EW4All initiative; (ii) fostering greater resilience of vulnerable populations and infrastructure; and (iii) enabling local communities to adapt to future changes in climate. The theorized causal linkages between inputs, short-/medium-term outputs, and long-term outcomes are explained further below.

a. Overview of GCF inputs

GCF operates through several funding windows to support various stages of project origination, development and implementation. Through its complementary RPSP and PPF modalities, GCF provides targeted capacity development and technical assistance to enhance country enabling environments for carrying out climate actions in line with the UNFCCC and Paris Agreement.

The RPSP aims to develop countries' human, technical and institutional capacity, as well as to strengthen policy frameworks, sectoral expertise and knowledge generation and sharing to enhance development and implementation of climate investments. A key objective of the RPSP includes building country capacities for planning processes and implementation of national-level climate actions including NAPs. Ideally, national strategic policy frameworks, including nationally determined contributions (NDCs), NAPs, and long-term strategies generate pipelines for successful GCF concept notes (CNs) and proposals that are driven by country needs.

Recognizing that a resource gap may prevent countries and supporting AEs from translating country priorities into CNs and FPs, the PPF supports activities that enable the development of high-quality proposals that align with GCF criteria. PPF supports feasibility and other studies (e.g.

environmental, gender, risk assessments), project design and preparation, and technical advisory services. Notably, both RPSP and PPF actively prioritize support to direct access entities (DAEs).

The PAP is the standard funding mechanism for GCF projects and programmes, while the SAP is designed to streamline and expedite the application, review and post approval stages of small-scale projects with high climate impact potential and low social and environmental risks. The GCF Secretariat further engages in strategic partnerships and builds coalitions, as well as strategy and knowledge generation, management and sharing, that can leverage and maximize the impact of funding windows at scale.

b. Linkages between GCF inputs and short-term/medium-term outputs

Assuming a sufficiently conducive context for CIEWS activities, the inputs described above are intended to generate a series of short- and medium-term outcomes, including:

- Creation of national systems and policies specific to driving CIEWS development.
- Increase in coverage, delivery and access of user-driven and tailored CIEWS, including at local levels through community engagement.
- Increased co-financing, local finance, and private sector engagement; and development of financial and analytical tools to better manage climate risks.

It is intended that GCF inputs geared towards enhancing broader national systems and policies feed directly into creating conditions that also drive CIEWS development. For example, NAPs created under the RPSP can identify CIEWS gaps and needs and set investment priorities, including leading to GCF-funded project proposals. As another example, PPF aims to increase engagement with the private sector, promote investment at scale, and increase access to the GCF by DAEs, all of which may strengthen CIEWS implementation.

CIEWS investments under PAP and SAP/SAP-CREWS are aimed at contributing directly to activities that increase coverage, delivery and access to CIEWS that are tailored and meet users' needs through engagement with beneficiaries, including at the local level. Importantly, EWS have been identified as a strong fit for the SAP window, including through the SAP-CREWS scaling-up framework that builds on successful prior actions financed by the CREWS initiative. PAP and SAP projects may support core and traditional CIEWS activities such as hydromet modernization, MHEWS, and risk financing including insurance programmes. For example, risk financing support may include mechanisms such as index insurance or forecast-based anticipatory action. While to date, most CIEWS investment has been in the form of grants and co-financing, various GCF documents including the CIEWS sectoral guide indicate a strong desire to expand the range of financial instruments to enable private sector support throughout the CIEWS value chain, including through public-private partnerships, insurance and climate risk finance products, bonds, equity, and guarantees.

Capacity development under the RPSP and PPF can further set the stage for successful PAP and SAP project implementation. For example, an increased focus on enhancing DAE capacities may help to ensure that CIEWS projects and programmes are context-specific, meaning they are designed through extensive in-country consultation and that implementation is locally driven.

c. Linkages between long-term outcomes and GCF CIEWS vision

If the assumptions about internal and external context that underpin the ToC hold true and building upon the short-/medium-term outputs, the following long-term outcomes will be achieved:

- Timely, risk-informed, and effective decisions from national to local levels

- Seamless integration of CIS across timescales to assess, avoid, and reduce climate risks
- Sustainable and modernized CIEWS as a public good that empowers vulnerable groups and institutions

As countries develop capacities and enabling environments for CIEWS and, subsequently, increase the coverage, delivery and access of tailored CIS and EWS from national to local scales, it is theorized that this should produce timely and risk-informed decisions that enable adaptation to future changes in climate.

Investments in technical capacities, policy development and coordination for modernized CIEWS can enhance the ability to integrate early warning and climate information across timescales – from now-casting to seasonal forecasts to long-term projections – to reduce climate risks in combination with financial and analytical tools. Alongside technical investments, there is also a need to ensure social inclusion of women and Indigenous Peoples in CIEWS project origination, as well as to establish pathways for the integration of Indigenous, traditional and local knowledge within CIEWS design and delivery. Increasing co-financing, local finance and private sector involvement can contribute to the sustainability of CIEWS over long-term horizons while also ensuring that CIEWS remains a country-driven public good. Notably, this theory maintains that ensuring public access to CIS and EWS is crucial to ensuring that the lives and livelihoods of vulnerable populations and critical infrastructure are protected. It is envisioned that sustained community engagement and targeted capacity development for CIEWS will empower vulnerable groups and key institutions to act in response to information, advisories, and warnings provided through CIS and EWS.

In theory, this combination of long-term outcomes will achieve the end-goals defined in the GCF CIEWS vision, representing a transformative ambition to achieve a paradigm shift in the CIEWS sector towards: (i) protecting lives, livelihoods, and development gains in line with the EW4All initiative; (ii) fostering greater resilience of vulnerable populations and infrastructure; and (iii) enabling local communities to adapt to future changes in climate. These impacts will support the broader GCF vision of low-emission climate resilience in the context of sustainable development and implementation of the UNFCCC and Paris Agreement.

E. Evaluation framework and methodology

1. Evaluation framework

As noted in section A.2, this evaluation will concentrate on two key research areas (see Figure 3 below). Firstly, it will assess the GCF approach to CIEWS, specifically examining how the GCF chooses to collaborate with other CIEWS actors and leverages its programmatic approaches and funding windows, such as the RPSP, PPF and SAP to support and promote CIEWS. GCF's approach essentially relates to what GCF does or delivers and hence represents the GCF input section of the ToC (Figure 2).

Secondly, the evaluation will assess the GCF's portfolio of CIEWS projects/programmes, focusing on the extent to which these GCF-funded interventions effectively make CIEWS available, accessible, and responsive, with the aim of protecting lives and livelihoods and strengthening resilience in these countries. The evaluation of the GCF's portfolio involves examining progress against the short- to medium-term output section of the ToC, where countries through the support of AEs are delivering GCF-funded projects/programmes based on GCF inputs and support. These outputs of GCF-funded projects/programmes are expected to lead to outcomes, as depicted in the ToC's long-term outcome section. Since long-term outcomes and benefits are often realized only

after the projects and programmes have concluded, it is essential to clearly articulate the link from outputs to outcomes and assess the potential of, if not realized, outcomes of CIEWS projects/programmes in line with the ToC. Under the evaluation of the GCF portfolio, the long-term outcome section of the ToC will be evaluated through evaluation criteria such as impact, sustainability, scalability and replicability.

In summary, these two research areas provide a framework for this evaluation to examine the key elements of GCF's work to support CIEWS. Table 4 below provides the list of key evaluation questions to be answered under each research area. In addition, the evaluation matrix in Appendix 1 further elaborates on these research areas, including main and sub-evaluation questions, sources of data and information, and methods for answering the questions. All evaluation questions are meant to be answered through the triangulation of traceable and relevant information, and data and observations collected from various sources.

Figure 3. Two research areas of the evaluation

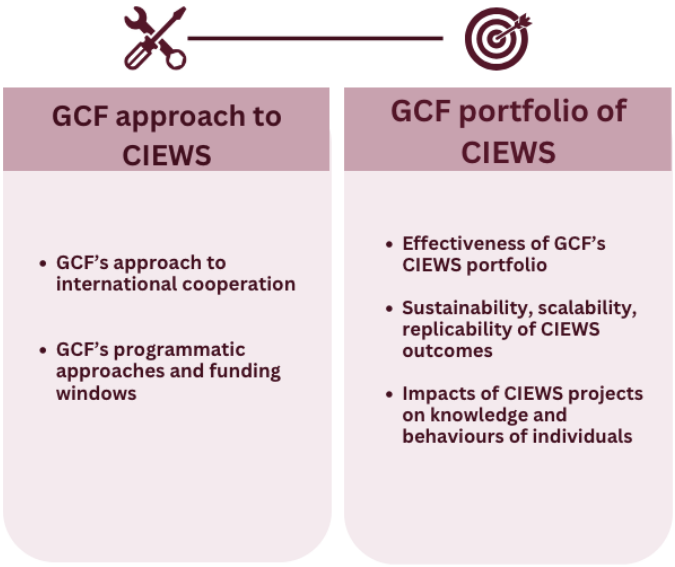


Table 4. Evaluation questions by research area and evaluation criterion

Scope	GCF evaluation criteria	Evaluation questions
Approach	Coherence and complementarity	To what extent has the GCF been able to enhance international cooperation to promote and strengthen CIEWS both within countries and at international forums?
	Efficiency	To what extent is GCF leveraging its programmatic approaches and funding windows (e.g. RPSP; PPF and PAP versus SAP) to support CIEWS?
Portfolio	Relevance	To what extent do CIEWS interventions align to needs and gaps recognized by governments (i.e. national – NMHS, NDMAs and sub-national governments) within target countries?
	Effectiveness	To what extent has the CIEWS portfolio been successful or unsuccessful in terms of: • Enhancing or making CIS available to users? • Making impact-based multi-hazard EWS available, accessible and

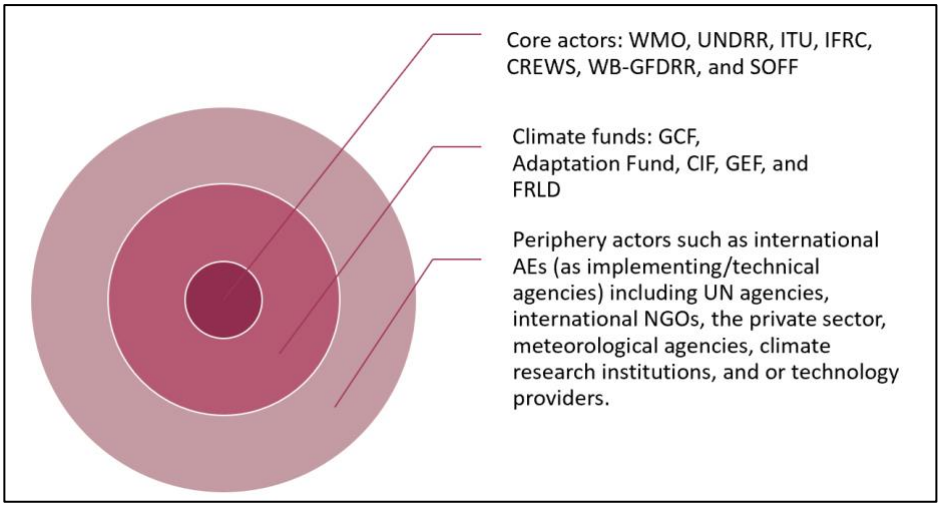
Scope	GCF evaluation criteria	Evaluation questions
		responsive? • Improving and leveraging CIEWS for investments?
	Impact	What are the key changes in knowledge and behaviours of individuals within target communities following CIEWS interventions?
	Sustainability and country ownership	Are the results achieved from GCF-funded CIEWS projects sustainable without reliance on external support?
	Gender equity	To what extent have CIEWS interventions fostered women's participation and leadership? What key factors have driven gender equality results?
	Replication and scalability	Are there indications that the results achieved from GCF-funded CIEWS projects are/or will be scalable or replicated beyond intervention locations and stakeholder groups?
	Unexpected results, both positive and negative	What are some unexpected positive and negative results observed in CIEWS interventions?
Cross-cutting	Innovativeness	Have CIEWS interventions supported by the GCF leveraged on innovative approaches, practices and technologies?

2. GCF'S APPROACH TO CIEWS

a. Complementarity and coherence

The assessment of GCF's approach to CIEWS will utilize evaluation criteria such as coherence, complementarity, and efficiency. Considering the GCF Board decision *B.17/04: Matters related to guidance from the Conference of the Parties: Complementarity and coherence*, which initiated the establishment of a framework to strengthen complementarity and coherence with other climate finance institutions, the evaluation will examine the extent to which the GCF has enhanced collaboration and cooperation with other actors to promote and strengthen CIEWS both within developing countries and at international forums (Green Climate Fund, 2017). This involves categorizing CIEWS actors into core and peripheral groups. By organizing these actors and their investments in CIEWS, the evaluation seeks to identify remaining gaps that the GCF could address in CIEWS. Figure 4 illustrates the main CIEWS actors at the global level (also refer to section 0).

Figure 4. CIEWS actors at the global level



Abbreviations: WB-GFDRR – World Bank Global Facility for Disaster Reduction and Recovery; CIF – Climate Investment Funds; GEF – Global Environment Facility; NGO – non-governmental organization.

To assess the complementarity and coherence of activities and investments of CIEWS actors in relation to the GCF's efforts, the evaluation team will conduct a desk-based review and data analysis based on CIEWS investments information available from the Organisation for Economic Co-operation and Development's Development Assistance Committee (OECD DAC) database as well as WMO/UNDRR Global Observatory.[12] It will also undertake online and or in-country key informant interviews (KIIs) and focus group discussions (FGDs) with these actors for triangulation. Essentially, these serve as a benchmarking or comparators study, where the GCF's work on CIEWS is compared and evaluated against that of other actors. The exercise will also cover an evaluation question on the extent to which the pilot GCF-SAP CREWS scaling-up framework (signed in 2023) and the Framework for Collaboration between the SOFF and Climate Investment Funds (CIF), CREWS, Global Environment Facility (GEF), and GCF (signed in 2023) have demonstrated potential or shown early positive/negative signs for scaling-up or catalysing synergies in CIEWS work.

b. Programmatic approaches

The evaluation of the GCF's approach to CIEWS also involves assessing how efficiently and effectively the GCF leverages its programmatic approaches and funding windows to support CIEWS. These programmatic approaches include working with DAEs versus international accredited entities (IAEs), engaging with the public versus private sectors, single-country versus multi-country programming to achieve efficiency in attaining CIEWS results. Further considerations under these programmatic approaches are discussed below.

Single- versus multi-country: The GCF portfolio includes both single- and multi-country CIEWS projects/programmes. The significance of regional approaches, due to the cross-boundary nature of climate hazards, suggests that a multi-country modality may be particularly relevant in the CIEWS context. However, understanding the trade-offs and relative benefits between single- and multi-country approaches is essential. Additionally, there are multi-country projects/programmes within

[12] The Global Observatory provides information about financing from multilateral development banks and climate funds in support of EWS to build coherence, alignment, and assist in the understanding of funding gaps. See Microsoft Power BI. Accessed as of May 2025.

the same region, as well as those spanning across multiple regions. Key questions will focus on whether multi-country projects/programmes are well-suited to enabling country-driven approaches, strengthening country ownership, facilitating cross-boundary knowledge-sharing, scaling up results and impacts, and effectively serving project/programme objectives when implemented across more than one region. Other areas of inquiry include assessing barriers and opportunities in monitoring and tracking results for these types of projects and programmes.

DAE versus IAE: AEs develop project ideas, submit FPs, and implement GCF-funded projects/programmes. AEs can be private, public, non-governmental in nature, and may operate at national, regional or international levels. To date, the vast majority of CIEWS projects/programmes have been carried out in partnership with IAEs who have extensive experience in the sector; however, it is assumed that DAEs have better knowledge of national and local contexts to ensure the appropriateness of proposed project/programme activities and easier engagement with government bodies, local organizations and communities. DAEs may need capacity development on GCF application processes and project/programme implementation. Both the RPSP and PPF prioritize support to DAEs. The evaluation will examine both the strengths and weaknesses of DAE and IAE approaches towards CIEWS.

Public versus private sector: Under the USP-2, the GCF commits to mobilizing private sector capital by optimizing its risk appetite and utilizing flexible financing instruments to unlock the financial flows needed by developing countries to deliver on their NDCs, NAPs and long-term strategies, which closely relate to effective CIEWS interventions. A key goal of CIEWS interventions is to ensure sustainability beyond the project lifecycle, and private sector participation is viewed as crucial, for example through approaches such as public-private partnership business models, climate analytics for risk management in the private sector, and innovative and blending financing to leverage private sector funding sources.[13] To date, however, the majority of CIEWS investments have been grant-based and in the public sector. The evaluation will examine the use of public versus private sector approaches including how the GCF can catalyse more resources into CIEWS from the private sector.

c. Funding windows

Furthermore, the evaluation will assess the extent to which the RPSP – both the previous strategy up to 2023 and the transitional arrangement to the new RPSP 2024–2027 during 2024–2025 – as well as the PPF facilitate the creation of an enabling environment for CIEWS programming.

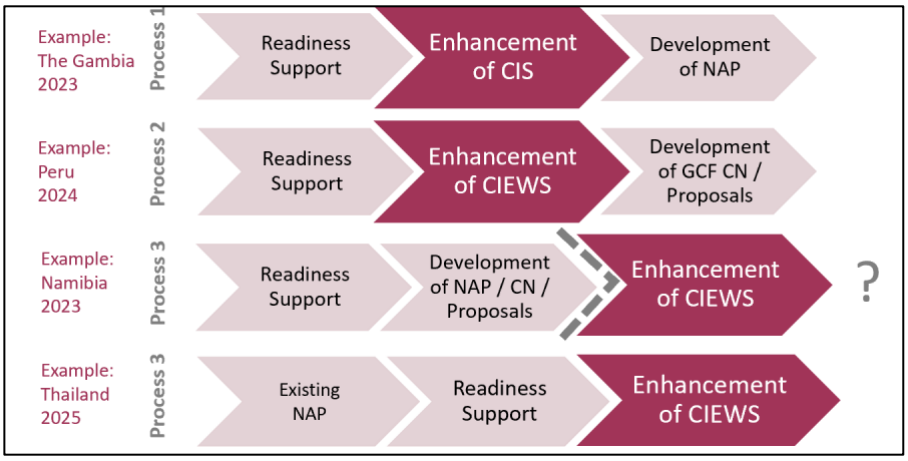
Readiness Programme

To date, there is a presumed link between the RPSP and CIEWS projects/programmes suggesting that readiness is not anchored in sector-specific expertise but rather enables the development of NAPs, NDCs, vulnerability and adaptation assessments, and other national frameworks. However, a preliminary examination of the ToCs in 12 approved readiness proposals (2021–2025) that contained key CIEWS terms (“climate information”, “climate data”, “early warning”, or “climate services”) demonstrates that the linkages between readiness support and CIEWS may be more varied and complex than initially hypothesized, with at least three other illustrative scenarios of readiness and CIEWS connections in evidence. In illustrative scenario 1, readiness support contributes to the improvements in CIS, which in turn facilitate data-driven approaches to NAP development. In illustrative scenario 2, readiness support enhances CIS and/or EWS – largely through technical capacity, governance mechanisms, and coordination – which enables the

[13] See Green Climate Fund (2022c).

development of GCF CNs or FPs. Scenario 3 describes the presumed readiness/CIEWS linkage. Finally, in illustrative scenario 4, a country (or countries) may have an existing NAP or other national framework that emphasizes how CIEWS and readiness support is used to directly support the enabling environment to implement CIEWS.[14]

Figure 5. Scenarios depicting potential connections between Readiness Programme and CIEWS[15]



Project Preparation Facility

The PPF provides AEs with grants or technical services to develop FPs. Under PPF services, GCF provides project preparation support through a roster of pre-approved consultancy firms. Currently, there are eight approved firms under PPF service while the GCF Secretariat has recently launched a request for proposals to recruit additional firms.

Initial scoping shows that the PPF supports CIEWS by funding activities such as feasibility studies, risk analysis, stakeholder engagement, and technical design. PPF grants generally fall into three categories:

- CIEWS-focused projects: where CIEWS is the central objective.
- Projects using CIEWS as an enabler: for example, urban flood management or agriculture and food security.
- Broader projects with CIEWS elements: for example, agricultural and livelihoods resilience where CIEWS plays a supporting role.

Importantly, PPF is administered on a first-come, first-served basis and is sector agnostic. This can create a key tension in achieving other PPF objectives. For example, while there is a desire to use PPF to effectively leverage co-financing, some funders have defined sectoral priorities, which may

[14] It is important to note that these illustrative pathways are based only a small number of grants and thus are preliminary and need further investigation during the evaluation, either through an AI-driven analysis in parallel to the grants analysis, or a randomized sample or cohort approach over a specified time frame. Additionally, while preliminary analysis examined ToCs in approved readiness proposals, careful analysis of the project/programme's logistical framework may yield more detailed insight about the pathways through which readiness supports CIEWS.

[15] The readiness grants reviewed include: GMB-RS-004: Enabling the National Adaptation Plan Formulation and Implementation process and other adaptation planning processes in The Gambia (2023); PER-RS-006 Strengthening capacities for NDC and NAP implementation in Peru improving private sector involvement, financial innovation and reporting (2024); NAM-RS-007 Strengthening Adaptation Planning and Coordination in Namibia (2023); and THA-RS-010 Enhancing Thailand's Capacity for Climate Adaptation through Risk-informed Anticipatory Actions to Flood and Drought (2025).

limit synergies. Additionally, the consultancy services under PPF for CIEWS-related proposals are not specific to the sector. Where linkages with readiness, particularly through NAPs and vulnerability and adaptation assessments, are present, it is theorized that PPF-funded proposals are more likely to be investment-ready and aligned with country-identified priorities in the CIEWS sector.

Regional-based approach

In September 2023, the GCF Executive Director announced her vision and reform agenda, "50 by 30", aiming to enable the Fund to efficiently manage USD 50 billion by 2030. As part of this reform agenda, a new organizational structure was introduced, operationalizing a regional model to support investments in developing countries starting mid-2024. This regional model is based on the "cradle to grave" approach, where support to countries begins with country programming, building institutional capacities, and formulating CNs and FPs for climate actions through readiness and PPF support, ultimately leading to the implementation of climate change projects and programmes in a more integrated and holistic manner. The new structure also places greater emphasis on results and impact. While it may be too early to assess the effects of the new regional structure on GCF's support to CIEWS, this evaluation will examine how the GCF's new organizational structure might (not) have facilitated efficient support and investment in CIEWS across regions.

3. GCF'S PORTFOLIO OF CIEWS PROJECTS

The second area of research to be undertaken in this evaluation is the assessment of the GCF's portfolio. The evaluation will assess the effectiveness of the GCF's portfolio of CIEWS projects/programmes by categorizing CIEWS projects/programmes into clusters and examining the extent to which the CIEWS portfolio has been successful or unsuccessful in terms of: (i) enhancing or making CIS available to users, (ii) making impact-based multi-hazard EWS available, accessible and responsive, and (iii) improving and leveraging CIEWS for investments. This area of research also involves assessing the evidence of (both realized and potential) CIEWS impacts, sustainability, scalability and replicability.

a. Establishing a list of CIEWS projects

To conduct a portfolio evaluation, it is essential to first establish a list of CIEWS projects and programmes that fall under the CIEWS portfolio. As mentioned in section C, the GCF Secretariat has conducted a comprehensive exercise to classify and tag existing GCF projects and programmes according to the paradigm-shifting pathways outlined in each sectoral guide. Given that the tagging work was technically overseen by CIEWS sectoral experts, the evaluation will use this list as a basis and modify it as necessary for the purpose of this evaluation. For instance, if the evaluation team identifies projects that appear to be incorrectly tagged or omitted as CIEWS, these will be removed from or added to the Secretariat's list to create an updated list of CIEWS projects and programmes for this evaluation. Further details on the methodology for establishing a list of CIEWS projects for this evaluation are available in Appendix 2.

As of June 2025, the evaluation team identified an additional 42 projects and programmes likely linked to CIEWS, starting where the Secretariat's list ended. The identification of additional CIEWS projects/programmes was done by a combination of a review of existing documents related to sectoral tagging work as well as the application of artificial intelligence (AI) where newly approved projects were vetted by AI and subsequently verified by the evaluation team. This resulted in a new total of 131 CIEWS projects and programmes that may be considered under the portfolio evaluation. The final list of projects as of today is provided in Appendix 3.

b. Cluster study

The list of CIEWS projects and programmes established from the above exercise will serve as the basis for the portfolio evaluation. To address the evaluation question regarding the effectiveness of the CIEWS portfolio, the evaluation team will conduct a cluster study. In this study, the list of CIEWS projects and programmes will be categorized into clusters according to the paradigm-shifting pathway they advance, then analysed and assessed against rubrics tailored for each cluster. Given the diversity of CIEWS projects/programmes, a cluster-based assessment will help identify, organize and analyse common challenges and opportunities within each cluster. Ultimately, the study will extract lessons and good practices within each cluster to inform GCF's future programming efforts.

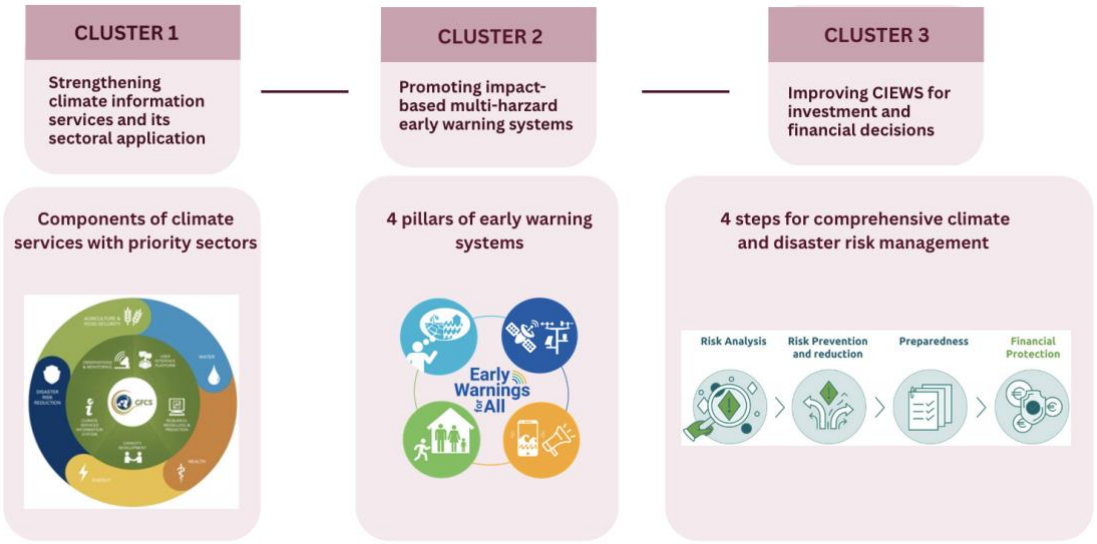
Each CIEWS project/programme will be categorized into one of three clusters based on paradigm-shifting pathways from the CIEWS sectoral guide. These are:

- Cluster 1: strengthening CIS and its sectoral application
- Cluster 2: promoting impact-based MHEWS
- Cluster 3: improving CIEWS for investment and financial decisions

The evaluation team will utilize AI with a temperature setting of 0 (i.e. the lowest level of freedom given to AI) to categorize the list of CIEWS projects/programmes into the three clusters, thereby ensuring consistent results with each run. Following this, samples for each cluster of this study will be selected, along with explanations of the criteria and process/methodology used for selecting those samples.

Next, selected samples for each cluster will be analysed and assessed against rubrics developed for each cluster. The rubrics will serve as an evaluation tool to assess the effectiveness of the interventions through the examination of FPs, annual performance reports (APRs), and other documents available per project/programme. Each sample will receive a score, and the results will be triangulated with additional online interviews with AEs conducted as needed, as well as with field observations and additional data/information gathered during country visits. Figure 6 provides the analytical framework for the cluster study with a nested framework within each cluster. The analytical framework under each cluster forms the basis for the rubrics.

Figure 6. Nested analytical framework for cluster study[16]



The cluster case study will serve as a separate knowledge product under this evaluation but will also feed into the main evaluation report with key findings and recommendations.

c. Assessing impacts

The portfolio evaluation involves assessing the evidence of both realized and potential impacts of CIEWS. The GCF's mission is to help developing countries achieve climate impacts, such as reducing greenhouse gas emissions and increasing the resilience and adaptive capacity of communities and countries vulnerable to climate change. Accordingly, assessing the realized and potential impacts across the portfolio of CIEWS projects and programmes is closely linked to evaluating the GCF's *raison d'être* and is one of the fundamental objectives of this evaluation, given the accountability and learning mandate of the IEU.[17]

In the ToC developed for this evaluation, impacts are captured in both the "long-term outcome" and "vision" sections, such as "greater resilience of vulnerable populations and critical infrastructure" and "enabling local communities to adapt to future climate change" (Figure 2). This evaluation will assess progress towards these outcomes and vision by examining evidence of key behavioural and knowledge changes among individuals in targeted communities following CIEWS interventions. It will also assess if and how these interventions have enhanced the adaptive capacity of supported communities. This assessment will be primarily qualitative, drawing on findings from midterm and final evaluations of relevant CIEWS projects and programmes, consultations with stakeholders, and field visits and observations.

In addition, the assessment involves incorporating quantitative evidence generated from the GCF's Learning-Oriented Real-Time Impact Assessment (LORTA) programme. LORTA-supported

[16] See section B.0 for more explanation on cluster 1 (the components of climate services) and cluster 2 (four pillars of early warning systems). For cluster 3 (four steps of comprehensive climate and disaster risk management), see Global Shield against Climate Risks (n.d.).
[17] This dual accountability-learning function is also laid out in the GI and the updated ToR of the IEU in decision B.BM-2021/15, annex I.

evaluations use household survey data collected directly from communities targeted by selected CIEWS interventions. These data will be used to assess progress towards the long-term outcomes and vision articulated in the ToC. However, interpreting the observed changes requires careful consideration of the timing and implementation status of project activities. The evaluation, therefore, examines whether key CIEWS components were operational at the time of data-collection to ensure that any outcome level changes can be linked to the interventions. While the evidence generated from these LORTA evaluations are context-specific and may not fully represent the entire CIEWS portfolio, they can offer valuable insights regarding key outcomes/changes that occurred via CIEWS interventions.

During the inception phase, the following CIEWS-related projects and programmes under the LORTA programme were identified for further review.

Table 5. List of potential CIEWS projects for assessing impacts

No.	FP	Project title	Country	Household survey data availability
1	FP002	Scaling up the use of Modernized Climate information and Early Warning Systems in Malawi	Malawi	Baseline, midline and endline data
2	FP026	Sustainable Landscapes in Eastern Madagascar	Madagascar	Baseline, midline and endline data
3	FP068	Scaling-up Multi-Hazard Early Warning System and the Use of Climate Information in Georgia	Georgia	Baseline data
4	FP069	Enhancing adaptive capacities of coastal communities, especially women, to cope with climate change induced salinity	Bangladesh	Baseline, midline and endline data
5	FP073	Strengthening Climate Resilience of Rural Communities in Northern Rwanda	Rwanda	Baseline and midline data
6	FP087	Building livelihood resilience to climate change in the upper basins of Guatemala's highlands	Guatemala	Baseline and midline data

In addition, a preliminary review of the household survey questionnaires from some of the aforementioned LORTA projects resulted in the classification of available CIEWS-related data and indicators (see Table 6).

Table 6. Sample of available CIEWS-related data from LORTA programme

No.	Category	Indicators
1	Access to and use of climate/weather information	• Percentage of households with access to seasonal temperature forecasts • Percentage of households with access to seasonal rainfall forecasts • Percentage of households with access to short-term rainfall warnings • Percentage of households that received early warnings before disasters • Percentage of households receiving climate information in the past 12 months
2	Adoption of climate	• Percentage of farmer households implementing specific climate

No.	Category	Indicators
	responsive practices	adaptation practices • Percentage of households adopting technologies as adaptation strategies to weather and climate change impacts • Percentage of households adopting new practices to reduce negative consequences related to natural disasters • Percentage of households adopting new practices to avoid problems caused by climate change.

Accordingly, this evaluation aims to leverage the available household survey data and emerging findings from (quasi) experimental studies conducted by the IEU LORTA team to provide more rigorous evidence of impacts for selected CIEWS projects and programmes where possible. This mixed-method approach will help develop a more nuanced understanding of the impacts and benefits attained from CIEWS investments.

d. Gender equality and social inclusion aspects of CIEWS

During the inception phase, the evaluation team reviewed past evaluations undertaken by the IEU to inform the scope of the CIEWS evaluation. The key findings from the review included:

- Limited inclusion of Indigenous, traditional and local knowledge in CIEWS delivery, which is a key element of risk knowledge and a source of essential climate data and information.
- Increased recognition of gender as being crucial towards advancing community-based EWS and the role of women's empowerment towards improving post-disaster recovery.

Considering these emerging findings from the desk review and recognizing that climate impacts often disproportionately affect women and Indigenous communities, the evaluation will aim to explore how CIEWS projects and programmes address gender-specific vulnerabilities and leverage the unique insights and practices of Indigenous Peoples. By examining the extent to which gender equality is promoted and Indigenous knowledge is utilized, the evaluation seeks to identify best practices and areas for improvement. This will involve analysing project documentation, conducting stakeholder interviews, and engaging with communities during country visits to understand the role of gender and Indigenous knowledge in enhancing the effectiveness and inclusivity of CIEWS interventions. Project documentation for review includes APRs, gender assessments, gender action plans, logical frameworks, and AE-led interim and final evaluations among others. The evaluation matrix (Appendix 1) contains the following evaluation questions and sub-questions linked to gender equality and the use of Indigenous knowledge in CIEWS (see Table 7). By examining these aspects, the evaluation will assess whether GCF investments are socially inclusive and equitable in addition to being climate responsive.

Table 7. Evaluation questions linked to gender equality and the use of Indigenous knowledge

Scope	GCF evaluation criteria	Question No.	Evaluation questions and sub-questions
Portfolio	Relevance	3.2	To what extent are CIEWS interventions meeting the needs of communities?
		3.3	To what extent are CIEWS interventions meeting the needs of historically underserved populations such as women, Indigenous Peoples, and disabled persons?
		3.4	How have CIEWS interventions incorporated and leveraged on Indigenous traditional knowledge?
		3.5	To what extent are CIEWS interventions locally led (hence relevant to local contexts)?
	Gender equity	7	To what extent have CIEWS interventions fostered women's participation and leadership? What key factors have driven gender equality results?

4. COUNTRY SELECTION

Country visits planned under phase 2 of the evaluation are considered crucial data-collection and triangulation activities since visits allow the evaluation team to verify preliminary findings from the desk review and address any data gaps identified during the inception phase.

The evaluation team used a three-step process to assemble a purposive sample of CIEWS projects for country visits:

Step 1: Initial long- and short-listing

The team began with the universe of CIEWS-tagged projects identified through the Secretariat's tagging exercise and validated by the IEU. From these, the team started with selecting those with the highest CIEWS-tagging weight while excluding any projects already covered by other IEU evaluations or located in countries with severe travel restrictions.

Step 2: Applying diversity criteria

Following the analytical framework for this evaluation, the following filters were applied:

- Geographic balance: At least one case from each region, including priority regions (SIDS, LDCs, Africa)
- Maturity rate: Projects with medium to high implementation maturity (up to or over 50 per cent in disbursement, expenditure, and reporting)
- Thematic and modality: A mix of single-country and multi-country projects/programmes, public sector and private sector, and various financial instruments
- RPSP/PPF linkage: Countries with current or previous RPSP or PPF with clear connections to CIEWS activities and projects
- Climate hazard context: Countries facing diverse types of climate hazards.
- Accredited entity diversity: A mix of international, regional and DAEs.

Step 3: Final validation

A qualitative review was then carried out by the evaluation team in collaboration with GCF Secretariat experts to validate the shortlist and uncover any additional criteria or blind spots overlooked during the previous filtering steps. Based on this validation, the IEU selected five

countries to be considered as case studies of the GCF's CIEWS portfolio. While the final list of countries to be visited will depend on other parameters such as availability of the host countries and organizations as well as coordination with other missions planned by the GCF and related stakeholders, Table 8 provides the list of five countries selected for the evaluation as at the inception phase.

Table 8. Shortlisted countries

Region	Country (status)	Private sector project	DAE	Single- versus multi-country project	Type of hazard
Asia-Pacific	Bangladesh (LDC)	No	Yes	Single-country	Rapid – cyclones, riverine floods and monsoon-triggered landslides; Slow - salination intrusion
	Timor-Leste (SIDS)	No	No	Single- and multi-country	Rapid – landslides, storms and earthquakes
Eastern Europe, Central Asia and Middle East and North Africa	Uzbekistan	No	No	Single- and multi-country	Slow – droughts, storms and landslides
Latin America and Caribbean	Guatemala	Yes	No	Single- and multi-country	Hurricanes, landslides, and earthquakes
Africa	Nigeria	Yes	No	Multi-country	Slow – seasonal floods, protracted droughts

5. METHODOLOGY

Throughout the evaluation, the team will employ mixed methods (both qualitative and quantitative) to strengthen the findings of the evaluation and its validity. The qualitative methods include (i) literature review including grey literature where relevant, (ii) FGDs and KIIs with GCF stakeholders via online and or in-person meetings, and (iii) qualitative observations through visits made to selected countries to produce the cluster case study.

The quantitative approach includes (i) analyses of existing GCF portfolio data sets, (ii) external data sources such as project information from other climate funds and the OECD DAC database, and Global Observatory platform, and (iii) household survey data sets produced by the IEU LORTA programme where relevant. Any other quantitative data sets and analyses required for this evaluation will be discussed and agreed within the team.

6. ETHICAL CONSIDERATIONS

The team will comply with ethical evaluation standards, including integrity, accountability, and respect, as required under the GCF Evaluation Standards. The evaluation team will communicate transparently and openly with relevant stakeholders regarding aspects of the evaluation, such as findings, procedures, limitations or any changes that may occur during the evaluation. Consistent with the principle of inclusion, all reports produced will be shared with NDAs of the respective countries for factual review and correction. Participation in the evaluation and related data-

collection efforts will be strictly voluntary, with an opportunity to refuse or opt-out at any point. Furthermore, participant anonymity will be maintained for all relevant data-collection methods, including interviews and surveys. Interview notes will be anonymized for analysis and not shared outside the evaluation team. If participants request confidentiality, their names will be omitted from the annexes listing interviewees. Interviewers will not disclose the names of other respondents during interviews, even if they may appear to mutually agree. The evaluation team will not base findings on a single source of evidence, ensuring that sensitive data cannot be traced back to its source through triangulation.

F. WORKPLAN

The evaluation will be organized into four phases: (i) inception, (ii) data-collection and analysis, (iii) drafting, and (iv) final reporting and communication/dissemination. This approach paper highlights the results from the inception phase, during which scoping, desk review, and evaluation tool development were undertaken. Below is a more detailed workplan for each phase, including activities already completed in phase 1.

Phase 1 (inception phase): January – June 2025

The main objective of this phase was for the evaluation team to produce an approach paper containing a literature review, CIEWS ToC, an evaluation matrix, evaluation framework and methodology, and an evaluation workplan, including a list of countries to visit. Accordingly, the evaluation team conducted a desk review of CIEWS-related literature, previous IEU evaluations, GCF Board documents and policies, approved FPs and grant proposals from the RPSP and PPF, APRs, interim and final evaluations submitted by AEs, and other relevant documents, all of which informed the delivery of this approach paper. During this phase, the first batch of KIIs was conducted, primarily with Secretariat staff, to inform the scope of this evaluation. Additionally, the evaluation team piloted a series of AI-based tools to extract, categorize, and analyse large amounts of unstructured FP data, which informed the establishment of a list of CIEWS projects and programmes for this evaluation. Moreover, the team reviewed available household survey questionnaires from the LORTA programme to assess the usability of the survey data for this evaluation. Finally, KII questions and protocols, as well as an assessment tool for the cluster study, were drafted during this phase.

Phase 2 (country visits, data-collection and initial analyses): June – July 2025

In phase 2, the evaluation team will visit five selected countries to gather additional data and information from GCF stakeholders to inform the evaluation findings. During these missions, the team will confirm and validate preliminary findings and address any missing data gaps identified during the inception phase. Upon returning from the country visits, the team will conduct quantitative and qualitative data analyses and triangulate findings from the desk review, analyses, and country visits to answer the evaluation questions. The findings generated from the triangulated analyses should, in turn, inform key storylines and messages, which will be expanded upon in the factual draft report during the subsequent phase.

Phase 3 (in-depth analyses, factual draft and draft cluster case study): August – September 2025

Phase 3 involves conducting in-depth data analyses based on the initial findings from the previous phase. The majority of this phase will be dedicated to report writing, including the preparation of the factual report and a draft cluster case study.

Phase 4 (final reporting and communication/dissemination): October 2025 – January 2026

During the final phase of the evaluation, the evaluation team will deliver the final evaluation report containing recommendations, and the final cluster case study. This phase also involves the communication, dissemination, and uptake of the evaluation findings and recommendations through various channels. These may include webinars, presentations to the GCF Board by the IEU and other stakeholders, evaluation briefs, and organizing side events during the GCF Board meeting. See Appendix 5 for the communication plan.

Table 9. Evaluation workplan

Stage	Board meeting / Activity	Dec-24	Jan-25	Feb-25	B.41 Mar-25	Apr-25	May-25	B.42 Jun-25	Jul-25	Aug-25	Sep-25	B.43 Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	B.44 Mar-26
Stage 1	Inception																
	Desk review																
	Approach paper																
Stage 2	Data-collection																
	Preliminary analyses																
	Country visits																
Stage 3	Analysis																
	Drafting																
	Factual report																
Stage 4	Draft report																
	Final report																
	Communications and socialization																

APPENDICES

Appendix 1. EVALUATION MATRIX

Scope	GCF evaluation criteria	No.	Evaluation questions and sub-questions	Methods	Key data sources and literature	Linkage with CIEWS ToC
Approach	Coherence and complementarity	1	To what extent has the GCF been able to enhance international cooperation to promote and strengthen CIEWS both within countries and at international forums?	Desk review, KII, FGD	External and GCF data and information sources, and published documents	GCF inputs 3
		1.1	To what extent has the GCF collaborated with key/main global CIEWS actors, such as WMO, UNDRR, International Telecommunication Union, IFRC, CREWS, World Bank Global Facility for Disaster Reduction and Recovery (WB-GFDRR) and SOFF, to synergize its support and/or channel finances into CIEWS?	Desk review, benchmarking study, KII and/or FGD with CIEWS actors	External and GCF data sources on CIEWS actors	GCF inputs 3
		1.2	To what extent has the GCF collaborated with climate funds (i.e. Adaptation Fund, CIF, GEF, and FRLD), to promote or strengthen CIEWS within target countries, regionally and globally?	Desk review, benchmarking study, KII and/or FGD with climate funds, United Nations agencies and other stakeholders	External and GCF data sources on CIEWS actors	GCF inputs 3
		1.3	To what extent has the GCF collaborated with international AEs (as implementing/technical agencies) including United Nations agencies (i.e. UNDP, UNEP, WFP and IFAD) and other international stakeholders (e.g. international NGOs, private sector, meteorological agencies, climate research institutions, and technology providers) to promote or strengthen CIEWS within target countries, regionally and globally?	Desk review, benchmarking study; KII and/or FGD with climate funds, United Nations agencies and other stakeholders	External and GCF data sources on CIEWS actors	GCF inputs 3
		1.4	How has the GCF contributed to the generation and sharing of CIEWS knowledge among CIEWS stakeholders?	Desk review, systematic review, KII with GCF stakeholders	GCF data and published documents	GCF input 3

Scope	GCF evaluation criteria	No.	Evaluation questions and sub-questions	Methods	Key data sources and literature	Linkage with CIEWS ToC
		1.5	To what extent and in which way has the GCF contributed to discussions at the UNFCCC COP level on strengthening CIEWS including through the WimExcom?	Desk review, KII and/or FGD with UNFCCC/COP and GCF stakeholders	UNFCCC documents, GCF data and reports to the UNFCCC/COP	GCF inputs 3
		1.6	To what extent have the *pilot GCF-SAP CREWS Scaling-up Framework for early warning* (signed in 2023) and the *Framework for Collaboration between the SOFF and CIF, CREWS initiative, GEF, and GCF* (signed in 2023) demonstrated potential or shown early positive/negative signs for scaling-up or catalysing synergies in CIEWS work?[18]	Desk review, benchmarking study, KII and FGD with framework stakeholders	External and GCF data and information on these frameworks	GCF inputs 3
		1.7	What are the remaining gaps in coherence and complementary efforts among CIEWS actors?	Desk review, benchmarking study, portfolio data analysis and mapping, KII and FGD with CIEWS stakeholders, policy meta-review	GCF and CIEWS stakeholders, funding/investment data (including OECD database and WMO/UNDRR Global Observatory)	GCF inputs 3
	Efficiency	2	To what extent is GCF leveraging its programmatic approaches and funding windows (e.g. RPSP, PPF and PAP versus SAP) to support CIEWS?	Desk review, portfolio analysis, KII and FGD with GCF stakeholders	GCF-funded activities, RPSP, PPF data	GCF inputs 1 and 2
		2.1	To what extent is the GCF leveraging its programmatic approaches, such as DAEs versus IAEs, public versus private sector engagement, single-country versus multi-country programming, and sector-based versus results-area based approaches, to achieve efficiency in	Desk review, portfolio analysis, KII and FGD with GCF stakeholders	GCF portfolio data on FA, GCF stakeholders	GCF inputs 1 and 2

[18] See Systematic Observations Financing Facility (2023a).

Scope	GCF evaluation criteria	No.	Evaluation questions and sub-questions	Methods	Key data sources and literature	Linkage with CIEWS ToC
			attaining CIEWS results?			
		2.2	To what extent does the Readiness Programme – both the previous strategy up to 2023 and the transitional arrangement to the new Readiness Strategy 2024–2027 during 2024–2025 – facilitate the creation of an enabling environment for CIEWS programming?	Desk review, qualitative scenario assessment, KII and FGD with RPSP stakeholders (NDA and delivery partners), and RPSP Readiness Results Management Framework (RRMF) data analysis	Samples of RPSP grant proposals and APRs, and RPSP stakeholders	GCF input 1
		2.3	To what extent does the PPF window facilitate CIEWS programming?	Desk review, KII and FGD with PPF stakeholders (AEs, and roster of technical consultants), and PPF data analysis	Samples of PPF grant proposals and APRs, and PPF stakeholders	GCF input 1
		2.4	To what extent and how is the *pilot GCF-SAP CREWS Scaling-up framework for early warning* helping countries to reduce transaction costs and time to access funding for CIEWS?	Desk review, KII and FGD with SAP-CREWS stakeholders, SAP data analysis	SAP pipeline and portfolio data, SAP stakeholders	GCF input 2
		2.5	To what extent and how does the GCF's new organizational structure along with the "Efficient GCF" initiatives, facilitate efficient support and investment in CIEWS across regions?	KII and FGD with GCF stakeholders	GCF stakeholders	GCF input 1
		2.6	How well are financial and technical resources utilized *vis-à-vis* intended outcomes?	Desk review, portfolio data analysis, KII and FGD with GCF stakeholders	GCF portfolio and financial data, FPs and APRs	GCF inputs 1 and 2
Portfolio	Relevance	3	To what extent do CIEWS interventions align to needs and gaps recognized by governments (i.e. national-NHMS, NDMAs and sub-national governments) within target countries?	KII and FGD with GCF stakeholders in target countries	Country visits, country-level GCF stakeholders	Short- and medium-term outputs 1 and 2
		3.1	To what extent are GCF support and investments in CIEWS aligned with the NDCs and NAPs of	Desk review, external and RPSP data analysis	UNFCCC NDC and NAP registry, NDC tracker, RPSP RRMF	Short- and medium-term

Scope	GCF evaluation criteria	No.	Evaluation questions and sub-questions	Methods	Key data sources and literature	Linkage with CIEWS ToC
			the countries being supported?		data	output 1
		3.2	To what extent are CIEWS interventions meeting the needs of communities?	Desk review, KII and FGD with GCF stakeholders, non-participatory observations in countries	FPs, APRs and GCF stakeholders (AEs and GCF beneficiaries) in countries	Short- and medium-term output 2
		3.3	To what extent are CIEWS interventions meeting the needs of historically underserved populations such as women and Indigenous Peoples, disabled persons)?	Desk review, KII and FGD with GCF stakeholders, non-participatory observations in countries	FPs, APRs, interim and final evaluations, and GCF stakeholders (AEs and GCF beneficiaries) in countries	Short- and medium-term outputs 1 and 2
		3.4	How have CIEWS interventions incorporated and leveraged on Indigenous traditional knowledge?	Desk review, KII and FGD with GCF stakeholders, non-participatory observations in countries	FPs, APRs, IEU-IP evaluation data set, GCF LLCA data set, GCF stakeholders (AEs and GCF beneficiaries) in countries, interim and final AE-led evaluations; previous IEU evaluations[19]	Short- and medium-term outputs 1 and 2
		3.5	To what extent are CIEWS interventions locally led (hence relevant to local contexts)?	Portfolio data analysis, KII and FGD with GCF stakeholders, non-participatory observations in countries	LLCA GCF data set, and GCF stakeholders (AEs and GCF beneficiaries) in mission countries	Short- and medium-term outputs 1 and 2
	Effectiveness	4	To what extent has the CIEWS portfolio been successful or unsuccessful in terms of: • Enhancing or making CIS available to users • Making impact-based multi-hazard EWS available, accessible and responsive	Desk review, cluster/thematic study by analytical framework with scorecards, portfolio data analysis, in-country or online-based KII and FGD with GCF stakeholders, and non-	FPs, APRs, interim and final AE-led evaluations, and GCF stakeholders	Short- and medium-term outputs 1,2 and 3

[19] LLCA = Locally led climate adaptation.

Scope	GCF evaluation criteria	No.	Evaluation questions and sub-questions	Methods	Key data sources and literature	Linkage with CIEWS ToC
			• Improving and leveraging CIEWS for investments?	participatory observations		
		4.1	What are the key factors that have facilitated or hindered the progress or achievements of the CIEWS interventions by cluster type (i.e. notable common emerging successes/good practice and or challenges/lessons per cluster)?	Desk review, cluster/thematic study, portfolio data analysis, in-country or online-based KII and FGD with GCF stakeholders; and non-participatory observations	FPs, APRs, interim and final AE-led evaluations, and GCF stakeholders	Short- and medium-term outputs 2 and 3
		4.2	To what extent have there been effective cross-sectoral planning and decision-making mechanisms at regional, national, sub-national, and local/community settings to address their climate information and disaster preparedness needs and priorities?	Desk review, cluster/thematic study, portfolio data analysis, in-country or online-based KII and FGD with GCF stakeholders, non-participatory observations	FPs, APRs, and GCF stakeholders	Short- and medium-term output 2
		4.3	How effectively is the GCF portfolio of CIEWS interventions addressing the appropriate range of climate hazards and vulnerabilities?	Desk review, portfolio data analysis and mapping (by climate hazards), KII/FGD with GCF stakeholders	FPs, APRs and GCF stakeholders	Short- and medium-term output 2
		4.4	What are the observable CIEWS-related results?	Portfolio data analysis, KII/FDGs, country missions	FP, APR, interim and final AE-led evaluations, and CIEWS results data reported against PMFs and IRMF	Short- and medium-term outputs 2 and 3
	Impact	5	What are the key changes in knowledge and behaviours of individuals within target communities following CIEWS interventions?	Data analysis including impact evaluation, KII and FGD with GCF stakeholders, non-participatory observations in countries	FPs, APRs, interim and final evaluations, baseline, midline and endline household survey data available from IEU LORTA programme, and GCF stakeholders	Long-term outcome 3

Scope	GCF evaluation criteria	No.	Evaluation questions and sub-questions	Methods	Key data sources and literature	Linkage with CIEWS ToC
		5.1	Have CIEWS interventions enhanced the adaptive capacity of the communities they support?	Desk review, data analysis, KII and FGD with GCF stakeholders in countries, non-participatory observations	FP, APR, interim and final evaluations, LORTA reports on CIEWS projects, GCF stakeholders	Long-term outcomes 1 and 3
	Sustainability and country ownership	6	Are the results achieved from GCF-funded CIEWS projects sustainable without reliance on external support?	Desk review, KII and FGD with GCF stakeholders in countries, and non-participatory observations	FP, APRs, interim and final AE-led evaluations, and GCF stakeholders	Long-term outcome 3
		6.1	What mechanisms, such as national funding, local capacity, and institutional arrangements, have enabled or limited, or have the potential to support the continued operation of CIEWS without external assistance?	Desk review, KII and FGD with GCF stakeholders in countries, and non-participatory observations	FP, APR, interim and final AE-led evaluations, and GCF stakeholders	Long-term outcomes 1, 2 and 3
	Gender equity	7	To what extent have CIEWS interventions fostered women's participation and leadership? What key factors have driven gender equality results?	Desk review, KII and FGD with GCF stakeholders, and non-participatory observations	FP, APR, interim and final AE-led evaluations, and GCF stakeholders	Long-term outcome 3
	Replication and scalability	8	Are there indications that the results achieved from GCF-funded CIEWS projects are/or will be scalable or replicated beyond intervention locations and stakeholder groups?	Desk review, KII and FGD with GCF stakeholders in countries, and non-participatory observations	FP, APR, interim and final evaluations, and GCF stakeholders	Long-term outcome 2
	Unexpected results, both positive and negative	9	What are some unexpected positive and negative results observed in CIEWS interventions?	Desk review, cluster/thematic study, KII and FGD with GCF stakeholders, non-participatory observations	FP, APR, interim and final evaluations, and GCF stakeholders	Short- and medium-term outputs and long-term outcomes
		9.1	Are there examples within the GCF portfolio where CIEWS projects have contributed to addressing non-climate-related hazards (e.g. epidemic or conflict)?	Desk review, cluster/thematic study, KII and FGD with GCF stakeholders, non-participatory observations	FP, APR, interim and final AE-led evaluations, and GCF stakeholders	Short- and medium-term outputs and long-term

Scope	GCF evaluation criteria	No.	Evaluation questions and sub-questions	Methods	Key data sources and literature	Linkage with CIEWS ToC
						outcomes
Cross-cutting	Innovativeness	10	Have CIEWS interventions supported by the GCF leveraged on innovative approaches, practices and technologies?	Desk review, KII and FGD with GCF stakeholders in countries, non-participatory observations	FP, APR, interim and final AE-led evaluations, GCF stakeholders	Cross-cutting across GCF inputs and ST/MT outputs
		10.1	To what extent has the GCF de-risked private investments in CIEWS (e.g. the deployment of financial instruments)?	Desk review, KII and FGD with GCF stakeholders (CIEWS and private sector experts)	FP, APR, interim and final AE-led evaluations, GCF stakeholders	GCF inputs 1, 2 and 3
		10.2	Have there been examples of blending the returns from public benefits (availability of climate information, EWS) and private income streams to increase or strengthen CIEWS (e.g. increased revenues from climate-informed financial products)?	Desk review, KII and FGD with GCF stakeholders (CIEWS and private sector experts), non-participatory observations	FP, APR, interim and final AE-led evaluations, GCF stakeholders	Short- and medium-term output 2
		10.3	Have there been advanced technologies (e.g. AI, remote sensing, data analytics) being applied or transferred to target countries to increase efficiency and reduce costs in CIEWS?	Desk review, KII and FGD with GCF stakeholders, non-participatory observations	FP, APR, interim and final AE-led evaluations, and GCF stakeholders	Short- and medium-term outputs 3
		10.4	Have nature-based solutions been applied to promote or strengthen CIEWS?	Desk review, KII and FGD with GCF stakeholders, non-participatory observations	FP, APR, interim and final AE-led evaluations, and GCF stakeholders	Short- and medium-term output 3

Abbreviations: IFAD = International Fund for Agriculture Development; WFP = World Food Programme

Appendix 2. IDENTIFYING CIEWS PROJECTS

To conduct a portfolio evaluation, it is essential to first establish a list of CIEWS projects and programmes that fall under the CIEWS portfolio. The GCF Secretariat has already conducted a comprehensive exercise to classify and tag existing GCF projects and programmes according to the paradigm-shifting pathways outlined in each sectoral guide. This tagging work was technically overseen by sectoral experts in the CIEWS sector, and the methodology applied is described in an internal Secretariat working document titled "How to tag approved portfolios under 10 sectors and allocate sectoral percentages to generate sectoral data analysis".

During the inception phase, the evaluation team conducted a desk review of the CIEWS data created by the Secretariat, along with other available documents, to better understand the usability of the data for this evaluation.

Based on the extensive desk review, the evaluation team decided to use the list of CIEWS projects created by the Secretariat as a basis and modify the list as necessary for the purpose of this evaluation. For instance, if the evaluation team identified a project that appeared to be incorrectly tagged or omitted as CIEWS, these were removed from or added to the Secretariat's list of CIEWS projects and programmes to create an updated list for this evaluation.

Below are the steps taken to establish a list of CIEWS projects and programmes for this evaluation.

- Complementary analysis approach: To complement the Secretariat's CIEWS sectoral tagging methodology and address inherent challenges in identifying cross-cutting CIEWS interventions across multiple results areas, the evaluation team conducted a comprehensive analysis of the entire GCF portfolio using the institutional GPT-4o API. During this process, it was identified that the Secretariat had already undertaken several exercises to identify and tag CIEWS-related projects up to B.34.
- Integration of Secretariat exercises: Through the review of the Secretariat's work, three additional data sets were found related to CIEWS projects: agriculture projects (CIS and Insurance), insurance projects agricultural sector, and data insurance dashboard. A review of these files yielded a potential list of an additional 19 projects that require careful review for CIEWS components.
- Technical implementation for post-B.34 projects: For projects approved after B.34 that were not covered in the Secretariat's tagging exercise, the evaluation team undertook an AI-based analysis focusing specifically on project outputs and outcomes by utilizing the institutional API access to GPT-4o and applying the CIEWS definition developed by the evaluation team (see section D) with a temperature setting of 0 to ensure consistent and deterministic results. This analysis identified a potential additional 23 projects with CIEWS elements, confirmed with human verification.
- Consolidated results: Combining the Secretariat's original identification of 89 projects with the additional 19 projects from their supplementary exercises and the 23 projects identified through our post-B.34 analysis, the evaluation team developed a comprehensive potential list of 131 projects containing all or some CIEWS components. This list will be the basis of portfolio data analyses and a cluster study under this evaluation.

Appendix 3. LIST OF CIEWS PROJECTS FOR THE EVALUATION

No.	Project ID	Project name
1	FP002	Scaling up the use of Modernized Climate information and Early Warning Systems in Malawi
2	FP004	Climate Resilient Infrastructure Mainstreaming (CRIM)
3	FP012	Africa Hydromet Program – Strengthening Climate Resilience in Sub-Saharan Africa: Mali Country Project
4	FP013	Improving the resilience of vulnerable coastal communities to climate change related impacts in Viet Nam
5	FP014	Climate Adaptation and Mitigation Program For the Aral Sea Basin (CAMP4ASB)
6	FP016	Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management
7	FP018	Scaling-up of Glacial Lake Outburst Flood (GLOF) risk reduction in Northern Pakistan
8	FP021	Senegal Integrated Urban Flood Management Project
9	FP023	Climate Resilient Agriculture in three of the Vulnerable Extreme northern crop growing regions (CRAVE)
10	FP024	Enpower to Adapt: Creating Climate Change Resilient Livelihoods through Community-Based Natural Resource Management (CBNRM) in Namibia
11	FP026	Sustainable Landscapes in Eastern Madagascar
12	FP034	Building Resilient Communities, Wetland Ecosystems and Associated Catchments in Uganda
13	FP035	Climate Information Services for Resilient Development Planning in Vanuatu (Van-CIS-RDP)
14	FP037	Integrated Flood Management to Enhance Climate Resilience of the Vaisigano River Catchment in Samoa
15	FP041	Simiyu Climate Resilient Project
16	FP042	Irrigation development and adaptation of irrigated agriculture to climate change in semi-arid Morocco
17	FP045	Ground Water Recharge and Solar Micro Irrigation to Ensure Food Security and Enhance Resilience in Vulnerable Tribal Areas of Odisha
18	FP048	Low Emissions and Climate Resilient Agriculture Risk Sharing Facility
19	FP049	Building the climate resilience of food insecure smallholder farmers through integrated management of climate risk (R4)
20	FP050	Bhutan for life
21	FP053	Enhancing climate change adaptation in the North coast and Nile Delta Regions in Egypt
22	FP056	Scaling up climate resilient water management practices for vulnerable communities in La Mojana
23	FP066	Pacific Resilience Project Phase II for RMI
24	FP067	Building climate resilience of vulnerable and food insecure communities through capacity strengthening and livelihood diversification in mountainous regions of

No.	Project ID	Project name
		Tajikistan
25	FP068	Scaling-up Multi-Hazard Early Warning System and the Use of Climate Information in Georgia
26	FP069	Enhancing adaptive capacities of coastal communities, especially women, to cope with climate change induced salinity
27	FP072	Strengthening climate resilience of agricultural livelihoods in Agro-Ecological Regions I and II in Zambia
28	FP073	Strengthening Climate Resilience of Rural Communities in Northern Rwanda
29	FP074	Africa Hydromet Program – Strengthening Climate Resilience in Sub-Saharan Africa: Burkina Faso Country Project
30	FP075	Institutional Development of the State Agency for Hydrometeorology of Tajikistan
31	FP076	Climate-friendly Agribusiness Value Chains Sector Project
32	FP078	Acumen Resilient Agriculture Fund (ARAF)
33	FP087	Building livelihood resilience to climate change in the upper basins of Guatemala's highlands
34	FP089	Upscaling climate resilience measures in the dry corridor agroecosystems of El Salvador (RECLIMA)
35	FP092	Programme for integrated development and adaptation to climate change in the Niger Basin (PIDACC/NB)
36	FP094	Ensuring climate resilient water supplies in the Comoros Islands
37	FP101	Resilient Rural Belize (Be-Resilient)
38	FP107	Supporting Climate Resilience and Transformational Change in the Agriculture Sector in Bhutan
39	FP108	Transforming the Indus Basin with Climate Resilient Agriculture and Water Management
40	FP109	Safeguarding rural communities and their physical and economic assets from climate induced disasters in Timor-Leste
41	FP112	Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands
42	FP113	TWENDE: Towards Ending Drought Emergencies: Ecosystem Based Adaptation in Kenya's Arid and Semi-Arid Rangelands
43	FP114	Program on Affirmative Finance Action for Women in Africa (AFAWA): Financing Climate Resilient Agricultural Practices in Ghana
44	FP124	Strengthening Climate Resilience of Subsistence Farmers and Agricultural Plantation Communities residing in the vulnerable river basins, watershed areas and downstream of the Knuckles Mountain Range Catchment of Sri Lanka
45	FP125	Strengthening the resilience of smallholder agriculture to climate change-induced water insecurity in the Central Highlands and South-Central Coast regions of Vietnam
46	FP127	Building Climate Resilience of Vulnerable Agricultural Livelihoods in Southern Zimbabwe
47	FP133	Resilience to hurricanes in the building sector in Antigua and Barbuda
48	FP139	Building resilience in the face of climate change within traditional rain-fed agricultural and pastoral systems in Sudan
49	FP141	Improving Adaptive Capacity and Risk Management of Rural communities in

No.	Project ID	Project name
		Mongolia
50	FP145	RELIVE – REsilient LIVElihoods of vulnerable smallholder farmers in the Mayan landscapes and the Dry Corridor of Guatemala
51	FP147	Enhancing Climate Information and Knowledge Services for resilience in 5 island countries of the Pacific Ocean
52	FP157	Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation - "MI COSTA"
53	FP160	Monrovia Metropolitan Climate Resilience Project
54	FP161	Building Regional Resilience through Strengthened Meteorological, Hydrological and Climate Services in the Indian Ocean Commission (IOC) Member Countries
55	FP162	The Africa Integrated Climate Risk Management Programme: Building the resilience of smallholder farmers to climate change impacts in 7 Sahelian Countries of the Great Green Wall (GGW)
56	FP165	Building Climate Resilient Safer Islands in the Maldives
57	FP170	Enhancing climate resilience in Thailand through effective water management and sustainable agriculture
58	FP171	Enhancing Early Warning Systems to build greater resilience to hydro-meteorological hazards in Timor-Leste
59	FP175	Enhancing community resilience and water security in the Upper Athi River Catchment Area, Kenya
60	FP179	Tanzania Agriculture Climate Adaptation Technology Deployment Programme (TACATDP)
61	FP182	Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP)
62	FP183	Inclusive Green Financing Initiative (IGREENFIN I): Greening Agricultural Banks & the Financial Sector to Foster Climate Resilient, Low Emission Smallholder Agriculture in the Great Green Wall (GGW) countries - Phase I
63	FP184	Vanuatu community-based climate resilience project (VCCRP)
64	FP185	Climate Change: The New Evolutionary Challenge for the Galapagos
65	FP192	The R's (Reduce, Reuse and Recycle) for Climate Resilience Wastewater Systems in Barbados (3R-CReWS)
66	FP197	Green Guarantee Company ("GGC")
67	FP199	Public-Social-Private Partnerships for Ecologically-Sound Agriculture and Resilient Livelihood in Northern Tonle Sap Basin (PEARL)
68	FP201	Adapting Philippine Agriculture to Climate Change (APA)
69	FP202	Upscaling Ecosystem Based Climate Resilience of Vulnerable Rural Communities in the Valles Macro-region of the Plurinational State of Bolivia (RECEM-Valles)
70	FP203	Heritage Colombia (HECO): Maximizing the Contributions of Sustainably Managed Landscapes in Colombia for Achievement of Climate Goals
71	FP205	Infrastructure Climate Resilient Fund (ICRF)
72	FP206	Resilient Homestead and Livelihood support to the vulnerable coastal people of Bangladesh (RHL)
73	FP207	Recharge Pakistan: Building Pakistan's resilience to climate change through Ecosystem-based Adaptation (EbA) and Green Infrastructure for integrated flood risk

No.	Project ID	Project name
		management
74	FP212	&Green Fund: Investing in Inclusive Agriculture and Protecting Forests
75	FP214	Thai Rice: Strengthening Climate-Smart Rice Farming
76	FP215	Community Resilience Partnership Program
77	FP216	Scaling up climate resilient flood risk management in Bosnia and Herzegovina
78	FP217	Building Resilience of Vulnerable Communities to Climate Variability in Rwanda's Congo Nile Divide through Forest and Landscape Restoration
79	FP219	Staple Crops Processing Zone (SCPZ): Promoting Sustainable Agricultural Value Chains
80	FP222	Renewable Energy Performance Platform (REPP 2)
81	FP223	Project GAIA ("GAIA")
82	FP225	E-Mobility Program
83	FP227	Increase Resilience to Climate Change of Smallholders Receiving the Services of the Inclusive Agricultural Value Chains Programme (DEFIS +)
84	FP228	Cambodian Climate Financing Facility
85	FP232	Jordan Integrated Landscape Management Initiative (JILMI)
86	FP233	Community-based Agriculture Support Programme 'plus' (CASP+)
87	FP234	Tonga Coastal Resilience
88	FP236	Basin Approach for Livelihood Sustainability through Adaptation Strategies (BALSAS)
89	FP238	Ecosystems-based Adaptation for resilient Watersheds and Communities in Malawi (EbAM)
90	FP239	Building Climate Resilience for Food and Livelihoods in the Horn of Africa (BREFOL)
91	FP240	Collaborative R&DB Programme for Promoting the Innovation of Climate Technopreneurship
92	FP242	Caribbean Net-Zero and Resilient Private Sector
93	FP244	Climate Resilient Health and Well-Being for Rural Communities in southern Malawi (CHWBRC)
94	FP246	Climate Resilient Agriculture in Somalia (Ugbaad)
95	FP247	Local Climate Adaptive Living Facility Plus (LoCAL+) – West Africa (Burkina Faso, Ivory Coast, Mali and Niger)
96	FP249	Strengthening climate Resilience of Vulnerable Agriculture Livelihoods in Iraq (SRVALI)
97	FP250	Achieving emission reduction in the Central Highlands and South-Central Coast of Viet Nam to support National REDD+ Action Programme goals (RECAF)
98	FP252	Acumen Resilient Agriculture Fund II
99	FP255	Transforming Livelihoods through Climate Resilient, Low Carbon, Sustainable Agricultural Value Chains in the Lake Region Economic Bloc, Kenya
100	FP256	Intensification of Agriculture and Agroforestry Techniques (IAAT) for Climate Resilient Food and Nutrition Security: Tombouctou, Gao, Mopti, Koulikoro and Segou regions of Mali

No.	Project ID	Project name
101	FP258	Multi-country Project Advancing Early Warnings for All (EW4All)
102	FP259	Adapting Tuna-Dependent Pacific Island Communities and Economies to Climate Change
103	FP261	Improving Climate Resilience by Increasing Water Security in the Amazon Basin
104	FP262	Green Climate Finance Facility for Fostering Climate-Smart Agriculture in Senegal
105	SAP001	Improving rangeland and ecosystem management practices of smallholder farmers under conditions of climate change in Sesfontein, Fransfontein, and Warmquelle areas of the Republic of Namibia
106	SAP002	Climate services and diversification of climate sensitive livelihoods to empower food insecure and vulnerable communities in the Kyrgyz Republic.
107	SAP003	Enhancing climate resilience of the water sector in Bahrain
108	SAP007	Integrated Climate Risk Management for Food Security and Livelihoods in Zimbabwe focusing on Masvingo and Rushinga Districts
109	SAP008	Extended Community Climate Change Project-Flood (ECCCP-Flood)
110	SAP010	Multi-Hazard Impact-Based Forecasting and Early Warning System for the Philippines
111	SAP011	Climate-resilient food security for women and men smallholders in Mozambique through integrated risk management
112	SAP018	Enhancing Climate Information Systems for Resilient Development in Liberia (Liberia CIS)
113	SAP020	Climate resilient food security for farming households across the Federated States of Micronesia (FSM)
114	SAP022	Enhancing Multi-Hazard Early Warning System to increase resilience of Uzbekistan communities to climate change induced hazards
115	SAP025	Adaptation of agricultural production systems in Coastal Areas of Northwest Guinea-Bissau
116	SAP026	Extended Community Climate Change Project-Drought (ECCCP-Drought)
117	SAP027	Solomon Islands Knowledge-Action-Sustainability for Resilient Villages (SOLKAS) Project
118	SAP028	Women-Adapt: Enhancing the climate change adaptive capacity of smallholder farmer communities in the Poro Region, focusing on vulnerable women and youth
119	SAP030	Strengthening Climate Resilience of the Lao People's Democratic Republic (PDR) Health System
120	SAP033	Enhancing Climate Information Systems for Resilient Development in Sierra Leone
121	SAP034	Akamatutu'anga To Tatou Ora'anga Meitaki (ATOM): Building a healthy and resilient Cook Islands Community – one block at a time
122	SAP036	Sierra Leone Coastal Resilience Project (SLCRP)
123	SAP038	Climate Adaptation, Resilience and Engagement in Local Governments (CARE-LG)
124	SAP039	Integrated climate risk management for strengthened resilience to climate change in Buner and Shangla Districts of Khyber Pakhtunkhwa Province, Pakistan
125	SAP040	Climate Adaptation and Resilience in Thua Thien Hue Province Vietnam (CARe Hue)
126	SAP041	ALBAdapt – Climate Services for a Resilient Albania
127	SAP042	Building climate resilience by linking climate adaptation and social protection through

No.	Project ID	Project name
		decentralised planning in Mozambique (LINK)
128	SAP043	Upscaling “Naatangue” integrated family and village farms for a resilient agriculture in Senegal
129	SAP046	Strengthening Climate Information and Multi-Hazard Early Warning Systems for Increased Resilience in Azerbaijan
130	SAP048	Strengthening the resilience of vulnerable communities within high climatic and disaster risk areas in Togo
131	SAP049	Sustainable Communities for Climate Action in the Yucatán Peninsula (ACCIÓN)

Appendix 4. EVALUATION INCEPTION INTERVIEWS

As part of the inception phase of this evaluation, KIIs were also conducted with staff members of the GCF Secretariat and one partner organization to gather information relevant to developing a sound analytical approach, and to identify data and information gaps to be filled by the CIEWS evaluation. A total of 12 KIIs were conducted in-person and remotely between 20 March to 7 April 2025. Interviewees were purposively selected to capture a wide diversity of perspectives from individuals working across multiple offices, departments, and areas of specialty within the GCF Secretariat. These included:

- Chief Strategy and Impact Officer
- Head of Special Initiatives, Front Office of Chief Strategy and Impact Officer
- Locally led Climate Action Specialist, Front Office of Chief Investment Officer
- Climate Policy Specialist, Office of Governance Affairs
- Strategic Project Planning Specialist, Department of Monitoring and Evaluation
- Project Preparation Facility Specialist
- Senior Readiness Specialist
- Simplified Approval Process Specialist
- Portfolio Management Specialist, Readiness – Department of the Latin America and the Caribbean Region
- Portfolio Management Specialist, Funded Activities – Department of the Latin America and the Caribbean Region
- Portfolio Management Specialist, Funded Activities – Department of the Africa Region
- Senior Programme Officer, CREWS Secretariat World Meteorological Organization

Interviews were designed with the aim of understanding: (i) the perceived relevance, coherence, and complementarity of the GCF CIEWS approach as related to the broader landscape of CIEWS initiative(s); (ii) examples of efficiency and innovativeness in leveraging funding windows through modalities (RPSP, PPF, PAP and SAP) to support CIEWS; (iii) intended impacts and effectiveness of the CIEWS portfolio; (iv) potential additionality and contribution of GCF investments to CIEWS projects/programmes; and (v) perceived challenges and lessons learned from GCF CIEWS support to date.

Interviews were conducted using a pre-established interview protocol and set of questions, which were tailored to capture the specific knowledge and expertise of each interviewee. Each interview lasted between 30-60 minutes, and all interviews were recorded and transcribed verbatim to enable subsequent analysis. KII data and analysis were used as one of several inputs towards refining the ToC, informing the evaluation's analytical approach, and identifying a rationale for case study country selection. The team also discussed the following topics: potential mapping of stakeholders based on the inception phase; the mix of GCF partners (AEs, DAEs, delivery partners); executing entities; United Nations agencies implementing GCF CIEWS projects; United Nations agencies leading CIEWS initiatives; climate finance institutions funding/implementing CIEWS projects; CIEWS experts; and national partners (NDA, governments, beneficiaries, civil society etc.).

Appendix 5. EVALUATION COMMUNIATION PLAN

Background

Paragraph 64(a) of the Evaluation Policy for the GCF, as outlined in annex I of decision B.BM-2021/07, stipulates that "The IEU and the Secretariat will include a dissemination/knowledge management plan for evaluations in their respective work programmes. The Secretariat's knowledge management function will also play a critical role in this space".

Furthermore, paragraph 64 (d) of the Evaluation Policy states that: "… the GCF will promote the sharing of evaluative evidence across GCF partners through different modes of dissemination and communication".

Context and communication objectives

In this context, the IEU has developed this communications plan as its "dissemination/knowledge management plan" for the Independent Evaluation of the GCF's Approach to and Portfolio of Climate Information and Early Warning System Interventions. The strategy outlines the evaluation team's envisioned approach for disseminating the evaluation's findings and learnings, detailing the suggested modes of dissemination and communication, along with an indicative timeline for key dissemination and engagement activities and engagement. Additionally, the plan is designed to raise awareness of the evaluation both during its implementation and after its completion, with a particular focus on promoting and disseminating its findings and recommendations to decision makers and other key stakeholders within the GCF ecosystem.

Target audiences or stakeholders

Key audience group	Target subgroup (if applicable)	Desired change	Key outputs, engagement	Key audience group
GCF Board	All Board Members, including the Co-Chairs, Board Members from LDCs, and those who can be considered as "Champions" for this evaluation	Board Members are aware of the evaluation's key findings and use the evaluation's recommendations to improve the GCF business model and operations, as the GCF's ultimate decision-making body.	IEU webinars, Board side events, bilateral consultations between the IEU management and the Board members, IEU newsletters, social media, COP30 side event(s).	Executive summary, final evaluation report, evaluation briefs in EN/FR/ES/AR, IEU newsletters (including Board-special editions), the "evaluations" section of IEU activities/annual reports.
GCF Secretariat	Particularly the DMEL and CIEWS experts, OGA and regional departments	The Secretariat becomes aware of the evaluation's key findings and recommendations and submits a timely and thoughtful management response to the evaluation. The Secretariat integrates the evaluation learnings in future planning processes.	IEU webinars, Board side events, regular meetings between the IEU Head and the Executive Director, IEU newsletters, news updates on the GCF intranet GreenShift and social media, COP30 side event(s) and engagements.	Executive summary, final evaluation report, evaluation briefs, regular GreenShift updates, IEU newsletters, press release, IEU's video/podcast focusing on the evaluation findings and recommendations.

Key audience group	Target subgroup (if applicable)	Desired change	Key outputs, engagement	Key audience group
GCF partners (AEs, EEs, advisory group, etc.)	GCF's AEs, implementing entities, NDAs and focal points and observers, particularly those who work in or take a special interest in the LDCs, including the advisory group	The AEs' and the observers' understanding of the GCF is improved, and they become aware of the IEU evaluation's key findings and recommendations.	IEU webinars, Board side events, IEU's engagement in external conferences/events hosted by GCF partners, IEU newsletters, social media updates, IEU Learning Talks, COP30 side events. Advisory group engagement in feedback meetings	Executive summary, final evaluation report, evaluation briefs, press release, IEU's video/podcast focusing on content of the evaluation findings and recommendations

Abbreviations: DMEL = Department of Monitoring, Evaluation, and Learning

Communications-related outputs

Output	Key audience	Content/comments	Expected delivery
IEU website	All	Serves as a hub for all public resources generated by the evaluation; updated immediately once new content becomes available.	A designated web page created as early as December 2024, and updated throughout 2025
Approach paper	Board, Secretariat	Approach, questions, messages of the evaluation	9 June 2025
Draft cluster case study	All	A cluster case study report: Bangladesh, Timor-Leste, Uzbekistan, Guatemala, and Nigeria	15 September 2025
Feedback meeting from advisory group	Advisory group	Feedback on factual draft of evaluation report	8 October 2025
Webinars and/or Board side events to present key findings	Board, Secretariat	In these webinars or Board (virtual) side events, the evaluation team will present the evaluation's key findings and answer any questions the attendees may have.	3rd/4th week of November 2025
Feedback meeting from advisory group	Advisory group	Feedback on final evaluation report	
Final evaluation report	All	Contains the evaluation question, in-depth data analyses, conclusions, findings and recommendations	
Executive summary	All	A 10-15-page executive summary of the evaluation report	
Summary document "Evaluation Brief"	All	A 2 or 4-page summary brief that focuses primarily on the evaluation's background, key question, findings and recommendations. This summary brief is designed for busy readers and is a useful tool to disseminate to a wider	

Output	Key audience	Content/comments	Expected delivery
		audience.	
Final cluster case study report	All	Cluster case study report: Bangladesh, Timor-Leste, Uzbekistan, Guatemala, and Nigeria	
Social media	All	Key updates for every product/event related to the assessment evaluation	Throughout the evaluation process
Video (subject to personnel capacity available during the suggested period)	All	A 5-7 minute video summary of the evaluation's key findings and recommendations, which will be uploaded to YouTube and the IEU's website	First quarter of 2026

Opportunities and plans for engaging stakeholders on the evaluation findings and recommendations

A. Webinars on the approach paper | March 2025

   Three webinars were held in March 2025, for different audience groups – the Board and advisors, AEs and NDAs; the Secretariat; and the civil society organizations, public sector organizations and other NGOs to present and elicit initial comments on the approach of the evaluation. The webinar presentation was recorded and published online.

B. 2025 United Nations Climate Change Conference (COP30) | November 2025

C. IEU webinars on emerging findings (for the Board, Secretariat, and CSO/private sector organizations) | November 2025 – January 2026

D. IEU Learning Talks (to present syntheses/emerging findings etc.) | At any appropriate period/time of the year

REFERENCES

Asian Development Bank (2024). Regional: Increasing Investments in Early Warning Systems to Strengthen Climate and Disaster Resilience. Scoping Report (June). Available at https://www.adb.org/sites/default/files/project-documents/57055/57055-001-tacr-en.pdf.

Brunet, Gilbert, and others (2010). Collaboration of the weather and climate communities to advance subseasonal-to-seasonal prediction. *Bulletin of the American Meteorological Society*, vol. 91, issue 10, pp. 1397–1406. Available at https://doi.org/10.1175/2010BAMS3013.1.

Bruno Soares, Marta, and Suraje Dessai (2016). Barriers and enablers to the use of seasonal climate forecasts amongst organisations in Europe. *Climatic Change*, vol. 137, No. 1, pp. 89–103. Available at https://doi.org/10.1007/s10584-016-1671-8.

Climate Risk and Early Warning Systems (2019). *CREWS Governance Document*. November. Available at https://public.wmo.int/sites/default/files/2023-07/CREWS_Governance_Document_Revised_November_2019.pdf.

_____(2025). CREWS today. Available at https://crews-initiative.org/.

Fakhruddin, Bapon (SHM), and others (2021). Creating resilient communities with medium-range hazard warning systems. *Progress in Disaster Science*, vol. 12, 100203. Available at https://doi.org/10.1016/j.pdisas.2021.100203.

Global Shield against Climate Risks (n.d.). Instruments: A toolbox of tailored CDRFI instruments for the Global Shield. Available at https://www.globalshield.org/instruments-offer-financial-tools/#risk-management.

Green Climate Fund (2014a). B.07/04: Initial Results Management Framework of the Fund. May. Available at https://www.greenclimate.fund/decision/b07-04.

_____(2014b). B.08/07: Initial Results Management Framework of the Fund. October. Available at https://www.greenclimate.fund/decision/b08-07.

_____(2015a). *Initial investment framework: activity-specific sub-criteria and indicative assessment factors*. March. Available at https://www.greenclimate.fund/document/initial-investment-framework-activity-specific-sub-criteria-and-indicative-assessment.

_____(2015b). *Monitoring and accountability framework for Accredited Entities*. November. https://www.greenclimate.fund/document/monitoring-and-accountability-framework-accredited-entities.

_____(2017). GCF/B.17/04: Date and venue of the following meeting of the Board. July. Available at https://www.greenclimate.fund/document/gcf-b17-04.

_____(2019). GCF/B.22/08: Readiness and Preparatory Support Programme: Strategy for 2019-2021 and Work Programme 2019. February. Available at https://www.greenclimate.fund/document/gcf-b22-08.

_____(2020a). *Investment framework for GCF-1*. November. Available at https://www.greenclimate.fund/document/investment-framework-gcf-1.

_____(2020b). *Updated Strategic Plan for the Green Climate Fund 2020–2023*. November. Available at https://www.greenclimate.fund/document/updated-strategic-plan-green-climate-fund-2020-2023.

_____(2021a). B.BM-2021/15: Decision of the Board on the amendment to the Evaluation Policy for the GCF: Updated Terms of Reference of the Independent Evaluation Unit. June. Available at https://www.greenclimate.fund/decision/bbm-2021-15.

_____(2021b). B.29/01: Integrated results management framework and results tracking tool. July. Available at https://www.greenclimate.fund/decision/b29-01.

_____(2022a). *Integrated Results Management Framework: Results Handbook*. Available at https://www.greenclimate.fund/document/results-handbook.

_____(2022b). *Principles for demonstrating the impact potential of GCF-supported activities*. July. Available at https://www.greenclimate.fund/document/principles-demonstrating-impact-potential-gcf-supported-activities.

_____(2022c). *Sectoral Guide: Climate Information and Early Warning Systems*.

_____(2023a). *Strategic Plan for the Green Climate Fund 2024–2027*. July. Available at https://www.greenclimate.fund/document/strategic-plan-green-climate-fund-2024-2027.

_____(2023b). *Readiness Strategy 2024-2027*. October. Available at https://www.greenclimate.fund/document/readiness-strategy-2024-2027.

_____(2024a). *CIEWS Strategic Programming Summary*.

_____(2024b). GCF/B.40/14: Independent Evaluation Unit 2025 workplan and budget and update of its three-year rolling objectives. October. Available at https://www.greenclimate.fund/document/gcf-b40-14.

_____(2025a). GCF/B.41/Inf.13: Status of the GCF resources, pipeline and portfolio. Available at https://www.greenclimate.fund/document/gcf-b41-inf13.

_____(2025b). *Strengthening the resilience of vulnerable communities within high climatic and disaster risk areas in Togo*. March. Available at https://www.greenclimate.fund/document/strengthening-resilience-vulnerable-communities-within-high-climatic-and-disaster-risk-0.

_____(n.d-a). Resource mobilisation, GCF-2. Accessed as of May 2025. Available at https://www.greenclimate.fund/about/resource-mobilisation/gcf-2.

_____(n.d-b). Simplified Approval Process. Available at https://www.greenclimate.fund/projects/sap.

Green Climate Fund and Climate Risk and Early Warning Systems (2023). *GCF-SAP CREWS scaling-up Framework for early warning*. June. Available at https://www.greenclimate.fund/document/gcf-sap-crews-scaling-framework-early-warning.

Intergovernmental Panel on Climate Change (2019). *Special Report on the Ocean and Cryosphere in a Changing Climate*. Available at https://www.ipcc.ch/srocc/.

_____(2021). *The Physical Science Basis*. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Available at https://www.ipcc.ch/report/ar6/wg1/.

_____(2022). *Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Available at https://www.ipcc.ch/report/ar6/wg2/.

_____(2023a). Weather and Climate Extreme Events in a Changing Climate. In *Climate Change 2021 – The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. Available at https://doi.org/10.1017/9781009157896.013.

_____(2023b). *Synthesis Report*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.

International Institute for Sustainable Development (2003). second International Conference on Early Warning (EWC-II). Available at https://enb.iisd.org/events/2nd-international-conference-early-warning-ewc-ii.

Intsiful, Joseph, Rob Varley and Paul Watkiss (2022). Sectoral Guide on Climate and Early Warning Systems. Presentation, 2 June. Available at https://www.greenclimate.fund/sites/default/files/event/gcf-ciews-presentation.pdf.

Kempa, L. and others (2021). Financing measures to avert, minimise and address loss and damage: options for the Green Climate Fund. Research paper (January). Frankfurt am Main, Germany: Frankfurt School – UNEP Collaborating Centre for Climate and Sustainable Energy Finance. Available at https://www.fs-unep-centre.org/wp-content/uploads/2021/01/Financing-measures-to-avert-minimise-and-address-LD.pdf.

Organisation for Economic Co-operation and Development (2009). *Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance*. Available at https://doi.org/10.1787/9789264054950-en.

_____(2024). *Infrastructure for a Climate-Resilient Future*. Available at https://doi.org/10.1787/a74a45b0-enand.

Palmer, T.N., and others (2008). Towards seamless prediction: Calibration of climate change projections using seasonal forecasts. *Bulletin of the American Meteorological Society*, vol. 89, issue 4, pp. 459-470. Available at https://doi.org/10.1175/BAMS-89-4-459.

Sultan, Benjamin, and Cynthia Rosenzweig (2021). *Early Warning Systems for Adaptation*. Science for Adaptation Policy Brief 4. Nairobi, Kenya: The World Adaptation Science Programme (WASP) Secretariat, UNEP. Available at https://wasp-adaptation.org/images/Resources/WASP_Science_for_Adaptation_Policy_Brief_No._4.pdf.

Systematic Observations Financing Facility (2023a). Signed Framework for Collaboration for enhancing Systematic Observation. December. Available at https://www.un-soff.org/document/signed-framework-for-collaboration-for-enhancing-systematic-observation/.

_____(2023b). SOFF Brochure. Available at https://un-soff.org/document/soff-brochure/.

_____(2025). Dashboard. Available at https://www.un-soff.org/dashboard/.

Tall, A., and others (2014). *Scaling up climate services for farmers: Mission Possible. Learning from good practice in Africa and South Asia*. CCAFS Report No. 13. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Available at https://hdl.handle.net/10568/42445.

United Nations Economic and Social Commission for Asia and the Pacific (2023). *Compendium of multi-hazard early warning cooperation: Launched at the G20 Disaster Risk Reduction Working Group Side Event: Early Warning Early Action* (30 March 2023). Available at https://www.rimes.int/sites/default/files/news/ESCAP-2023-RP-Compendium-multi-hazard-Compendium.pdf.

United Nations Framework Convention on Climate Change (2023). Glasgow–Sharm el-Sheikh work programme on the global goal on adaptation referred to in decision 7/CMA.3. December. Available at https://unfccc.int/documents/636595.

_____(n.d-a). Adaptation knowledge portal. Available at https://www4.unfccc.int/sites/NWPStaging/pages/home.aspx.

_____(n.d-b). Global goal on adaptation. Available at https://unfccc.int/topics/adaptation-and-resilience/workstreams/gga.

_____(n.d-c). Introduction. Available at https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction.

_____(n.d-d). Pledges to the Fund for Responding to Loss and Damage. Available at https://unfccc.int/topics/climate-finance/funds-entities-bodies/fund-for-responding-to-loss-and-damage/pledges-to-the-fund-for-responding-to-loss-and-damage.

_____(n.d-e). *Second plan of action of the technical expert group on comprehensive risk management (October 2022 to October 2024)*. Available at https://unfccc.int/sites/default/files/resource/TEG-CRM_PoA.pdf.

_____(n.d-f). Warsaw International Mechanism for Loss and Damage Executive Committee. Available at https://unfccc.int/wim-excom#:~:text=the%20Executive%20Committee-,The%20Executive%20Committee%20of%20the%20Warsaw%20International%20Mechanism%20for%20Loss,management;%20displacement;%20action%20and%20support.

United Nations Office for Disaster Risk Reduction (2015). *Sendai Framework for Disaster Risk Reduction 2015–2030*. Available at https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030.

_____(2023). *The Report of the Midterm Review of the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030*. Available at https://www.undrr.org/publication/report-midterm-review-implementation-sendai-framework-disaster-risk-reduction-2015-2030.

_____(n.d-a). A walk through DRR history. Available at https://www.preventionweb.net/hubs/walk-though-history-disaster-risk-reduction. Accessed on 23 May 2025.

_____(n.d-b). Disaster Risk Reduction Terminology. Available at https://www.undrr.org/drr-glossary/terminology.

United Nations Office for Disaster Risk Reduction and World Meteorological Organization (2023). *Global Status of Multi-Hazard Early Warning Systems*. Geneva, Switzerland. Available at https://www.undrr.org/reports/global-status-MHEWS-2023.

_____(2024). *Global Status of Multi-Hazard Early Warning Systems*. Geneva, Switzerland. Available at https://www.undrr.org/reports/global-status-MHEWS-2024.

World Meteorological Organization (2015). *Seamless prediction of the Earth system: From minutes to months. WMO-No. 1156*. Available at https://library.wmo.int/viewer/54696?medianame=wmo_1156_en_#page=1&viewer=picture&o=bookmark&n=0&q=.

_____(2016). *Climate Services for Supporting Climate Change Adaptation: Supplement to the Technical Guidelines for The National Adaptation Plan Process*. Available at https://unfccc.int/sites/default/files/resource/WMO_Climate_Services_for_Supporting_CCA.pdf.

_____(2019). *2019 State of Climate Services: Agriculture and Food Security*. Available at https://wmo.int/publication-series/2019-state-of-climate-services-agriculture-and-food-security.

_____(2020). 2020 State of Climate Services: Risk Information and Early Warning Systems. Available at https://wmo.int/publication-series/2020-state-of-climate-services-risk-information-and-early-warning-systems.

_____(2021). Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970–2019). Available at https://library.wmo.int/index.php?lvl=notice_display&id=21930.

_____(2022). *Early Warnings for All: The UN Global Early Warning Initiative for the Implementation of Climate Adaptation – Executive Action Plan (2023-2027)*. Available at https://www.un.org/en/climatechange/early-warnings-for-all.

_____(2024). *2024 State of Climate Services: Five-year Progress Report (2019–2024)*. Available at https://library.wmo.int/idurl/4/69061.

_____(2025). Current Status of the Implementation of National Frameworks for Climate Services (NFCS). Available at https://gfcs.wmo.int/site/global-framework-climate-services-gfcs/components-of-gfcs/current-status-of-implementation-of-national-frameworks-climate-services-nfcs.

_____(n.d.). *National Framework for Climate Services. Linking climate knowledge with action on the ground*. Available at https://gfcs.wmo.int/sites/default/files/2023-06/NCFS-Factsheet.pdf.

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