

CREWS Project Presentation Note to the Steering Committee		
Project Title	Building Resilient Early Warning and Risk Communication Capacity Through Cell Broadcast Technology in Five Eastern Caribbean Countries (2026–2030)	
Document Reference	CREWS/RProj/21/Caribbean ECTEL	
Geographic coverage	The Commonwealth of Dominica, Grenada, St. Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines	
Timeframe	2026 - 2030	
Total CREWS Contribution	Total CREWS Contribution: US\$ 5,060,000 <i>The Project includes ACP-EU co-financing in the amount of US\$ 440,000, implemented by the World Bank and included within the World Bank subtotal presented in the budget (Attachment 1: Budget Breakdown).</i>	
Lead Implementing Partner	World Bank (CREWS allocation only)	
	a. Execution	US\$ 1,000,000
	b. Fees	US\$ 100,000
	c. Total	US\$ 1,100,000
Additional Implementing Partners	International Telecommunication Union (ITU)	
	a. Execution	US\$ 3,600,000
	b. Fees	US\$ 360,000
	c. Total	US\$ 3,960,000
Main objective(s)	The main objective of this Project is to ensure that people across five Eastern Caribbean small island developing states (SIDS) receive timely, accurate, and accessible hazard alerts, enabling them to take protective action and reduce loss of life and impacts from disasters. To achieve this, the Project will design, deploy, and operationalize a resilient, regionally coordinated Emergency Alert System (EAS) based on cell broadcast technology across the Commonwealth of Dominica, Grenada, Saint Lucia, St. Vincent and the Grenadines, and St. Kitts and Nevis. While the project encompasses significant telecommunications, regulatory, and systems integration elements, its primary purpose extends beyond technological modernization. Its fundamental objective is to establish a resilient, inclusive, and trusted public warning capability, one that ensures every citizen can receive timely, life-saving alerts and clear protective instructions when disaster threatens. As such, the initiative represents a people-centered public safety intervention, enabled by modern communications technology rather than defined by it. The Project aims to ensure that authoritative, timely, and geo-targeted emergency alerts reach all people at risk—residents, visitors, and transient populations—before and during emergencies,	

	enabling them to take appropriate protective action during fast-onset and high-impact hazards. By strengthening last-mile warning dissemination through mobile networks, the Project addresses a critical gap in end-to-end early warning systems in the Caribbean. A core objective is to implement the EAS using a regional, shared-services model, leveraging economies of scale while preserving full national sovereignty over alert issuance, approval, and public communication. The system will support separate national workflows within a harmonized technical platform and will be aligned with the Common Alerting Protocol (CAP) and impact-based warning practices promoted by WMO and CREWS. In parallel, the Project seeks to strengthen the enabling institutional, regulatory, and operational frameworks required for the sustainable use of cell broadcast for public warning. This includes enhancing coordination among alerting authorities, disaster risk management (DRM) agencies, telecommunications regulators, and Mobile Network Operators (MNOs), and supporting harmonized approaches across participating countries. Through these objectives, the Project contributes directly to CREWS's overarching goal of reducing disaster-related mortality and increasing access to early warnings in SIDS, and to Pillar 3 (Warning Dissemination and Communication) of the UN Secretary-General's Early Warnings for All (EW4All) initiative. By establishing a scalable and replicable model, the Project also lays the foundation for future expansion across the wider Caribbean and for replication in other SIDS and Least Developed Countries (LDC). It also directly supports the CREWS Priority 3 on technology and innovation by taking advantage of the extensive reach of mobile networks to reach people at risk. In addition, the project will identify ways in which artificial intelligence (AI), can be applied to address remaining gaps in early warning dissemination and communication to make informed policy decisions and build a resilient and inclusive regional system.														
Project Recipient/ Beneficiary (people and organization s at risk who are the intended beneficiaries of the project at impact level)	The Project targets five Member States of the Organization of Eastern Caribbean States (OECS)—the Commonwealth of Dominica, Grenada, Saint Lucia, St. Vincent and the Grenadines, and St. Kitts and Nevis—all of which fall under the regulatory jurisdiction of the Eastern Caribbean Telecommunications Authority (ECTEL). These countries share similar risk profiles, institutional arrangements, and mobile telecommunications markets, making them well suited for a coordinated, sub-regional approach to emergency alerting. Primary beneficiaries The primary beneficiaries are the entire populations of the five participating countries, estimated at approximately 510,328 people (see Table 1 for disaggregation per country). <i>Table 1: Population of participating countries (UN Department of Economic and Social Affairs, Population Division, World Population Prospects 2024)</i> <table data-bbox="612 1648 1216 1986"> <tr> <th>Country</th><th>Population</th></tr> <tr> <td>Commonwealth of Dominica</td><td>66,205</td></tr> <tr> <td>Grenada</td><td>117,207</td></tr> <tr> <td>Saint Lucia</td><td>180,149</td></tr> <tr> <td>Saint Vincent and the Grenadines</td><td>99,924</td></tr> <tr> <td>St. Kitts and Nevis</td><td>46,843</td></tr> <tr> <td>Total</td><td>510,328</td></tr> </table>	Country	Population	Commonwealth of Dominica	66,205	Grenada	117,207	Saint Lucia	180,149	Saint Vincent and the Grenadines	99,924	St. Kitts and Nevis	46,843	Total	510,328
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All residents with access to compatible mobile devices within the coverage area of participating mobile networks will benefit directly from receiving **timely, authoritative, and geo-targeted emergency alerts** before and during hazardous events. Sex-disaggregated beneficiary estimates will be developed during Project inception and baseline assessment.

Mobile communications are pervasive across the five countries. Mobile-cellular network coverage reaches nearly the entire population, with high levels of 3G and 4G/LTE availability and widespread smartphone ownership. This creates strong readiness for public warning dissemination through mobile networks and allows the Project to achieve **near-universal reach** without requiring prior registration, subscriptions, or the collection of personal data.

In addition to resident populations, the Project will significantly benefit **tourists, business travelers, migrant workers, and other transient or roaming users**, who are often not effectively covered by existing alerting arrangements. In 2024, these five countries collectively received approximately **984,000 international visitors**, highlighting the importance of ensuring that non-resident populations can also receive timely emergency notifications. By leveraging cell broadcast technology, alerts will be delivered to all compatible mobile devices located within affected areas—regardless of nationality, subscription status, or home network—thereby strengthening protection for a highly exposed and economically important population group in tourism-dependent SIDS.

Institutional and organizational beneficiaries

At the institutional level, the Project will directly benefit a range of **national and regional organizations** involved in early warning, DRM, and telecommunications.

National Disaster Management Organizations (NDMOs) will benefit from access to a reliable and geotargeted alert dissemination capability, strengthened coordination with sectoral agencies and MNOs, and standardized procedures for issuing and managing emergency alerts.

National Meteorological and Hydrological Services (NMHSs) will benefit from improved capacity to translate forecasts and impact-based warnings into rapid public alerts, ensuring that critical warning information reaches exposed populations more effectively and consistently.

Sectoral alerting authorities (including health, water, seismic, volcanic, and other specialized agencies) will gain access to a common alerting platform and harmonized procedures that enable them to disseminate authoritative warnings through a trusted national system while operating within clearly defined governance arrangements.

National Telecommunications Regulatory Authorities will benefit from strengthened regulatory frameworks, model legal instruments, technical guidance, and enhanced capacity to oversee and coordinate emergency alerting obligations within the telecommunications sector.

Regional institutions will also derive significant benefits:

- **ECTEL** will strengthen its role in regional regulatory harmonization and coordination of emergency telecommunications services across its Member States.
- **CDEMA** will benefit from improved integration of warning dissemination within regional multi-hazard early warning systems (MHEWS) and enhanced coordination during transboundary emergencies.
- **CMO** will benefit from stronger linkages between forecasting services and public warning dissemination, supporting the effective use of meteorological and climate information.

	• CTU will benefit from the development of a scalable regional model for mobile-based emergency alerting that can inform broader Caribbean policy and future expansion efforts. Through the provision of a shared technical platform, harmonized procedures, training, simulation exercises, and regulatory support, these institutions will enhance their operational capacity to issue, coordinate, approve, disseminate, and manage emergency alerts; strengthen interoperability across sectors and countries; clarify roles and responsibilities; and improve preparedness for both national and regional emergencies. Private-sector beneficiaries and partners MNOs operating in the five participating countries—Digicel and Liberty Caribbean (Flow)—are both key implementation partners and direct beneficiaries of the Project. The establishment of a standardized, regionally coordinated EAS will provide operators with cell broadcast capabilities, harmonized operational procedures, and a common emergency alerting framework across multiple markets, reducing fragmentation while supporting public service obligations and network resilience. MNOs will be actively involved throughout the Project in system design, testing, deployment, training, and operational readiness activities. They will collaborate with regulators and alerting authorities to define technical requirements, procedures, and sustainability arrangements. Where appropriate, the Project will also provide targeted financial support to help operators undertake the investments and network upgrades needed to enable Cell Broadcast services. The rationale for this support is grounded in the nature of Cell Broadcast technology itself: unlike commercial mobile services, CBS generates no revenue for operators and regulatory frameworks strictly prohibit its commercialization, meaning MNOs have no financial incentive to fund its deployment independently. CREWS financing is therefore applied exclusively to investments that enable the public emergency alerting function and that go beyond operators' regular commercial responsibilities — with long-term operational and maintenance costs formalized through regulatory obligations and cost-sharing arrangements to be agreed with participating governments. This collaboration will strengthen operators' technical capacity, improve coordination with public authorities, reduce implementation costs through regional economies of scale, and help accelerate the sustainable deployment of Cell Broadcast services across participating countries. Broader regional and long-term beneficiaries Although the Project is initially implemented in five OECS countries, it is explicitly designed as a demonstration initiative, and the system will be designed to be scalable and capable of future expansion to additional countries and territories beyond the initial implementation. Knowledge products, technical specifications, and regulatory models developed under the Project will support future expansion to other Caribbean countries and inform similar initiatives in other SIDS and LDCs. As such, the Project's benefits extend beyond the initial beneficiaries and contribute to broader regional and global capacity to deliver life-saving early warnings.
Additional Operational Partners (intended)	The successful implementation and long-term sustainability of the Project depends on close collaboration among regional organizations, national alerting authorities, telecommunications regulators, and private-sector operators. These entities constitute the Project's core operational

<i>direct beneficiaries of the project in the form of increased capacity, products and services the project will deliver)</i>	partners and are direct beneficiaries of the enhanced systems, capacities, and coordination mechanisms delivered under the Project. Regional institutions At the regional level, the Project will be implemented in close partnership with key Caribbean organizations that play complementary roles in telecommunications governance, DRM, and early warning coordination. The ECTEL is a central operational partner, given its mandate as the regional telecommunications regulator for OECS Member States. ECTEL will support regulatory alignment. The CTU will support broader regional coordination beyond the OECS, coordination with MNOs, and harmonization of technical and operational standards related to emergency alerting across participating countries. They will also facilitate knowledge sharing, policy dialogue, and alignment with wider Caribbean ICT and digital resilience initiatives. CTU will also play a role in promoting regional uptake and future scaling of the Emergency Alert System. The CDEMA will support the integration of the EAS within regional and national DRM frameworks. CDEMA's role includes facilitating coordination during transboundary or regional-scale hazards, supporting harmonization of alerting practices, and aligning the system with established MHEWS guidance. The CMO, including relevant Regional Specialized Meteorological Centres and national meteorological services, will support consistency in forecasting inputs and alignment with WMO-endorsed impact-based warning practices, ensuring that scientific guidance is effectively translated into public alerts. The Caribbean Institute for Meteorology and Hydrology (CIMH), as the education, training, and applied research arm of the CMO, will provide technical support to strengthen capacity for impact-based forecasting, risk communication, and the effective use of meteorological and hydrological data within the EAS. National alerting authorities and regulators At the national level, the Project will work directly with designated Alerting Authorities in each participating country. These include NDMOs, NMHSs, health authorities, seismic and volcanic monitoring agencies, and other sectoral institutions authorized to issue warnings for specific hazards. NTRCs, in coordination with ECTEL, are key operational partners responsible for enabling and overseeing the regulatory conditions that support the use of cell broadcast for public warning. Through the Project, these institutions will benefit from enhanced technical guidance, model regulatory instruments, and strengthened coordination with DRM authorities. Mobile Network Operators and industry partners MNOs operating in the participating countries—primarily Digicel and Liberty Caribbean (Flow)—are critical operational partners for the deployment and operation of the cell broadcast-based EAS. As owners and operators of the mobile network infrastructure, MNOs will integrate and operate the cell broadcast centers (CBCs) required to disseminate alerts to the public. The Project will support close collaboration between MNOs, regulators, and alerting authorities to define clear roles, operational procedures, and cost-sharing arrangements. This collaborative approach will help ensure reliable system operation, regular testing, and alignment with public interest objectives and spectrum licensing conditions. Industry coordination will be further supported through engagement with the Caribbean Association of National Telecommunication Organizations (CANTO) and the Global System for Mobile Communications Association (GSMA), the global association representing MNOs. These
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	organizations will contribute technical and operational expertise, support awareness-raising, and facilitate regional and international knowledge exchange on public mobile alerting practices. Added value for operational partners Through participation in the Project, operational partners will benefit from: • Strengthened institutional capacity and technical skills. • Clearer governance, regulatory, and operational frameworks for emergency alerting. • Improved coordination across sectors and jurisdictions. • Access to a shared, resilient, and scalable regional alerting platform. Collectively, these partnerships ensure that the EAS is not only technically effective but also institutionally embedded, operationally sustainable, and regionally expandable, maximizing the Project's impact and long-term value.
Initial state of play	a. Vulnerability, exposure to risks, disasters impacts (on people and economy) The Caribbean is among the regions most exposed globally to multi-hazard risks, including tropical cyclones, flooding, storm surges, landslides, droughts, earthquakes, volcanic eruptions, and health-related emergencies. Countries in the region differ in size and institutional capacity but share common structural vulnerabilities arising from small land areas, concentrated populations, coastal settlement patterns, and heavy reliance on climate-sensitive sectors such as tourism, agriculture, transport, and maritime trade. As a result of these conditions, the Caribbean experiences significant and recurrent disaster losses, with average annual impacts exceeding USD 1.6 billion from natural hazard-related events. Exposure to flooding alone increased by approximately 70 percent between 2000 and 2020, reflecting rapid urbanization in flood-prone areas and increasing climate variability. These impacts place sustained pressure on public finances, critical infrastructure, ecosystems, and livelihoods. Climate change is expected to further intensify disaster risks across the region. The IPCC Sixth Assessment Report confirms, with high confidence, that SIDS face increasing climate-related threats, including stronger tropical storms, more intense rainfall events, prolonged droughts, rising temperatures, and sea-level rise. Extreme heat is emerging as a growing public health concern, while changing rainfall patterns threaten water security and food production systems. While scientific and technical capacities for hazard monitoring, forecasting, and impact-based warnings have improved in recent years, risk reduction outcomes depend critically on the ability to disseminate warnings effectively to people at risk. Timely, authoritative, and actionable information allows individuals, communities, and institutions to take protective measures that can significantly reduce loss of life, injury, and economic disruption. In the Caribbean context (characterized by dispersed populations, high mobility, and a large proportion of tourists and temporary residents) last-mile communication remains one of the weakest links in the end-to-end early warning chain. Ensuring that warnings reach all exposed populations rapidly, clearly, and reliably before and during emergencies is

		therefore essential to strengthening resilience, protecting lives, and reducing the escalating impacts of disasters on people and economies.
	b. Status of the EWS, DRM institutions and NHMSs, actors / players present	<i>This section draws on findings from two studies: A Situation Analysis of the Caribbean Multi-Hazard End-to-End Early Warning System and Strengthening Regional Emergency Alert Capacity of the Caribbean Region, both developed by the World Bank in 2021 and 2023 with funding from the Climate Risk and Early Warning Systems (CREWS) initiative.</i> Early warning systems in Caribbean countries are supported by a network of public institutions with mandates related to hazard monitoring, forecasting, and DRM. These typically include NMHSs, NDMOs, ministries responsible for health, agriculture, water resources, and other sectoral agencies. Together, these institutions contribute to different components of end-to-end early warning systems, from risk monitoring and forecasting to preparedness and response. In practice, however, institutional arrangements for warning issuance and dissemination are often fragmented. NMHSs routinely issue hazard advisories and warnings—particularly for hydrometeorological events—using traditional media and online channels. During high-impact events, these warnings commonly trigger the activation of national emergency response mechanisms led by NDMOs. Despite this functional interdependence, coordination between NMHSs and NDMOs is frequently based on informal practices rather than clearly documented mandates, standard operating procedures, or legally defined roles. Broadcast television and radio stations have played a central role in disseminating emergency warnings across the Caribbean and remain key channels for public communication. However, formal agreements and enforceable obligations governing broadcasters’ roles during emergencies are often limited or absent. This creates uncertainty regarding authority to interrupt programming, responsibility for message accuracy, and accountability during crises. At the same time, information ecosystems have evolved rapidly. The expansion of internet access and social media has introduced new communication channels that allow warnings to reach the public quickly but also increase the risk of inconsistent, unofficial, or contradictory messaging. Alerting authorities increasingly rely on international sources—such as regional tsunami or seismic monitoring centers—for hazard information, which may reach the public through informal pathways before national validation or contextualization. Mobile telecommunications networks are now the dominant communication infrastructure for populations across the Caribbean, including in remote and island settings. They have proven particularly critical during disasters, as demonstrated during the 2017 Atlantic hurricane season, when rapid restoration of connectivity became a priority for both operators and governments. Despite this reliance, the integration of mobile networks into formal public warning architectures remains limited. In most countries, mobile-based alerting, where it exists, relies on ad hoc SMS arrangements, rather than standardized, regulated public warning systems. There is currently no consistent regional framework defining the roles,

		responsibilities, or obligations of MNOs in disseminating emergency alerts, nor mechanisms to ensure interoperability, prioritization, or geographic targeting across networks. Examples from individual countries illustrate these structural challenges. In some cases, gaps in legislation and licensing conditions create ambiguity regarding emergency powers and alert dissemination authority. In others, bilateral arrangements with operators exist but lack standardization or fail to address issues such as roaming users and multinational carriers. Overall, most initiatives remain fragmented, small-scale, and insufficient to deliver reliable, last-mile warning coverage at national or regional level. Taken together, the current state of early warning systems in the Caribbean reflects considerable technical capacity in hazard monitoring and forecasting, but systemic weaknesses in institutional coordination, regulatory clarity, and alert dissemination mechanisms. Addressing these gaps (particularly at the interface between alerting authorities, regulators, and MNOs) is essential to strengthening people-centered, end-to-end- early warning systems capable of protecting lives and livelihoods during increasingly frequent and severe hazards.
	c. Projects and programs dealing with EWS and hydromet under implementation or preparation	Over the past decade, Caribbean countries have benefited from a range of regional and national initiatives aimed at strengthening hydro-meteorological services and multi-hazard early warning systems. Collectively, these programs have contributed to significant improvements in hazard monitoring, forecasting, institutional coordination, and the adoption of impact-based warning approaches. However, they have also highlighted persistent gaps—particularly in last-mile warning dissemination—that the present Project is designed to address. Between 2019 and 2023, the Strengthening Hydro-Meteorological and Early Warning Services in the Caribbean (CREWS Caribbean) project, led by the World Bank in partnership with WMO and UNDRR, focused on enhancing regional and national capacities for weather forecasting, hydrological services, impact-based warnings, and service delivery across CARICOM Member States. A key output of this initiative was the development of a regional roadmap for Multi-Hazard Early Warning Systems (MHEWS), which identified the lack of effective, people-centered alert dissemination as a critical remaining bottleneck. As part of this roadmap, CREWS Caribbean supported the preparation of the technical study “Strengthening Regional Emergency Alert Capacity of the Caribbean Region”, which assessed existing alerting practices, benchmarked them against international best practices, and recommended the adoption of geo-located mobile alerting—particularly cell broadcast—as a priority solution for improving last-mile warning delivery. The present Project directly operationalizes these recommendations. Several complementary initiatives have further strengthened the upstream components of early warning systems in the region. The Enhancing Resilience to Reduce Vulnerability (ERC) project improved regional early warning networks and significantly enhanced the computational and modeling capacity of the CIMH, supporting the development of

	high-resolution numerical weather prediction products and regional platforms for impact-based forecasting. National-level investments, including Disaster Vulnerability Reduction Projects (DVRPs) in Saint Lucia, Grenada, and Dominica, as well as larger hydrometeorological projects in Haiti and Jamaica, have strengthened observation networks, forecasting capacity, and institutional arrangements for DRM. These projects have enhanced countries' ability to generate warnings but have not systematically addressed the dissemination of alerts to populations at risk through modern, mass-reach mobile technologies. Other regional and international initiatives—including the Severe Weather Forecasting Demonstration Project (SWFDP-Caribbean), led by WMO, and programs supported by UNDP, IFRC, and DIPECHO—have promoted regional coordination, institutional learning, and the adoption of integrated EWS frameworks. While these efforts have advanced technical cooperation and preparedness, their focus has largely remained on forecasting, coordination, and guidance rather than operational last-mile alert delivery. In Dominica, the DOMCREP initiative — a US\$26 million Green Climate Fund project — is currently expanding the national Multi-Hazard Early Warning System through the installation of automated weather stations and flood sensors in high-risk river basins, including a 2025 upgrade incorporating satellite-linked sirens and SMS-alert capabilities to reach populations in areas with limited cellular coverage. The proposed cell broadcast system is explicitly designed to complement and integrate with such foundational sensing and monitoring infrastructure: the Public Warning System will be capable of disseminating alert messages originating from automated weather stations and flood sensors operated by national alerting authorities, amplifying the reach and impact of existing investments. Several countries in the region have also benefited from app-based CAP alerting solutions, largely supported through previous UNDP programming. NDMOs and Meteorological Offices in participating countries have already developed alert language, protocols, and Standard Operating Procedures (SOPs) through these initiatives. Rather than designing from scratch, the present Project is fully aligned with and complementary to these solutions: the proposed Public Warning System supports third-party CAP alert origination software already in use by national alerting authorities, allowing them to trigger cell broadcast alerts directly from existing CAP-based platforms without replacing current workflows. At the regional level, Barbados and Antigua and Barbuda are designated focus countries of the EW4All initiative and have developed advanced visions for multi-hazard early warning. The Project recognizes and seeks to align with or inform this thinking, ensuring coherence between the proposed cell broadcast system and EW4All country roadmaps in the wider Caribbean. Similarly, the Project has been designed with awareness of the CREWS 2.0 Caribbean regional initiative, and its outcomes are intended to complement rather than duplicate regional efforts under that program. Taken together, these initiatives have laid a strong foundation for effective end-to-end early warning systems in the Caribbean by improving hazard detection, forecasting, and institutional coordination. However, none has delivered a standardized, scalable, and regionally coordinated solution for
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	disseminating authoritative, geo-targeted emergency alerts directly to people at risk via mobile networks. The current Project is therefore a natural and logical next step. It builds directly on existing investments — including GCF-funded infrastructure programs such as DOMCREP, app-based CAP alerting solutions supported by UNDP, and national capacities developed under EW4All — and addresses a clearly identified gap in the early warning value chain. By focusing on the final and most critical component of EWS effectiveness, and by integrating with rather than replacing existing systems and workflows, the Project ensures that timely, trusted warnings reach all exposed populations before and during emergencies.
<i>d. Describe the multiplier /leveraging potential of the CREWS investments</i>	The proposed Project presents strong multiplier and leveraging potential, as it targets a critical and commonly underfunded component of early warning systems: last-mile alert dissemination to people at risk. By focusing CREWS resources on this final link in the early warning value chain, the Project amplifies the impact of substantial prior and ongoing investments in hazard monitoring, forecasting, institutional capacity, and preparedness across the Caribbean. At the institutional level, the Project leverages and reinforces existing regional coordination frameworks. By implementing a shared, sub-regional EAS across five OECS countries, the Project promotes harmonization of technical standards, regulatory approaches, and operational practices, while preserving national sovereignty over alert issuance. This cooperative model strengthens regional institutions (particularly ECTEL, CDEMA, CMO and CTU) and establishes a governance structure that can be extended to additional countries with limited incremental costs. From a technical and financial standpoint, a single, redundant cloud-based cell broadcast platform offers major economies of scale. It builds on existing mobile network infrastructure and broad mobile coverage in the region: 2G and 3G networks reach 97% of the population, 4G reaches 98%, mobile ownership stands at 87%, and 95% of households have at least one mobile phone. The platform will also incorporate AI-enabled capabilities to help close remaining gaps in early warning systems and make alerts more resilient, effective, and inclusive for people at risk. Rather than supporting multiple standalone national systems, CREWS financing enables a cost-effective regional solution that reduces duplication, lowers procurement and operational costs, and improves system resilience through shared redundancy and centralized maintenance. The system architecture is also designed to remain technology-agnostic and future-ready, allowing for the potential piloting and integration of emerging capabilities—such as Direct-to-Device (D2D) satellite connectivity—as these technologies mature and become operationally viable for public warning purposes. Beyond its direct impacts, the Project is expected to catalyze larger investments in digital resilience, emergency communications, and early warning systems across the Caribbean and other regions interested in cell broadcast. By establishing a proven regional model and harmonized

	regulatory framework, it will allow for reduced transaction costs for additional countries to introduce cell broadcast to their alerting SOPs, reduce barriers to future investments in early warning systems in the region, and facilitate the integration of cell broadcast capabilities into existing and future hazard monitoring initiatives, climate adaptation initiatives, and DRM programs. The Project has the potential to help leverage future investments worth hundreds of millions of dollars globally by establishing this proof of concept. The Project also has strong replication and scaling potential beyond the initial pilot countries. The five OECS states account for a relatively small share of the Caribbean population, yet the same technical architecture, regulatory models, and operational procedures can be readily extended across CARICOM Member States. As a demonstration initiative, the Project provides a proven template that can be adopted by other Caribbean SIDS and, with appropriate adaptation, by LDCs facing similar last-mile dissemination challenges. At the global level, the Project directly contributes to Pillar 3 (Warning Dissemination and Communication) of the UN Secretary-General's EW4All initiative, for which the International Telecommunication Union (ITU) serves as lead agency. By operationalizing geo-located mobile alerting through cell broadcast—one of EW4All's priority solutions—the Project generates practical experience, lessons learned, and implementation tools that can inform global replication efforts supported by CREWS and other financing mechanisms. An important multiplier effect also arises from the Project's ability to protect tourists and other transient populations. Cell broadcast alerts reach all compatible mobile devices within an affected area, including roaming users, without prior registration. This significantly expands the protected population in tourism-dependent SIDS, reduces disaster-related risks to visitors, and supports broader economic resilience by safeguarding a critical sector. In contexts where visitor numbers can exceed resident populations during peak seasons, this inclusive alerting capability substantially amplifies the Project's impact. Overall, the CREWS investment catalyzes a high-impact, scalable solution that transforms how early warnings are delivered to people at risk. By closing a longstanding last-mile gap, aligning with global initiatives, leveraging broader investments in digital resilience and climate adaptation, taking advantage of emerging technologies and AI-enabled innovation, and embedding sustainability through regional cooperation, the Project ensures that initial CREWS financing continues to generate benefits well beyond the demonstration phase in both geographic scope and duration.
e. Describe measures to ensure coherence with existing initiatives	Coherence with existing regional and national initiatives is a core design principle of the Project. Rather than operating as a standalone intervention, the Project is deliberately structured to complement, reinforce, and operationalize ongoing investments in digital infrastructure, DRM, and early warning systems across the Eastern Caribbean.

		At the institutional level, coherence is ensured through the central coordinating role of the CTU, which supports regional coordination and the scaling up of the solution, in collaboration with the ECTEL, the regional telecommunications regulator for OECS Member States. ECTEL's established mandate for regulatory harmonization, spectrum management, and quality-of-service oversight, provides a natural anchor for aligning emergency alerting requirements with existing telecommunications frameworks. By embedding emergency alerting considerations within ECTEL-led regulatory processes, the Project avoids fragmentation and promotes long-term sustainability. Programmatically, the Project aligns with the Caribbean Digital Transformation Project (CARDTP), a regional WB-financed initiative supporting digital infrastructure, regulatory reform, and digital resilience in OECS countries. CARDTP includes activities aimed at strengthening network resilience, post-disaster recovery, and emergency communications. The proposed CREWS Project complements these efforts by focusing on a specific, operational use case (public emergency alerting via cell broadcast) that leverages the digital infrastructure, regulatory reforms, and institutional capacity supported through CARDTP. This alignment is reinforced by the shared implementation and coordination role of the World Bank, which enables active cross-project coordination, knowledge transfer, and sequencing of activities. Through the Bank's engagement with ECTEL, national governments, and telecommunications regulators, the Project will ensure that technical design choices, regulatory recommendations, and capacity-building efforts are fully consistent with broader digital development and DRM agendas in the region. Operational coherence is further strengthened through coordination with regional DRM and meteorological institutions, particularly CDEMA and CMO, ensuring consistency with existing MHEWS frameworks and impact-based warning practices. This prevents parallel systems from emerging and supports integration of the EAS into established national and regional workflows. Together, these measures ensure that the Project: • Builds directly on existing investments rather than duplicating them. • Reinforces regional harmonization and institutional ownership. • Embeds the EAS digital resilience and early warning capacity in the Eastern Caribbean.
Project Rationale	a. Who, where and in what ways and to what hazards people and ecosystems are exposed and vulnerable	a. Who, where, and in what ways people and ecosystems are exposed and vulnerable Caribbean SIDS are among the most exposed and vulnerable regions globally to multi-hazard risks, including tropical cyclones, flooding, storm surges, landslides, droughts, earthquakes, volcanic eruptions, and health emergencies. These hazards affect densely populated coastal zones, critical infrastructure, transport corridors, tourism assets, and environmentally sensitive ecosystems that underpin national economies and livelihoods.

Climate change is further amplifying these risks by increasing the intensity of extreme rainfall, storms, heatwaves, and droughts, while also contributing to sea-level rise and coastal erosion. In this context, timely and actionable early warnings are one of the most cost-effective means to reduce loss of life, injuries, and economic disruption. However, the effectiveness of early warning systems ultimately depends on the ability to reach people at risk rapidly, reliably, and clearly, particularly during fast-onset and high-impact events.

Over recent years, Caribbean countries have made important advances in hazard monitoring, forecasting, and impact-based warning services. Nevertheless, a critical gap remains in last-mile warning dissemination, especially the ability to deliver authoritative alerts simultaneously to large numbers of people in specific geographic areas before or during emergencies.

b. Limitations of current warning dissemination approaches

Across the Caribbean, emergency alerts and warnings are disseminated through a combination of traditional media (radio and television), websites, social media platforms, sirens, and mobile messaging. While these channels play an important role, they each present limitations during emergencies, particularly when people are asleep, offline, traveling, or unfamiliar with local communication practices.

Mobile phones are the most pervasive communication devices in the region and therefore represent the strongest channel for last-mile warning dissemination. Indeed, an estimated 98 percent of the population in the ECTEL countries is covered by mobile networks, and 9 out of 10 people own a mobile phone.

Short Message Service (SMS) remains the dominant mobile-based alerting method used by many institutions. However, SMS is not designed for mass, time-critical emergency alerting. Messages are delivered sequentially rather than simultaneously, are highly vulnerable to network congestion during crises, and often arrive with significant delays. SMS-based systems also typically rely on pre-registration of recipients and are not location-aware, meaning alerts may miss tourists and roaming users while reaching people outside the affected area.

These limitations reduce trust in alerts, increase alert fatigue and, most importantly, undermine the life-saving potential of early warning systems, particularly for hazards with very short lead times such as flash floods, earthquakes, or tsunamis.

c. Rationale for a Cell Broadcast-based Emergency Alert System

Cell broadcast is an internationally recognized and widely adopted technology for public emergency alerting through mobile networks. Unlike SMS, cell broadcast enables the simultaneous, near-instantaneous dissemination of alert messages to all compatible mobile devices connected to selected radio cells, without requiring prior registration, subscription data, or personal information.

Cell broadcast messages are:

	• Geo-targeted, reaching only populations exposed to the hazard. • Resilient to network congestion, as they use a dedicated broadcast channel. • Inclusive by design, covering residents, commuters, and visitors alike. • Distinct and recognizable alert tone, using standardized, attention-grabbing sounds that immediately signal urgency • No user action required, as messages are automatically received on compatible devices without the need to download applications, subscribe to services, or maintain updated contact lists. • Privacy-preserving, since cell broadcast does not rely on personal identifiers such as phone numbers or location tracking, avoiding the collection or storage of user data while still enabling targeted alerting. • Authoritative and secure, as messages can only be issued by designated alerting authorities using defined protocols, including CAP. These characteristics make cell broadcast particularly well suited to last-mile delivery of life-saving warnings in SIDS, where population distribution, high tourist presence, limited redundancy in infrastructure, and exposure to fast-onset hazards place a premium on speed, clarity, and reliability. While cell broadcast has been implemented successfully in many regions worldwide, its adoption in the Caribbean has been constrained not by technical feasibility but by institutional, regulatory, and coordination challenges, including unclear mandates, fragmented approaches, and the absence of regionally coordinated solutions. The cost of nationally implemented cell broadcast systems is also a challenge in countries with very small populations, as the per capita cost for a system is relatively high. d. Rationale for a regional, coordinated approach Implementing cell broadcast through a regional, shared-service model across the five OECS pilot countries offers significant advantages over isolated national solutions. A regional approach enables economies of scale in system design, procurement, and operation; promotes interoperability and harmonization across countries; and reduces costs for smaller states with limited technical and financial capacity. At the same time, the proposed architecture fully preserves national sovereignty over alert issuance, allowing each country to operate its own alerting workflows, authorization procedures, and public communication practices within a harmonized technical platform. Regional institutions—particularly ECTEL, CDEMA, CMO and CTU—provide a strong foundation for governance, regulatory alignment, and future expansion to other Caribbean countries. This approach is fully aligned with the CREWS objective of strengthening end-to-end early warning systems and with Pillar 3 (Warning Dissemination and Communication) of the UN Secretary-General’s EW4All initiative, which prioritizes geo-located mobile alerting as a critical enabler of universal protection.
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		e. Strategic value and added benefits By closing a long-standing last-mile communication gap, the Project directly contributes to: • Reducing disaster-related mortality and injury. • Increasing access to timely and actionable warnings for all people at risk, including vulnerable and transient populations. • Improving institutional coordination among disaster management, meteorological, regulatory, and telecommunications actors; and • Enhancing regional resilience and preparedness through shared systems and knowledge. The Project also generates strong replication and scaling potential. Lessons learned, technical models, and regulatory templates developed through the OECS pilot will support broader adoption across CARICOM and other SIDS and LDCs globally, maximizing the return on CREWS investment and reinforcing global progress toward the Early Warnings for All target.
	b. Describe proposed partnerships and approach for stakeholder engagement in design and in implementation	The success of the Project depends on the establishment of strong, structured, and sustained partnerships among all stakeholders involved in the issuance, regulation, dissemination, and use of emergency alerts. The Project adopts a collaborative and phased stakeholder engagement approach, ensuring that key actors are actively involved throughout system design, regulatory enablement, implementation, and early operation. Stakeholder engagement is designed around three guiding principles: • Clear role definition and accountability across institutions. • Co-design and joint decision-making to ensure ownership and operational relevance. • Regional coordination with national sovereignty, enabling harmonization without undermining country-specific mandates. Engagement during system design and readiness During the design phase, the Project builds on the preparatory work supported by the CREWS Accelerated Support Window (ASW), which initiated early engagement with national authorities, regulators, MNOs (MNOs), and regional institutions. This early engagement allowed stakeholders to jointly assess regulatory readiness, agree on system requirements, and validate the feasibility of a regional Cell Broadcast-based Emergency Alert System. The World Bank and ITU will continue to lead structured consultations with stakeholders during the detailed system design stage. These consultations will: • Validate technical architecture and operational assumptions. • Ensure alignment with national alerting mandates and workflows. • Identify regulatory and institutional adaptations required in each country. • Build consensus around governance, cost-sharing, and sustainability arrangements.

	A regional, in-person consultation and validation workshop (June 2026) brought together national alerting authorities, telecommunications regulators, MNOs, and regional organizations to finalize system design choices and implementation arrangements prior to project implementation. Partnerships with alerting authorities At the national level, Alerting Authorities—including NDMOs, NMHSs, and other sectoral agencies—are central partners in both design and implementation. The Project will support these institutions to: • Agree on clear authorization chains and alert issuance responsibilities. • Develop and adopt harmonized Standard Operating Procedures (SOPs). • Align warning practices with CAP and impact-based warning frameworks. • Build the operational capacity required to use the system effectively. Each participating country will designate a national focal point to coordinate alerting authorities, liaise with regulators and MNOs, and ensure adherence to agreed workflows during both routine operations and emergencies. Engagement with MNOs MNOs—primarily Digicel and Liberty Caribbean (Flow)—are engaged as full operational partners from the outset. Their participation is essential for system integration, testing, operation, and long-term sustainability. Notably, one of the two MNOs has already implemented a Cell Broadcast Centre (CBC) to deliver alerts in the Caribbean region, and both operators have invested significant time and collaborative effort in identifying and addressing the regulatory and contractual changes required for Cell Broadcast implementation — demonstrating concrete, pre-existing private-sector commitment to the initiative. The Project will facilitate structured dialogue among MNOs, regulators, and alerting authorities with support from CANTO, GSMA, CTU, and ECTEL, to: • Define technical responsibilities related to Cell Broadcast Centers (CBCs). • Establish operational procedures for testing, activation, and maintenance. • Clarify cost-sharing and operational arrangements. • Ensure that emergency alerting requirements are aligned with licensing and regulatory frameworks. Regional industry organizations such as CANTO and the GSMA will support engagement by providing technical guidance, sharing international best practices, and facilitating coordination among operators. Regional coordination and implementation support
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		At the regional level, ECTEL, CTU, CDEMA, and CMO will play complementary roles in supporting harmonization, coordination, and scalability. Their involvement ensures that the Emergency Alert System is fully embedded within existing telecommunications governance and DRM frameworks. An oversight and coordination mechanism comprising regional institutions, national authorities, regulators, and MNOs will guide implementation, address cross-border issues, and support alignment across participating countries. This mechanism will also provide a platform for resolving implementation challenges and preparing for future system expansion. Continuous engagement during implementation and early operation Stakeholder engagement will continue throughout implementation and early operation through: • Joint system testing and simulation exercises. • Training and capacity-building activities. • Regular coordination meetings. • Feedback mechanisms to capture lessons learned and operational improvements. This continuous engagement approach ensures that the Emergency Alert System is not only technically deployed but also institutionally embedded, operationally trusted, and sustainably managed by participating stakeholders.
Project design	a. Project components and activities, including describing what and how people centered, risk informed and gender responsive approaches will be applied and how people most-at-risk, local actors and organizations will be engaged	This Project builds on analytical and readiness activities supported under the CREWS Accelerated Support Window (ASW), which provided rapid, targeted assistance to assess regulatory readiness, institutional arrangements, and technical options for implementing mobile-based emergency alerting in the five OECS pilot countries. The ASW support laid the groundwork for a scalable solution by validating the feasibility of a regional, multi-stakeholder cell broadcast-based EAS, identifying key governance and cost-sharing considerations, and building early consensus among national authorities, regulators, MNOs, and regional institutions. A World Bank regional report found that gender inequalities—including women’s disproportionate caregiving responsibilities and differential access to health, education, social protection, early warning, evacuation, and shelter services—can increase the disaster vulnerability of women and girls in the Caribbean.¹ The Project will further assess these considerations during implementation and ensure that warning dissemination and communication strategies address the needs of women, men, older persons, persons with disabilities, visitors, and other vulnerable groups. Following this preparatory phase and the CREWS-financed study “<i>Strengthening Regional Emergency Alert Capacity of the Caribbean Region</i>”, the present Project represents the implementation phase for delivering a fully operational EAS. It addresses a critical last-mile gap in Caribbean early warning systems by enabling the rapid, geo-targeted dissemination of

¹ World Bank (2021), [Gender-Responsive Disaster Preparedness and Recovery in the Caribbean: Desk Review](#).

		authoritative, impact-based alerts to populations at risk through mobile networks, particularly during fast-onset and high-impact hazards. The Project is expected to improve access to early warning services for approximately 510,328 residents across the five participating countries, in addition to tourists, business travelers, migrant workers, and other roaming mobile users within participating mobile networks. The system is designed to be hazard agnostic, meaning that it can disseminate any message that a nationally identified alerting authority will feed into it. This means that it will be able to disseminate warnings for multiple hazards that pose significant risks to life and economic activity in the Eastern Caribbean, including tropical cyclones, flooding, storm surge, landslides, tsunamis, earthquakes, volcanic eruptions, droughts, extreme heat, and public health emergencies. However, beyond supporting establishment of alerting authorities that have the authority to produce messages about specific hazards, this project will not engage in the gathering and monitoring of hazard specific data and forecasts, or support in the improvement of systems that feed hazard data to decision makers. The Project adopts a regional, shared-services approach, leveraging economies of scale while preserving national authority over alert issuance. A single, cloud-based EAS platform will support separate national workflows, comply with the CAP, and ensure high availability, resilience, and interoperability across countries and mobile networks. People-centered, risk-informed, and gender-responsive principles are embedded throughout Project design and implementation, consistent with the Project's Theory of Change and the CREWS MEAL Framework. These include inclusive alert dissemination without pre-registration, geographically targeted warnings to reduce alert fatigue, tailored public awareness activities, and attention to how different population groups—including women, older persons, persons with disabilities, visitors, and other vulnerable groups—perceive, access, understand, and act upon emergency warnings. The Project will monitor these aspects through indicators related to gender-responsive outreach, inclusive communication, and access to early warning information. Private-sector engagement, particularly that of MNOs, is also a core component of the Project, supporting the deployment, operation, sustainability, and continuous improvement of the EAS. Project Outcomes and Outputs Consistent with Project's Theory of Change (Attachment 4), the design recognizes that the effectiveness of MHEWS depends not only on the availability of warning technologies but also on the ability of different population groups to receive, understand, and act upon messages. A review of disaster risk and social vulnerability patterns in the Eastern Caribbean finds women and girls face specific challenges related to caregiving responsibilities, access to information, and disaster response and recovery processes. Accordingly, the Project will adopt a people-centered and gender-responsive approach, ensuring that warning dissemination, public awareness activities, and communication strategies are designed to reach and address the needs of women, men, older persons, persons with disabilities, visitors, and other vulnerable groups. Progress will be monitored
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		through indicators aligned with the CREWS MEAL framework and reflected in the Project Results Framework. Each Outcome is supported by a focused set of Outputs that map directly to the Logical Framework at impact, outcome, and output levels, facilitating clear monitoring, evaluation, and reporting throughout Project implementation. Outcome 1: A Regional Cell Broadcast EAS designed, deployed, and operational This Outcome aims to improve the accessibility, timeliness, reliability, and effectiveness of warning dissemination services across the five participating countries through the deployment and operation of a shared regional cell broadcast EAS. The system will enable the rapid dissemination of CAP-compliant emergency warnings for multiple hazards and support consistent warning delivery across participating mobile networks and countries. Output 1: Regional EAS deployed and operational A shared, cloud-based Regional EAS will be deployed, integrated with participating MNOs, tested, commissioned, and made operational across all five participating countries. The system will provide secure, resilient, and CAP-compliant warning dissemination capabilities while maintaining separate national alerting workflows and sovereign control over alert issuance. Outcome 2: National legal, regulatory and institutional frameworks for emergency alerting strengthened and operational This Outcome ensures that the technical system is supported by a clear, harmonized, and enforceable enabling environment, allowing Cell Broadcast alerting to operate lawfully, reliably, and sustainably. It addresses gaps in legislation, regulation, and institutional mandates that currently constrain the use of advanced mobile alerting technologies in the region. The Project will also support participating countries in reviewing, updating, and maintaining information relating to designated Alerting Authorities, including updates to the WMO Register of Alerting Authorities where appropriate. Output 2: National legal, regulatory and institutional frameworks for emergency alerting strengthened and operational In collaboration with the NTRCs and the ECTEL, the Project will support the development, adaptation, or updating of model legal and regulatory instruments. These will clarify authorization for public warning issuance, define obligations of MNOs, and support regional harmonization through licensing conditions, regulatory directives, or policy instruments, while remaining consistent with national legal frameworks. Where appropriate, the Project will also support participating countries in reviewing and updating information related to designated alerting authorities, including facilitating registration and updates to the WMO Register of Alerting Authorities.
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		Outcome 3: Early warning programs are people-centred, gender-responsive and supported by public-private partnerships. This Outcome focuses on ensuring that warning dissemination services are effectively used and trusted by institutions and the public. It promotes people-centred and gender-responsive approaches, strengthens operational capacity, and supports sustained engagement of MNOs and other stakeholders necessary for the effective operation of the EAS Output 3.1: Standard Operating Procedures (SOPs) for warning generation, approval, dissemination, testing and maintenance developed and operational Harmonized SOPs will be developed for national and regional alerting workflows, covering alert authorization, message creation, approval, dissemination via Cell Broadcast, coordination among alerting authorities and MNOs, and procedures for testing and activation. SOPs will align with CDEMA's regional MHEWS guidance while respecting national institutional arrangements. Output 3.2: Institutional capacity strengthened through training, exercises and operational readiness activities Structured training programs, simulations, and exercises will be delivered for authorized EAS users at regional, national, and local levels, including NDMOs, NMHSs, sectoral agencies, regulators, and MNOs. These activities will strengthen operational readiness, clarify roles and responsibilities, and reinforce coordination during both routine and high-impact emergency situations. Output 3.3: Public awareness and outreach activities implemented National public awareness campaigns will be implemented in each participating country to inform residents, visitors, and transient populations about Cell Broadcast alerts, their meaning, and appropriate protective actions. Campaigns will consider language needs, accessibility, and vulnerable groups, supporting inclusive access and reducing confusion or alert fatigue during emergencies. Campaigns will be designed to address gender-specific needs, including tailored messaging for women, caregivers, elderly persons, and other vulnerable groups, and will promote inclusive access and understanding of alerts. Delivery will be supported through partnerships with National Disaster Management Organizations (NDMOs), National Meteorological and Hydrological Services (NMHSs), telecommunications regulators, MNOs, local media organizations, tourism authorities, community-based organizations, civil society groups, schools, and other relevant national stakeholders. Communication activities will combine traditional media, digital channels, community outreach, public demonstrations, and emergency preparedness events to ensure broad awareness and understanding among both resident and transient populations. Outcome 4: Knowledge and lessons learned generated to support replication and scaling in the Caribbean and other SIDS This Outcome captures and disseminates lessons learned, good practices, and practical tools generated through the Project, enabling replication and
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		scaling of Cell Broadcast-based emergency alerting in other Caribbean countries, as well as in SIDS and LDCs globally. It reinforces the Project's contribution to the EW4All initiative and CREWS's global objectives. Output 4.1: Technical studies, knowledge products and implementation guidance developed Technical specifications, regulatory and institutional model documents, implementation guidance, and synthesized lessons learned will be developed to support future Cell Broadcast EAS implementations. This will also include a study into additional last mile communication channels that could help the region complement the Cell-Broadcast system (such as Direct-to-Device). These products will be designed for practical use by governments, regulators, and development partners. Output 4.2: Regional and global knowledge exchange facilitated A regional exchange event and targeted dissemination activities will be organized in collaboration with CDEMA, CTU, ECTEL, ITU, GSMA, the World Bank, the European Union, and other regional partners. These activities will promote peer learning, regional alignment, and knowledge sharing on geolocated mobile early warning services using Cell Broadcast technology. Beyond the Caribbean, the Project will contribute to global learning through existing CREWS and EW4All knowledge-sharing platforms, as well as through ITU, World Bank, and GSMA networks and events. Technical lessons, implementation guidance, regulatory models, and operational experiences generated by the Project will be documented and shared with other SIDS and LDCs considering similar approaches. This will position the Project as a demonstration initiative whose results can inform future investments in public warning systems, digital resilience, and emergency communications beyond the initial participating countries.
	b. Work plan	This Project will be implemented in 4-year timeframe. Details on Project's work plan can be found in <i>Attachment 2: Workplan/Timeline for implementation</i>

Organization and operating procedures	a. Institutional framework (Describe the planned project management set up and how all the organisations involved in implementing the project will work together. Give a brief description of each partner/actors key roles by component)	The Project will be implemented through a regionally coordinated, multi-stakeholder institutional framework that brings together regional organizations, national authorities, telecommunications regulators, and the private sector to design, deploy, and operate a regional cell broadcast-based EAS. The institutional arrangement is designed to balance regional harmonization and efficiency with full national sovereignty and accountability for public warning issuance. The framework builds on existing regional institutions and coordination mechanisms, ensuring that the Project is embedded within established governance structures and capable of supporting long-term operation and future expansion. Regional-level coordination and project management At the regional level, the World Bank, with technical support from the International Telecommunication Union (ITU),
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		will provide overall project management, fiduciary oversight, and implementation support, in line with CREWS requirements. The World Bank will be responsible for coordinating activities across partners, ensuring coherence with related operations, and reporting on results through the CREWS Monitoring, Evaluation, Accountability and Learning (MEAL) framework. The ECTEL will play a central role as the regional telecommunications regulator for OECS Member States. ECTEL will support regulatory harmonization, and facilitate alignment of licensing conditions, service obligations, and technical standards related to emergency alerting. Through its existing mandate, ECTEL provides a stable institutional anchor for the long-term governance of the EAS. CDEMA will serve as the lead regional coordination body for DRM and early warning integration. CDEMA will support alignment of the EAS with regional MHEWS frameworks, promote harmonization of alerting practices, and facilitate coordination during transboundary or regional-scale emergencies. The CTU, in collaboration with GSMA and CANTO, will coordinate engagement with MNOs, support broader regional policy coordination and knowledge sharing beyond the OECS, linking the Project to wider Caribbean ICT, digital resilience, and emergency communications initiatives. CTU's involvement will help position the EAS for future expansion across CARICOM Member States. The CMO will support consistency with regional and international meteorological standards and impact-based warning practices, ensuring effective integration of scientific warning inputs into national alerting workflows. National-level implementation and responsibilities At the national level, each participating country retains full authority and responsibility for the issuance of emergency alerts within its territory. The institutional framework clearly delineates roles among national actors: • NDMOs are responsible for coordinating national alerting processes, approving public warnings, and ensuring alignment with national emergency response protocols. • NMHSs and other sectoral agencies act as authorized alert originators for specific hazards, providing scientific inputs and impact-based advisories. • NTRCs, working in coordination with ECTEL, oversee regulatory compliance, operator obligations, and public-interest safeguards related to emergency alert dissemination. Each country will designate a national focal point responsible for coordinating among alerting authorities, regulators, and	
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		MNOs liaising with regional partners; and ensuring adherence to agreed SOPs. Private-sector operational roles MNOs—Digicel and Liberty Caribbean (Flow)—are key operational partners within the institutional framework. As owners and operators of the mobile network infrastructure, they are responsible for integrating, operating, and maintaining the CBCs required to disseminate alerts to the public. Their participation will be formalized through: • Regulatory requirements and licensing conditions. • Operational and service-level agreements with alerting authorities. • Agreed procedures for testing, activation, maintenance, and performance monitoring. This structured approach ensures that emergency alerting responsibilities are clearly defined, enforceable, and sustainable over time. Oversight, coordination, and sustainability An oversight and coordination mechanism, comprising representatives from regional institutions, national authorities, regulators, and MNOs, will guide Project implementation and early operation. This mechanism will: • Oversee implementation progress and resolve cross-border or cross-sector issues. • Support alignment of technical, regulatory, and operational arrangements. • Provide a platform for continuous learning and system improvement. By embedding the EAS within existing regional and national institutions and clearly defining roles and responsibilities, the institutional framework ensures that the system is operationally effective, institutionally owned, and financially and regulatory sustainable beyond the life of the Project.	
	b. Monitoring and evaluation system (ensure sufficient resources for monitoring and evaluation)	The Project will implement the CREWS MEAL system fully aligned with the Project’s Results Framework and Logical Framework. The MEAL system is an integral part of Project implementation and will be used to track progress, ensure accountability for results, support adaptive management, and facilitate learning at national, regional, and global levels. Monitoring and reporting arrangements Monitoring of Project implementation and performance will be coordinated by the World Bank, in collaboration with ITU and key regional and national partners. Progress will be reviewed on a regular and systematic basis, with a focus on delivery of	

	Outputs, achievement of Outcomes, and identification of implementation challenges and risks. Formal implementation reviews will be conducted at least annually and will assess: • Progress against planned activities, milestones, and budgets. • Achievement of Outputs and Outcomes as defined in the Logical Framework. • Emerging operational, institutional, or regulatory challenges. • Effectiveness of risk mitigation measures. Annual progress reports will be prepared and submitted to the CREWS Secretariat in accordance with CREWS reporting requirements. These reports will synthesize implementation status, results achieved, key performance indicators, lessons learned, and any corrective actions proposed or undertaken. A mid-term evaluation will be conducted to assess progress toward outcomes, identify implementation challenges, and inform adaptive management. The evaluation will be budgeted at approximately US\$ 50,000 and carried out in line with CREWS MEAL requirements. Results measurement and key indicators In line with the CREWS Results Framework, the Project's primary impact-level indicator is: Number of people living in SIDS with access to, and receiving, forecasts and early warning services developed or improved through CREWS support. For this Project, the target population is approximately 510,328 people living in the five participating OECS countries, comprising 66,205 people in the Commonwealth of Dominica, 117,207 in Grenada, 180,149 in Saint Lucia, 99,924 in Saint Vincent and the Grenadines, and 46,843 in St. Kitts and Nevis. In addition, the Project is expected to benefit visiting tourists, business travelers, migrant workers, and other roaming mobile users within the coverage areas of participating mobile networks. Outcome- and output-level indicators will track, inter alia: • Operational status of the regional Cell Broadcast-based EAS. • Establishment and adoption of enabling regulatory and legal frameworks. • Development and application of harmonized Standard Operating Procedures. • Institutional capacity building and training delivery. • Implementation of public awareness and outreach campaigns. Data sources will include Project implementation reports, system acceptance and testing records, official regulatory
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		documents, training and campaign reports, and confirmations from participating institutions. Accountability and learning The MEAL system places strong emphasis on learning and continuous improvement, particularly given the innovative and regionally coordinated nature of the Emergency Alert System. Feedback from system testing, simulation exercises, training activities, and early operational use will be systematically captured and used to refine technical configurations, operational procedures, and capacity-building approaches. An explicit learning focus will ensure that lessons from both successes and challenges are documented and incorporated into Project implementation, as well as into the knowledge products and guidance materials developed under the Project's replication and scaling component. Alignment with Early Warnings for All monitoring The Project is aligned with the EW4All monitoring framework. At the global level, EW4All monitoring and evaluation is supported by a dedicated Working Group, co-led by UNDRR and WMO, which promotes consistency with UN results-based management principles and harmonized reporting across the four EW4All pillars. Results generated through this Project will be: • Reported through the CREWS MEAL system. • Used, where relevant, to inform EW4All global monitoring, learning, and progress tracking under Pillar 3 (Warning Dissemination and Communication). This alignment ensures that Project results contribute not only to CREWS reporting and accountability but also to broader global learning and scaling of effective early warning dissemination solutions. • Reported and tracked within the EW4All results framework. • Reviewed and assessed as part of periodic EW4All monitoring and evaluation processes. This alignment ensures that Project results contribute directly to CREWS outcome-level reporting while also informing global EW4All progress tracking, learning, and scaling.	
Project viability and sustainability	a. Main identified risks	The Project has identified a limited number of key risks that could affect implementation or long-term sustainability. These risks are considered moderate and manageable, and appropriate mitigation measures have been integrated into Project design, governance arrangements, and stakeholder engagement strategies. Risk 1: Insufficient coordination or sustained commitment among key stakeholders <i>(Moderate risk)</i>	

		The successful deployment and operation of a regional EAS requires active and sustained collaboration among multiple stakeholders, including national alerting authorities, telecommunications regulators, MNOs, and regional institutions. There is a risk that competing priorities, institutional capacity constraints, or changes in leadership could affect coordination or delay decision-making during implementation. Mitigation measures: This risk is mitigated through a structured, inclusive governance and engagement framework. Stakeholders have been involved from the outset through the Accelerated Support Window (ASW) and design phases, fostering early ownership and consensus. Clear roles and responsibilities are defined through agreed institutional arrangements, Standard Operating Procedures, and regulatory instruments. Regional coordination mechanisms—anchored in ECTEL, CDEMA, CMO and CTU—provide continuity beyond individual institutions and support sustained collaboration throughout implementation and early operation. Risk 2: Implementation delays due to natural hazards and disasters or emergency response demands <i>(Moderate risk)</i> Caribbean countries are highly exposed to natural hazards, and major disaster events may require national institutions and MNOs to prioritize emergency response and recovery activities. Such events could temporarily delay planned Project activities, particularly training, consultations, or system deployment steps. Mitigation measures: The Project implementation schedule incorporates flexibility to accommodate emergency response priorities. Activities can be sequenced as needed without compromising overall objectives. Moreover, hazard events may create real-world opportunities for operational learning, system testing, and validation of early warning procedures, which can inform adaptive implementation and strengthen system preparedness. Risk 3: Uncertainty regarding long-term financing for system operation and maintenance <i>(Moderate risk)</i> Following the completion of CREWS financing, participating countries may face challenges in securing sustained resources for operation, maintenance, and future upgrades of the Emergency Alert System, particularly given fiscal constraints common to Small Island Developing States. Mitigation measures:	
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		The Project places strong emphasis on sustainability from the outset. Regulatory and legal frameworks will be strengthened to clarify long-term responsibilities and obligations, including those of MNOs. The regional, shared-services model reduces operational costs through economies of scale, while clearly defined operational procedures and cost-sharing arrangements support national budget planning. High-level policy dialogue and evidence from the Project's demonstrated benefits will further support domestic resource mobilization. Overall risk assessment Taken together, the identified risks are considered manageable and do not threaten the achievement of Project objectives. The combination of strong regional institutions, clear governance arrangements, early stakeholder engagement, and a phased, flexible implementation approach provides a robust foundation for addressing uncertainties and ensuring successful delivery and sustainability of the Project.	
	b. Critical assumptions	The achievement of the Project's objectives and the sustainability of its results depend on a set of critical assumptions related to institutional commitment, stakeholder collaboration, and the broader enabling environment. These assumptions are considered realistic given the preparatory work completed, the existing institutional landscape, and the strong alignment with national and regional priorities. Assumption 1: Continued institutional commitment to regional coordination and harmonization It is assumed that participating countries and regional institutions will continue to support a regionally coordinated approach to emergency alerting, recognizing the efficiency and sustainability benefits of shared systems and harmonized standards. This includes sustained engagement with regional bodies such as ECTEL, CDEMA, CTU, and CMO, and willingness to align national practices within a common technical and operational framework. The Project's design—grounded in existing regional mandates and coordination mechanisms—supports this assumption by reinforcing, rather than replacing, established institutional roles. Assumption 2: Active and sustained engagement of MNOs The Project assumes that MNOs operating in the participating countries—primarily Digicel and Liberty Caribbean (Flow)—will remain willing to collaborate with public authorities to integrate, operate, and maintain cell Bbroadcast emergency alerting capabilities within their networks. This assumption is underpinned by early engagement during the ASW and design phases, recognition by operators of their public service role during emergencies, and the Project's emphasis on clear regulatory frameworks, operational	

		procedures, and cost-sharing arrangements that reduce uncertainty and operational risk for the private sector. Assumption 3: Political and regulatory support for emergency alerting as a public good It is assumed that national governments and telecommunications regulators will maintain political and policy support for treating emergency alerting as a public interest service, enabling the adoption or adaptation of regulatory and legal instruments required to support Cell Broadcast operation. Given the increasing frequency and severity of disasters, and the strong alignment of the Project with national DRM, climate resilience, and digital transformation agendas, this assumption is considered robust. Assumption 4: Institutional capacity remains sufficient to absorb and sustain Project outputs The Project assumes that national alerting authorities, regulators, and regional institutions will retain sufficient institutional capacity to absorb new systems, procedures, and responsibilities introduced under the Project. While capacity constraints are recognized, the Project mitigates this assumption through targeted training, simplified and harmonized workflows, and reliance on a shared regional platform that reduces operational burden at national level. Overall assessment of assumptions The identified assumptions are appropriate and reasonable for a project of this nature and scale. They are reinforced by the Project's phased approach, strong preparatory work, institutional anchoring, and extensive stakeholder engagement. None of the assumptions represent external dependencies beyond the reasonable influence of Project partners, and all are supported by design features intended to maximize resilience, ownership, and sustainability.	
	c. Judgment on the project sustainability	The Project is assessed to have strong prospects for long-term sustainability, based on a combination of institutional anchoring, regulatory enablement, cost-effective system design, and sustained stakeholder ownership. Sustainability has been explicitly integrated into the Project from the outset, rather than treated as a post-implementation consideration. Institutional and governance sustainability The EAS is embedded within existing and well-established regional and national institutions, rather than relying on standalone project structures. The involvement of ECTEL, CDEMA, CTU, and CMO ensures that the system is anchored within permanent regional mandates for telecommunications regulation, DRM, and meteorological coordination. At the	

		national level, clear roles for NDMOs, NMHSs, regulators, and MNOs support continuity beyond the life of the Project. By preserving full national sovereignty over alert issuance, while delivering the system through a harmonized regional platform, the Project reinforces institutional ownership and accountability—key prerequisites for sustainability. The responsibility for hosting and governing the shared platform has not been pre-determined; it is intentionally designed to be defined during project implementation through structured dialogue and coordination with the five participating governments and relevant stakeholders. During preparatory consultations, all five beneficiary countries have expressed political willingness to operate collectively and to identify the most secure and logical hosting arrangement. Importantly, each country will retain complete and independent control over its own Standard Operating Procedures (SOPs) for alerting within its territory — including the criteria for when, how, and by whom alerts are issued. Financial and operational sustainability The Project’s regional, shared-services model significantly enhances financial sustainability. By deploying a single, cloud-based cell broadcast platform serving multiple countries, the Project reduces capital and operational costs compared to standalone national systems. Shared infrastructure, centralized maintenance, and harmonized technical standards lower recurrent expenditure and make ongoing operation feasible for Small Island Developing States with constrained fiscal space. Operational sustainability is further strengthened through clearly defined operations, maintenance, and testing procedures, agreed cost-sharing arrangements, and integration of emergency alerting responsibilities within regulatory and licensing frameworks applicable to MNOs. Regulatory and policy sustainability The Project supports the development and adoption of enabling legal and regulatory frameworks that formalize emergency alerting as a public interest service. By embedding Cell Broadcast obligations within telecommunications regulatory instruments and licensing conditions, the Project reduces reliance on ad hoc arrangements and ensures that emergency alerting functions remain enforceable and operational as networks evolve. Alignment with national DRM policies, digital transformation strategies, and climate resilience agendas further reinforces the policy relevance and durability of the system. Human and institutional capacity sustainability Sustainability is also supported through capacity building, training, and institutional learning. The Project equips
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		alerting authorities, regulators, and operators with the skills and procedures required to operate the system effectively over time. Harmonized SOPs and regular testing and simulation exercises reduce dependency on external technical support and help institutionalize good practice. The Project's emphasis on learning and knowledge capture ensures that operational experience informs continuous improvement and adaptation to evolving risks and technologies. Regional and global sustainability and scaling Beyond the five pilot countries, the Project establishes a replicable model for Cell Broadcast-based emergency alerting across the wider Caribbean and other SIDS and LDCs. Knowledge products, regulatory templates, and documented lessons learned will support future expansion with limited incremental investment. By contributing directly to Pillar 3 of the UN Secretary-General's EW4All, the Project aligns local sustainability with global momentum, increasing the likelihood of continued technical, institutional, and financial support beyond the initial CREWS investment. Overall sustainability judgment Taking these factors together, the Project's results are assessed as highly sustainable. The combination of regional ownership, regulatory embedding, cost-effective system design, and strong institutional capacity provides a robust foundation for long-term operation and expansion. While continued commitment from partners will remain essential, the Project's design significantly minimizes reliance on additional external financing and maximizes the likelihood that benefits will persist well beyond the Project's lifespan.	
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Attachment 1: Budget Breakdown (USD)

A. Budget by Project Outcome

Project Outcome	Description	Estimated Cost (USD)
Outcome 1	Improved early warning service delivery and accessibility through an operational Regional Emergency Alert System	
	Technical design and implementation follow up	200,000
	Procurement and deployment	2,800,000
Outcome 2	National legal, regulatory and institutional frameworks for emergency alerting strengthened and operational	
	Legal and regulatory support	200,000
Outcome 3	Early warning programmes are people-centred, gender-responsive and supported by strong public-private partnerships	
	SOP development	200,000
	Training and exercises	200,000
	Awareness campaigns	600,000
Outcome 4	Knowledge and lessons learned generated to support replication and scaling in the Caribbean and other SIDS	
	Knowledge products development	100,000
	Awareness raising and knowledge sharing events	200,000

Cross-cutting	Project coordination, M&E	
	Project coordination	450,000
	Midterm evaluation	50,000
Subtotal – Technical & Operational Activities		5,000,000
Project Management & Implementation Support	World Bank and ITU (implementation fees 10%)	500,000
Total Project Amount		5,500,000
	Total CREWS Contribution	5,060,000
	Total ACP EU Contribution	440,000

The ACP-EU co-financing complements CREWS funding and is fully integrated into the Project's implementation and budget structure, contributing to enhanced scope and sustainability of key activities.

B. Budget by Implementing Partner

Implementing Partner	Amount (USD)
World Bank	
CREWS - Execution (technical assistance, coordination, fiduciary oversight)	1,100,000
CREWS -Fees (project management and administration)	100,000
ACP-EU Co-financing	440,000
Subtotal – World Bank	1,540,000
International Telecommunication Union	
Execution (technical design, deployment support, regulatory guidance, capacity building)	3,600,000
Fees (project management and administrative support)	360,000
Subtotal – ITU	3,960,000
Total CREWS Contribution	5,060,000
ACP EU Contribution	440,000

Attachment 2: Workplan/Timeline for implementation

	Year 1				Year 2				Year 3				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Output 1.1: Regional Emergency Alert System operational and available for use																
Output 2.1: Regulatory and legal frameworks for Cell Broadcast alerting strengthened.																
Output 3.1: Standard Operating Procedures (SOPs) for warning generation, approval, dissemination, testing and maintenance developed and operational																
Output 3.2: Institutional capacity strengthened through training, exercises and operational readiness activities																

Output 3.3: Public awareness and outreach activities implemented.																
Output 4.1: Technical studies, knowledge products and implementation guidance developed																
Output 4.2: Regional and global knowledge exchange facilitated																
Mid-term evaluation completed																

Attachment 3: Logical framework
Refer and Ensure alignment to the CREWS MEAL framework

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Responsible
Impact							
Effective, impact-based sub-regional emergency alert communication and dissemination system operational in five E countries	Number of people living in SIDS with access to and receiving CREWS-supported early warning services via Cell Broadcast (sex-disaggregated: approximately 50% women and 50% men, to be confirmed and tracked through project monitoring)	0 people are receiving CB messages	510,328 people with access to improved warning services (Dominica: 66,205; Grenada: 117,207; Saint Lucia: 180,149; Saint Vincent and the Grenadines: 99,924; St. Kitts and Nevis: 46,843),	Project implementation reports	Direct	6 months	WB/ITU
Outcome							
Outcome 1: Improved early warning service delivery and accessibility through an operational Regional Emergency Alert System	Number of operational regional Cell Broadcast Emergency Alert Systems	0	1	System reports	Direct	6 months	ITU/WB
	Number of participating countries connected to the EAS	0	5	Acceptance tests			
	Number of Mobile Network Operators integrated with the EAS	0	2	CAP message logs			
	Number of warnings disseminated using CAP-compliant workflows	0	50	Project reports			

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Responsible
Outcome 2: National legal, regulatory and institutional frameworks for emergency alerting strengthened and operational	Number of national legal and regulatory instruments approved, amended or operationalized for emergency alerting Number of countries with updated entries in the WMO Register of Alerting Authorities	0 0	5 5	Official gazettes; Regulatory decisions WMO Register	Direct	6 months	NTRCs
Outcome 3: Early warning programmes are people-centred, gender-responsive and supported by strong public-private partnerships	Number of countries applying operational EAS SOPs Number of national public awareness campaigns implemented Percentage of outreach activities incorporating gender-responsive messaging Number of private sector entities formally engaged in EAS implementation and operation	0 0 0%	5 5 100%	SOP approval records Training reports Campaign reports MNO participation reports	Direct	6 months	WB/ITU
Outcome 4: Knowledge and lessons learned generated to support replication and	Number of technical and knowledge products developed Number of regional knowledge sharing events conducted	0 0	2 1	Publications Event reports	Direct	6 months	WB/ITU

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Responsible
scaling in the Caribbean and other SIDS	Number of international dissemination platforms/events supported	0					
Output							
Output 1.1: Regional Emergency Alert System operational and available for use	Regional Cell Broadcast EAS deployed and operational Participating countries onboarded to the EAS	0 0	1 5	Project implementation reports	Direct	6 months	ITU / WB
Output 2.1: Legal and regulatory frameworks for Cell Broadcast emergency alerting strengthened .	Number of national legal and regulatory instruments developed, adopted or updated	0	5	Official publications	Direct	6 months	NTRCs
Output 3.1: Standard Operating Procedures (SOPs) for warning generation, approval, dissemination, testing and maintenance developed and operational	# of SOP that are operational and linked to prediction and warning services.	0	5	SOP documentation	Direct	6 months	NEMOs/NTRCs

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Responsible
Output 3.2: Institutional capacity strengthened through training, exercises and operational readiness activities	Number of training programmes delivered	0	5	Training reports	Direct	6 months	WB / National Authorities
	Government and alerting authority personnel trained	0	50				
	Mobile Network Operator personnel trained	0	10				
	Simulation and testing exercises conducted	0	5				
Output 3.3: Public awareness and outreach activities implemented.	National public awareness campaigns completed	0	5	Campaign reports	Direct	6 months	WB / National Authorities
	Estimated number of people reached through awareness campaigns	0	300000				
	Gender-responsive communication products developed	0	5				
Output 4.1: Technical studies, knowledge products and implementation guidance developed	Knowledge products published	0	2	Publications	Direct	6 months	WB/ITU

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Responsible
Output 4.2: Regional and global knowledge exchange facilitated	Regional knowledge exchange events conducted	0	1	Event reports	Direct	6 months	WB/ITU
	International dissemination events/platforms supported	0	3				

The Project contributes directly to the following CREWS MEAL indicators

- Number of people living in SIDS with access to and receiving CREWS-supported early warning services.
- Number of national plans, strategies and legislations on early warning approved and/or implemented.
- Number of updated entries in the WMO Register of Alerting Authorities.
- Number of hazards which pose a risk of life and economic loss for which forecasting and warning services are in place with CREWS support.
- Number of warnings issued in Common Alerting Protocol (CAP) format.
- Number of Standard Operating Procedures operational and linked to warning services.
- Number of women and men trained through capacity-building activities.
- Number of gender-responsive early warning outputs and activities implemented.
- Number of private sector organizations actively engaged in early warning service delivery and sustainability.

CREWS MEAL Outcomes		Outcome 1. National and local multi- hazard early warning systems prioritized and funded			Outcome 2. Improved early warning service delivery and accessibility by national and regional institutions				Outcome 3. Early warning programmes are driven by people- centered and gender responsive principles and promote private sector engagement	
CREWS MEAL Outputs	Project Outputs	Output 1.1. A country and/or region has developed or strengthened legislative and/or institutional frameworks to support and sustain multi- hazard early warning systems	Output 1.2. Multi- hazard needs, gaps and priority assessments, analyses and related investment plans for early warning systems in a country or region are driven by CREWS financing	Output 1.3. Partnerships and cooperation frameworks developed for financing and scaling up support to multi-hazard early warning systems	Output 2.1 Risk information and tools generated by countries to enable the delivery of impact- based early warnings	Output 2.2. Monitoring, analysis and forecasting of hazards that threaten the country/region are improved and sustained by the countries	Output 2.3 Warnings are communicated by the countries based on common alerting protocols under agreed standard operational procedures (SOPs)	Output 2.4 Warnings are received, understood and acted upon based on co- produced preparedness and response plans by the countries	Output 3.1 People of different backgrounds, gender, youth, older persons, persons with disability, poor, marginalized, displaced, and non- native, as well as related institutions have co- produced climate and weather information products tailored to their needs	Output 3.2 Private sector is engaged to foster innovation and sustainability in delivery of early warning services
								✓		✓
	Output 1.1: Regional Emergency Alert System operational and available for use							✓		
	Output 2.1: Legal and regulatory frameworks for Cell Broadcast emergency alerting strengthened	✓						✓		
	Output 3.1: Standard Operating Procedures (SOPs) for warning generation,						✓			✓

approval, dissemination, testing and maintenance developed and operational									
Output 3.2: Institutional capacity strengthened through training, exercises and operational readiness activities	✓								
Output 3.3: Public awareness and outreach activities implemented.						✓			
Output 4.1: Technical studies, knowledge products and implementation guidance developed			✓				✓		
Output 4.2: Regional and global knowledge exchange facilitated			✓				✓		

Attachment 4: Monitoring and Evaluation Plan

4.1 Theory of Change

The Caribbean has made significant progress in hazard monitoring, forecasting, and impact-based warning services through investments supported by CREWS and other development partners. However, a critical gap remains in the final stage of the early warning chain: ensuring that authoritative warnings are disseminated rapidly, reliably, and directly to people at risk. Across the five participating OECS countries—Dominica, Grenada, Saint Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines—existing dissemination approaches rely heavily on traditional media, social media, websites, and SMS-based solutions, which may not be sufficiently effective during fast-onset emergencies and may fail to reach visitors, transient populations, and all individuals located within hazard-affected areas.

The Project is founded on the premise that if a regional, standards-based Cell Broadcast Emergency Alert System (EAS) is established and operationalized, supported by enabling legal and regulatory frameworks, harmonized operational procedures, trained institutions, active Mobile Network Operator participation, gender-responsive public awareness activities, and informed communities, then participating countries will be able to deliver timely, trusted, geotargeted, CAP-compliant, and people-centred emergency warning services to populations at risk.

The Project contributes to the objectives of CREWS and the EW4All initiative by addressing a critical gap in warning dissemination and communication while promoting people-centered, gender-responsive, and sustainable early warning services.

Causal Pathway

Inputs and Enabling Conditions

The Project mobilizes CREWS and ACP-EU financing together with the technical expertise and institutional support of the World Bank, ITU, ECTEL, CDEMA, CTU, CMO, participating governments, national alerting authorities, telecommunications regulators, and MNOs. The Project also builds on previous analytical work, readiness assessments, stakeholder consultations, and regional studies undertaken through earlier CREWS-supported activities.

Outputs

The Project will deliver the following outputs:

- *A regional cell broadcast EAS deployed and operational across five OECS countries and integrated with participating MNOs.*
- *Legal, regulatory, and institutional frameworks strengthened through regional model instruments and national implementation measures.*
- *Standard Operating Procedures for alert generation, approval, dissemination, testing, maintenance, and system operation developed and operationalized.*
- *Alerting authorities, regulators, and MNOs trained through structured capacity-building program and exercises.*
- *Gender-responsive public awareness and outreach campaigns implemented in all participating countries.*
- *Technical studies, knowledge products, implementation guidance, and lessons learned developed and disseminated to support future replication and scaling.*
- *Public-private partnerships strengthened to support long-term sustainability of warning services*

Intermediate Outcomes

As a result of these outputs:

- *Alerting authorities, telecommunications regulators, and MNOs operate within clear and harmonized legal, regulatory, and institutional frameworks that support emergency alerting services.*
- *Common Alerting Protocol (CAP)-compliant procedures for the generation, approval, dissemination, testing, and management of emergency alerts are operational across participating countries.*

- *The Regional EAS and participating mobile networks provide reliable, near-instantaneous, and geographically targeted dissemination of emergency alerts for multiple hazards.*
- *National alerting authorities, regulators, and MNOs have the technical and operational capacity to issue, coordinate, manage, test, and maintain emergency alerting services.*
- *Public awareness of cell broadcast alerts and appropriate protective actions increases among resident and transient populations.*
- *Women, men, older persons, persons with disabilities, visitors, and other vulnerable groups have improved and more equitable access to authoritative warning information.*
- *MNOs actively participate in the operation, maintenance, testing, and continuous improvement of emergency alerting services, supporting their long-term sustainability.*
- *Technical knowledge, implementation experience, and lessons learned are documented and shared to support future replication and scaling in other Caribbean countries, SIDS, and LDCs.*

Outcomes

The EAS will support warning dissemination for multiple hazards that pose significant risks to life and economic activity in the Eastern Caribbean, including tropical cyclones, flooding, storm surge, landslides, tsunamis, earthquakes, volcanic eruptions, droughts, and extreme heat

The Project will result in:

- Improved early warning service delivery and accessibility through a fully operational regional EAS;
- Strengthened legal, regulatory, and institutional frameworks that support sustainable emergency alerting services;
- More people-centred, gender-responsive, and inclusive warning programmes supported by active public-private collaboration; and
- Enhanced regional and global knowledge sharing to support replication and scaling of Cell Broadcast-based warning services

Impact

Approximately 510,328 people living in the five participating Eastern Caribbean countries, together with tourists and other roaming mobile users, have access to improved, timely, authoritative, geotargeted and actionable early warning services, enabling them to take protective action and contributing to reduced disaster impacts, reduced loss of life, and strengthened resilience.

As a result, individuals, communities, businesses, and institutions are better able to take protective action before and during hazardous events, contributing to reduced loss of life, reduced disaster impacts, and strengthened resilience to natural hazards and climate-related risks.

Key Assumptions

The Theory of Change is based on the following assumptions:

- *Participating governments continue to support regional cooperation while maintaining national ownership of alert issuance.*
- *MNOs remain committed to integrating, operating, and maintaining Cell Broadcast capabilities within their networks.*
- *Regulatory authorities adopt and implement the legal and policy measures necessary to support emergency alerting.*
- *Alerting authorities retain sufficient institutional capacity and resources to operate the system effectively.*
- *Mobile network coverage and device compatibility remain adequate to support widespread alert delivery.*
- *Members of the public trust official alerts and take appropriate protective action when warnings are received.*
- *Regional organizations continue to provide coordination, technical support, and leadership for future expansion of the system.*

Key Risks

Several risks could affect the achievement of the Project's intended results:

- *Insufficient coordination or sustained engagement among participating stakeholders.*
- *Delays caused by major disasters that require institutions and telecommunications providers to prioritize emergency response activities.*
- *Challenges in securing long-term financing for system operation, maintenance, and future upgrades.*
- *Changes in regulatory priorities, telecommunications market conditions, or institutional arrangements.*
- *Limited public awareness or misunderstanding of Cell Broadcast alerts during the early stages of implementation.*

Summary Logic Model

Inputs and Partnerships

Financing, technical assistance, regional institutions, national authorities, regulators, MNOs, and stakeholder coordination mechanisms.



Outputs

Regional EAS deployed; regulatory frameworks strengthened; SOPs developed; institutions trained; public awareness campaigns implemented; knowledge products produced.



Intermediate Outcomes

Improved institutional coordination; strengthened operational capacity; enhanced warning dissemination capability; increased accessibility and understanding of warnings; stronger public-private collaboration.



Outcomes

Participating countries provide improved early warning service delivery and accessibility through an operational regional Emergency Alert System; strengthened legal and institutional frameworks; people-centred and gender-responsive warning programmes; and enhanced knowledge generation and replication.



Impact

More people receive, understand, and act upon emergency warnings, leading to reduced disaster impacts and increased resilience in participating Small Island Developing States.

Inputs & Enabling Conditions	Outputs	Intermediate Outcomes	Outcomes	Impact
CREWS and ACP-EU financing; technical support from WB and ITU; engagement of ECTEL, CDEMA, CTU, CMO, NDMOs, NMHSs, regulators and MNOs; existing mobile network infrastructure; regional coordination mechanisms.	Regional Cell Broadcast EAS designed and deployed; legal and regulatory frameworks strengthened; SOPs developed and adopted; capacity-building and training delivered; operations and maintenance arrangements established; public awareness campaigns implemented;	Clear institutional roles and regulatory responsibilities; improved coordination among alerting authorities, regulators and MNOs; CAP-compliant alerting procedures operational; enhanced technical and operational capacity; increased public awareness and understanding of emergency alerts;	Timely, reliable, geotargeted and people-centered warning dissemination services operational across five Eastern Caribbean countries; improved accessibility of emergency warnings for residents, visitors and vulnerable groups; strengthened	More people receive, understand and act upon emergency warnings, leading to reduced loss of life, reduced disaster impacts, greater resilience, and increased access to early warning services across the participating SIDS.

Inputs & Enabling Conditions	Outputs	Intermediate Outcomes	Outcomes	Impact
	knowledge products developed and disseminated.	strengthened public-private cooperation.	regional cooperation and preparedness.	

4.2 Monitoring

The Project will implement a results-based MEAL approach aligned with the CREWS MEAL Framework and the Project Results Framework. Monitoring activities will track progress in the delivery of outputs, achievement of outcomes, and contribution to the Project's overall objective of improving access to timely and effective emergency warning services across the five participating OECS countries.

Monitoring will be coordinated by the World Bank in collaboration with ITU, national authorities, ECTEL, and other regional partners. Progress will be reviewed through regular implementation meetings, semi-annual progress monitoring, annual reporting, and verification of indicators contained in the Project Logical Framework. Particular attention will be given to the operational status of the Regional Emergency Alert System, implementation of legal and regulatory measures, operationalization of SOPs, institutional capacity development, engagement of MNOs, implementation of gender-responsive public awareness activities, production and dissemination of knowledge products and the number of people benefiting from improved warning dissemination services.

Data will be collected from project implementation reports, system testing and acceptance reports, CAP message logs, training and exercise reports, regulatory documents, WMO Register of Alerting Authorities records, awareness campaign reports, knowledge product dissemination records, event reports, and official information provided by participating institutions and MNOs.

Monitoring activities will also assess the implementation of people-centred and gender-responsive approaches, including the extent to which outreach activities and communication materials effectively reach women, older persons, persons with disabilities, visitors, and other vulnerable groups

Roles and Responsibilities for Monitoring Activities

Responsible	Tasks
World Bank	Overall monitoring coordination, consolidation of results, progress reporting to CREWS, and oversight of MEAL implementation.
ITU	Monitor technical implementation, system deployment, testing, operational readiness, and capacity-building activities.
ECTEL	Monitor progress related to regulatory harmonization and regional coordination activities.
National Alerting Authorities (NDMOs, NMHSs and other designated agencies)	Provide operational data and report on training, SOP implementation, testing exercises, and alerting readiness.
National Telecommunications Regulators	Monitor adoption and implementation of legal and regulatory measures supporting Cell Broadcast alerting.
Mobile Network Operators	Provide information related to system integration, operational performance, testing results, network coverage, maintenance activities, and participation in training and operational readiness exercises.

Responsible	Tasks
Regional Partners (CDEMA, CTU and CMO)	Support monitoring of regional coordination, knowledge-sharing, and institutional strengthening activities.

Baseline Data Report

1. Introduction

A baseline assessment will be conducted during the Project inception phase to establish the starting values for all indicators contained in the Results Framework. The assessment will compile available data from participating countries, regional institutions, telecommunications regulators, and MNOs. The baseline will serve as the reference point for measuring progress throughout Project implementation and will support performance monitoring, reporting, and evaluation.

2. Summary of the Intervention

The Project seeks to establish a regional Cell Broadcast-based Emergency Alert System serving Dominica, Grenada, Saint Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines. Through a combination of technology deployment, regulatory strengthening, institutional capacity development, public awareness, and regional cooperation, the Project aims to improve warning dissemination and communication and increase access to early warning services for populations at risk.

3. Baseline Values for Key Indicators

Indicator	Baseline	End-of-Project Target
Number of people living in SIDS with access to and receiving CREWS-supported early warning services through the Project	0	510,328 people
Number of operational regional Cell Broadcast Emergency Alert Systems	0	1
Number of participating countries connected to the Regional EAS	0	5
Number of Mobile Network Operators integrated with the EAS	0	2
Number of warnings disseminated using CAP-compliant workflows	0	50
Number of national legal and regulatory instruments approved, amended, or operationalized for emergency alerting	0	5
Number of countries with updated entries in the WMO Register of Alerting Authorities	0	5
Number of countries applying operational EAS Standard Operating Procedures	0	5
Number of national public awareness campaigns implemented	0	5
Percentage of outreach activities incorporating gender-responsive messaging	0%	100%
Number of private-sector entities formally engaged in EAS implementation and operation	0	2
Number of technical and knowledge products developed	0	2
Number of regional knowledge-sharing events conducted	0	1
Number of international dissemination platforms/events supported	0	3

<i>Number of national legal and regulatory instruments developed, adopted or updated</i>	0	5
<i>Number of national SOPs operational</i>	0	5
<i>Number of training programmes delivered</i>	0	10
<i>Number of government and alerting authority personnel trained</i>	0	50
<i>Number of Mobile Network Operator personnel trained</i>	0	10
<i>Number of simulation and testing exercises conducted</i>	0	5
<i>Estimated number of people reached through awareness campaigns</i>	0	300,000

The baseline report will be finalized during Project inception and updated periodically, as required, to support progress tracking, reporting, adaptive management, and reporting against the CREWS MEAL framework.

4.3 Evaluation

A single independent mid-term evaluation will be conducted during the third year of Project implementation to assess progress toward the achievement of Project outcomes, identify implementation challenges, document lessons learned, and provide recommendations for the remaining implementation period.

The evaluation will assess progress against the Project Results Framework and Theory of Change, including: (i) deployment and operational performance of the Regional Emergency Alert System; (ii) implementation of legal, regulatory, and institutional frameworks supporting emergency alerting; (iii) adoption and operationalization of SOPs; (iv) institutional capacity development and operational readiness of alerting authorities, regulators, and MNOs; (v) effectiveness of public awareness and gender-responsive outreach activities; (vi) private-sector engagement and sustainability arrangements; and (vii) production, dissemination, and use of knowledge products and lessons learned to support regional and global replication.

The evaluation will review progress against the Project's key outcome indicators, including improved access to warning services, operational status of the Regional EAS, implementation of enabling legal and regulatory frameworks, application of operational procedures, engagement of MNOs, implementation of gender-responsive awareness activities, and dissemination of knowledge products and replication activities.

The evaluation will be managed by the World Bank, in consultation with ITU and key Project partners, and carried out by an independent external evaluator. Findings and recommendations will be presented to participating countries, regional organizations, CREWS, and implementation partners to support adaptive management and inform any adjustments required during the remainder of Project implementation.

Evaluation Type	Evaluation Management	When It Will Be Performed	Resources	Budget (USD)
Mid-Term Evaluation (Independent External Evaluation)	Managed by the World Bank in consultation with ITU and Project partners; undertaken by an independent evaluator	Year 3	External evaluator, stakeholder consultations, document review, interviews, and field or virtual assessment missions	50,000

4.4 Learning

The Project will adopt a structured learning approach to ensure that implementation experience, lessons learned, operational feedback, and stakeholder perspectives are systematically captured and used to improve Project delivery, strengthen sustainability, and support future replication and scaling of Cell Broadcast-based warning services.

Lessons will be identified through implementation reviews, system testing and simulation exercises, training activities, stakeholder consultations, public awareness campaigns, gender-responsive outreach activities, participation of MNOs, operational use of the EAS, and the mid-term evaluation.

Knowledge generated during implementation will be incorporated into technical guidance materials, operational procedures, regulatory references, knowledge products, and regional and international dissemination activities to support replication in other Caribbean countries, SIDS, and LDCs.

Learning Plan

Type of Activity	Objective / Expected Results	Methodology / Material Needed	Target Audience / Participants	Execution Calendar
Implementation Review Meetings	Identify progress, challenges, lessons learned, and corrective actions	Progress reports, implementation updates, discussion sessions	World Bank, ITU, regional partners, national authorities	Semi-annually
Training and Simulation Debriefs	Capture operational lessons and improve procedures	Exercise reports, participant feedback, lessons learned notes	Alerting authorities, regulators, MNOs	After major training events and exercises
Mid-Term Evaluation Learning Workshop	Review evaluation findings and agree on implementation adjustments	Evaluation report and stakeholder workshop	Project partners and participating countries	Year 3
Knowledge Product Review and Dissemination	Validate lessons learned and support replication and scaling	Knowledge products, case studies, technical notes, dissemination materials	Regional organizations, development partners, governments, regulators, MNOs	Years 3–4

Learning findings will be regularly reviewed by the Project management team and partners and used to strengthen implementation, support adaptive management and decision-making, improve people-centred and gender-responsive approaches, enhance private-sector engagement, and increase the long-term sustainability, scalability, and replicability of the Regional Emergency Alert System.

Attachment 5: References

List of Acronyms

Acronym	Full Name
ASW	Accelerated Support Window
CANTO	Caribbean Association of National Telecommunication Organizations
CAP	Common Alerting Protocol
CARDTP	Caribbean Digital Transformation Project
CARICOM	Caribbean Community
CB	Cell Broadcast

Acronym	Full Name
CBC	Cell Broadcast Center
CBE	Cell Broadcast Entity
CBM	Cell Broadcast Message
CCCCC	Caribbean Community Climate Change Centre
CDEMA	Caribbean Disaster Emergency Management Agency
CIF	Climate Investment Funds
CIMH	Caribbean Institute for Meteorology and Hydrology
CMO	Caribbean Meteorological Organization
CREWS	Climate Risk and Early Warning Systems
CTU	Caribbean Telecommunications Union
CWC	Cable & Wireless Communications
DVRP	Disaster Vulnerability Reduction Project
EAS	Emergency Alert System
ECTEL	Eastern Caribbean Telecommunications Authority
ERC	Enhancing Resilience to Reduce Vulnerability in the Caribbean
EW4All	Early Warnings for All
GSMA	Global System for Mobile Communications Association
IBFWS	Impact-Based Forecasting and Warning Services
IFRC	International Federation of Red Cross and Red Crescent Societies
IPCC	Intergovernmental Panel on Climate Change
ITU	International Telecommunication Union
LDC	Least Developed Country
LTE	Long Term Evolution
MEAL	Monitoring, Evaluation, Accountability and Learning
MHEWS	Multi-Hazard Early Warning System
MNO	Mobile Network Operator
NDMO	National Disaster Management Organization

Acronym	Full Name
NETP	National Emergency Telecommunications Plan
NMHS	National Meteorological and Hydrological Service
NTRC	National Telecommunications Regulatory Commission
OECS	Organization of Eastern Caribbean States
O&M	Operations and Maintenance
OPEX	Operating Expenditure
PTWC	Pacific Tsunami Warning Center
QoS	Quality of Service
REAS	Regional Emergency Alert System
RSMC	Regional Specialized Meteorological Centre
SIDS	Small Island Developing States
SMS	Short Message Service
SOP	Standard Operating Procedure
SWS	Strengthening Weather Services
SWFDP	Severe Weather Forecasting Demonstration Project
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
USAID	United States Agency for International Development
USGS	United States Geological Survey
VPN	Virtual Private Network
WB / WBG	World Bank / World Bank Group
WHO	World Health Organization
WMO	World Meteorological Organization

Reference Materials

Comment Matrix (synthesis of comments received from Experts nominated by CREWS Steering Committee Members)