

Proposed decisions on modifications to the list of pipeline countries and project proposals to be prepared for future funding decisions

1. Two decisions are expected under Agenda item 4:
 - (i) Decision on countries/regions to be added to the CREWS pipeline list; and,
 - (ii) Decision on project proposal(s) to be prepared for future funding decisions.

2. There are currently 77 Least Developed Countries (LDCs) and small island developing States (SIDS)¹. The CREWS Secretariat compiles information on early warning systems for all LDCs and SIDS, in an ongoing manner, using three criteria reflecting need, demand and leveraging potential².

3. Based on the above and feedback from the three Implementing Partners, the Steering Committee regularly identifies countries and regions to be included in a pipeline list. Countries and regions are included on the pipeline list if they demonstrate a sufficient level of eligibility, ownership and readiness for the preparation of projects proposals for potential future funding decisions.

4. The current list of CREWS pipeline countries, as approved on 14 July 2018, is found in Annex 1 to this document.

5. The Steering Committee is invited to review and approve the inclusions of three countries to the pipeline list, namely:

Country/Region (in alphabetic order)	Indicative portfolio	Short description - briefs are included in Annex 2
Haiti (as a national project part of the on-going regional CREWS Caribbean project)	USD 1.5 million	The funding will ensure continued capacity building and technical assistance to the Haitian national meteorological services (Unité hydrometeorologique, UHM). Providing institutional support and facilitate early warning disseminations.
Mozambique	USD 2.0 million	CREWS funding will support the implementation of a Government disaster risk management program, specifically contributing to a component on local DRM committees and early warning systems and would directly leverage the USD 10 million that is budgeted for those components.
Sierra Leone (as a national project part of the on-going regional CREWS West Africa project)	USD 2.0 million	CREWS funding will build on a recently concluded hydromet strengthening project financed by the Global Environment Facility (managed by UNDP) and inform a new investment program, complementing an urban resilience government-led investments focusing on components around hydromet and end-to-end early warning systems.

¹ Source: United Nations/DESA, as of December 2018.

² (i) Exposure to risk and institutional capacity for early warning; (ii) Level of priority given to early warning systems by countries; and (iii) Potential for leveraging additional resources and aligning programmes.

6. The Steering Committee is invite to indentify countries/regions, for which project proposals will be prepared for future funding decisions. It is suggested to the Steering Committee, that proposals can be initiated for:
 - (i) Countries/regions included in the updated pipeline list; and,
 - (ii) Additional financing to existing CREWS projects that are found to have a sufficient rate of delivery and expenditure and for which specific new requirements to achieve its objectives have been identified.
7. The CREWS West Africa project currently meets the criteria for additional financing (See Brief in Annex 3).
8. The project proposals will be prepared in accordance with the procedures set-out in the *CREWS Operational Procedures Note No 1 Programming and Project Development* to be submitted at a date to be defined, to the Steering Committee for consideration, review and approval for funding, depending on the availability of funds in the CREWS Financial Intermediary Fund (FIF).
9. Based on projected income and expenditure for the FIF for his Fiscal Year, the Steering Committee is invite to propose the preparation of projects for an approximate total of USD 5 million.

ANNEX 1 – CREWS Pipeline countries, as approved on 14 June 2018

See CREWS/SC.6/workdoc.4 for a complete set of pipeline country briefs.

Country/Region (in alphabetic order)	Indicative portfolio in US\$ millions	Proposed Partnerships
*Afghanistan	3.0	(WB/GFDRR, WMO)
Benin	3.0	(WB/GFDRR; WMO)
Bhutan	3.5	(WB/GFDRR; WMO)
*Chad	3.0	(WB/GFDRR; WMO)
Curacao	1.65	(WMO;WB/GFDRR)
Ethiopia	3.0	(WB/GFDRR; WMO)
Indian Ocean Region	2.5	(WMO; WB/GFDRR; UNISDR)
Madagascar	3.0	(WB/GFDRR; WMO)
*Togo	2.25	(WB/GFDRR; WMO)

*Financing decisions to be discussed at the 8th Meeting.

ANNEX 2 –Pipeline Countries Briefs

Country/Region	Haiti							
LDC or SIDS Profile	Level of Disaster Risk	Very High	Average annual loss to disasters	USD 830 Million (2005-2014)	Access to information & communications (ICT index)	Ranked 168th in the ITU’s ICT Development Index 2017 ³	Capacity of NMHS	Low
	Status of hydromet and EWS	Low	Disaster loss and risk data to inform early warning		Demand/Priority	High	Leveraging potential	High
Context	<p>CREWS-Haiti will be a national sub-project under the on-going regional Caribbean project “Strengthening Early Warning and Hydrometeorological Services in the Caribbean” (Caribbean CREWS). Haiti is the only least-developed country in the Caribbean⁴ and is also classified as a small island developing state (SIDS).</p> <p>Haiti scored “very high”⁵ on the 2018 INFORM Risk Index . Moreover, the World Bank’s “Natural Disaster Hotspot Study”⁶ ranked Haiti as one of the countries with the highest exposure to multiple hazards, and the SIDS with the highest vulnerability to tropical cyclones⁷. Between 1900 and 2016 more than one hundred natural disasters affected the country⁸, and more than 98% of the population are exposed to the risk of at least two among the following natural disasters: earthquakes, hurricanes, landslides, flooding and drought⁹.</p> <p>The vulnerability of the Haitian population is caused by the exposure to hydrometeorological events including tropical storms and</p>							

³ <http://www.itu.int/net4/ITU-D/idi/2017/>

⁴ <https://unctad.org/en/Pages/ALDC/Least%20Developed%20Countries/UN-list-of-Least-Developed-Countries.aspx>

⁵ <https://www.preventionweb.net/countries/hti/data/>

⁶ Dilley, M & Chen, R.S. & Deichmann, U & Lerner-Lam, A & Arnold, M & Agwe, J & Buys, P & Kjekstad, O & Lyon, Bradfield & Yetman, Greg. (2005). Natural disaster hotspots: A global risk analysis. World Bank Disaster Risk Management Series. 5. 1-132. 10.1007/978-3-322-82113-3_1.

⁷ http://web.worldbank.org/archive/website01539/WEB/IMAGES/GFDRR_HA.PDF

⁸ https://www.unisdr.org/files/54921_annex03documentpayshaiti.pdf

⁹ *ibid.*

	<p>cyclones, and also demographic factors such as poverty, high population density, the presence of settlements in low-lying areas and floodplains. Moreover, the lack of political stability, serious fiscal problems and weak public infrastructure increases the risk to the population¹⁰.</p> <p>An essential step to achieve resilience to climatic shocks and a sustained development of Haiti is to secure efficient Hydro-meteorological services:</p> <p>WMO, with the funding support from Environment and Climate Change Canada (ECCC), implemented the project “Climate Services to Reduce Vulnerability in Haiti” (2012-2019). The main achievements of this project include the construction of a zero-emission, hurricane and earthquake resistant building for the Unité Hydro Météorologique (UHM), and the development and installation of a technical assistance package providing the UHM with the necessary technical equipment and training for weather forecasting, observation and aviation meteorology. The WMO Project Office in Haiti was operational from September 2013 until 31 March 2019. To leverage the results achieved through this investment, and ensure the medium-term sustainability of the project investments, further training in the utilization and maintenance of the technical instruments installed through the TAP would be of great importance.</p> <p>The World Bank “Strengthening Hydro-Meteorological Services Project for Haiti” (Hydromet) objective is to strengthen the UHM capacity to collect and manage hydro-meteorological data. The project encompasses the installation of additional automatic meteorological and gauging station (hydrological stations) to the current network and the development of a data management platform to gather, manage, analyze and export hydro-meteorological data collected from the field. The project also supports the development of a modelling platform based on wide watersheds to complement the FFGS modelling, that will provide more relevant information to end users. In order to make the newly installed equipment operational after the project end date (30th June 2020), hands-on training of the UHM staff will be necessary to produce the hydrological stations rating curves and ensure a follow up of the created model to guarantee a proper calibration and reflect adequately the actual flooding conditions. This training will also help scale-up the modelling platform into a flooding model using digital Elevation Model (DEM).</p>
<p>Priority Needs</p>	<ul style="list-style-type: none"> • Institutional support to UHM; • Continued technical assistance to support the UHM (In collaboration with MétéoFrance Martinique and MétéoFrance Intl); • Continued dialogue between WMO, WB and the Ministry of Agriculture, Natural Resources and Rural Development (MARNDR); • Capacity building for NMHS and NDMO staff in EWS <ul style="list-style-type: none"> • Modelling

¹⁰ http://web.worldbank.org/archive/website01539/WEB/IMAGES/GFDRR_HA.PDF

	<ul style="list-style-type: none"> • System maintenance • Dissemination and communication • Dissemination system (MétéoFactory) for EWS
Overall Budget	\$ 1,5 million
Timeframe	2019-2022
Partners	WMO (lead), World Bank

Country/Region	Mozambique							
LDC or SIDS Profile	Level of Disaster Risk	High	Average annual loss to disasters	>US\$ 150 million ¹¹	Access to information & communications (ICT index)	Ranked 150 th in the ITU's ICT Development Index 2017	Capacity of NMHS	Medium
	Status of hydromet and EWS	Medium	Disaster loss and risk data to inform early warning	National-level disaster risk assessment & financial protection study completed ¹¹	Demand/Priority	High	Leveraging potential	High The proposed CREWS grant would be leveraged directly by a \$80 million World Bank PforR operation

¹¹ World Bank, 2018. Financial Protection against Disasters in Mozambique. Available at: <https://www.gfdrr.org/sites/default/files/publication/bm-brochura-pfc-en.pdf>

<p>Context</p>	<p>Mozambique has been impacted twice in the last month by cyclones. These have tested the state of the current early warning systems. WMO and the World Bank will have teams working with the government in the coming weeks to evaluate what has worked well and what needs further improvements. Information from these engagements would inform and shape a final proposal should we be invited to present one.</p> <p>Mozambique is highly-exposed and vulnerable to natural hazards and climate variability with drought, flooding, and tropical cyclones comprising the most frequent climate shocks. The frequency and intensity of climate-related shocks have intensified over the past four decades. Over half of its population is vulnerable to climate-related shocks and the impacts of disasters on the country's budget and economy are sizable. Assets worth approximately 37 percent of GDP are exposed to two or more natural hazards, which translates into 1.1 percent annual average loss in GDP. The costs of the 2000 floods were estimated at almost US\$ 450 million (or nearly 9% of GDP) and for the Limpopo river floods in 2013 the sum exceeded US\$ 517 million (both at current values).</p> <p>Effective early warning for flood and cyclone is particularly important in Mozambique. Because of the sheer size of the country and the limited government budget, it is impossible for the government to provide effective flood protection and cyclone-resistant buildings in all high-risk areas. Large parts of the population therefore rely on Local Disaster Risk Management Committees (<i>Comitês Locais de Gestão do Risco de Calamidades</i>) and individual early action as a first line of defense. It is therefore imperative that reliable and actionable early warning information is produced and transmitted to the local level within a short time span.</p> <p>The responsibilities within the national early warning system are spread across institutions. For weather and flood warnings, the INGC holds overall coordination responsibilities for the system, but monitoring is carried out by the National Directorate of Water (NDA), which is responsible for flood forecasting, in collaboration with INGC and the National Institute of Meteorology (INAM). INAM is responsible for routine and severe weather forecasts and warnings, including thunderstorms and tropical cyclones. INAM is also the national focal point for tsunami warnings. Other national and provincial information providers include ARA – Regional Water Authority; MINAG – Ministry for Agriculture; IIAM – Institute for Agrarian Research; DNSA – National Directorate for Agriculture Extension; INAMAR – National Maritime Institute; IDPP – Institute for the Development of Artisanal Fishery; INAHIMA – National Institute for Hydrography and Navigation. In addition, DNG – National Directorate for Geology provides earthquake related information.</p> <p>INGC is responsible for translating early warning information into alerts and communicating these to local actors. This information flows between local actors and INGC is critical for an up to date understanding of the situation and to direct relief efforts accordingly. The government expects international partners to act as one during disaster response, which should improve the effectiveness of the</p>
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	<p>emergency response. However, current evidence suggests that there is too much dependence on personal contacts rather than well-defined institutional structures¹². Important gaps exist across the information flow, including in institutional collaboration, lack of centralized information processing, limited accuracy and geographical coverage, and lack of last-mile connectivity of warnings to people at risk as the main bottlenecks in the national early warning cycle. Previous donor-funded pilots have created a strong baseline understanding of possible options to address some of these challenges, for example through the centralized SMS-based dissemination system (<i>DataWinners</i>) developed by USAID and the community-based forecast-based action projects of the Red Cross. However, to date such pilots have been limited to small areas and have not been incorporated in the institutional way of working nor upscaled to the national level.</p> <p>The World Bank is currently preparing a \$80 million Program for Results (PforR) operation that will support the Government’s overall disaster risk management program, including (1) the establishment of a DRM fund; (2) the procurement of sovereign risk insurance; (3) investments in school retrofit against flood and cyclone; (3) the strengthening of local DRM committees across risk areas; and (4) the strengthening of the national early warning system. CREWS funding would be instrumental in steering the implementation of the components on local DRM committees and early warning systems and would directly leverage the \$10 million that is budgeted for those components.</p>
Priority Needs	<p>Recent engagements of the World Bank and its partners on early warning, including a Bank lending project on hydro-meteorological services¹³ and a recently completed study on early warning information flows¹⁴, have shown that the bottlenecks in the Mozambican system are shifting to information processing, institutional coordination and information dissemination more so than equipment. Based on the assessments and an ongoing dialogue with INAM, DNA and INGC, three key priorities for improving early warning systems have been identified as priority needs: (1) further strengthening the modelling of critical levels and impact-based early warnings, especially related to river flooding; (2) strengthening inter-institutional collaboration and centralized information management; and (3) strengthening the dissemination system to reach at-risk communities with timely and actionable information.</p> <p>The proposed approach is broken down in the following specific activities:</p> <ul style="list-style-type: none"> • Modeling & Alerts: identification of priority risk zones for which no flood alerts are being produced; strengthening of real-time flood hazard models in one or two priority areas, based on international advances in the use of global modelling tools

¹² República De Moçambique Ministério Da Planificação E Desenvolvimento Ministério Da Administração Estatal (2014). Rules, Procedures and Standards for the Flow of Information on Disasters

¹³ Enhancing Spatial Data for Flood Risk Management Project (P149629)

¹⁴ República De Moçambique Ministério Da Planificação E Desenvolvimento Ministério Da Administração Estatal (2014). Rules, Procedures and Standards for the Flow of Information on Disasters

	<p>(e.g. GLOFAS; GLOFFIS) and available national data and models.</p> <ul style="list-style-type: none"> • Institutional Coordination: establishing updated MoUs between the main agencies involved in the EWS information flow (at least DNA; INAM; INGC); review of the current translation of technical alert information into early warning levels and developing an improved method; strengthening the systematic links between national and sub-national entities in order to improve information flow. • Dissemination system: reviewing the best practices in disseminating early warning messages to the community level in a trackable and systematic way, both in Mozambique and internationally; institutionalizing one systematic methodology that can be upscaled nationally, potentially based on currently piloted SMS-based systems; connecting communities in priority risk areas to the system and testing. <p>The proposed approach explicitly follows CREWS priorities:</p> <ul style="list-style-type: none"> • Sustained engagement with country institutions: the proposed project is fully embedded in country systems and institutions. The approach addresses both institutional and technical gaps, and aims to build on systems and tools that have proven to be effective in the local institutional context. • Coherence promotion: the activity aims to strengthen coherence in the national early warning system by reviewing existing pilot activities and converging to a single, systematic and transparent flow of information from modelling to community alerts. • Solution orientation: the activities will be designed with the final end goal in mind, i.e. increasing the number of communities that receive reliable and actionable early warning information. The project would do little to no base data creation that is disconnected from this final purpose. • People-centered focus: as per the design of the Program for Results operation, the engagement of early warning system strengthening will go hand in hand with the strengthening of Local Disaster Risk Management Committees (<i>Comitês Locais de Gestão do Risco de Calamidades</i>) at the community level. These committees, made up from voluntary community members, will be the main beneficiaries of the information and will very much steer the design of the proposed dissemination system. • Gender-sensitive approach: the Local Disaster Risk Management Committees are generally made up of 50% male and 50% female members. In the design of the improved early warning dissemination system, great care will be given to tailoring the messaging to both male and female community members. • Investment multiplier: the proposed CREWS grant would directly leverage at least \$10 million of World Bank financing through the \$80 million PforR operation. In addition, it will leverage previous investments in hydromet equipment by the World Bank, GIZ and other partners, by turning that data into actionable information at the community level.
Overall Budget	\$ 2.0 million
Timeframe	2019-2021
Partners	World Bank, WMO, Mozambican Red Cross

Country/Region	Sierra Leone, West Africa							
LDC or SIDS Profile	Level of Disaster Risk	High	Average annual loss to disasters	US\$ 7.72 million for flooding. Relative to capital stock, Sierra Leone has the 2nd highest Flood AAL of the SSA region, of 0.255%.	Access to information & communications (ICT index)	Sierra Leone is one of the few countries that is not ranked on the global ICT index.	Capacity of NMHS	Low
	Status of hydromet and EWS	Low capacity	Disaster loss and risk data to inform early warning	Damage and Loss Assessment (2017); Multi-city hazard and risk assessment (2018)	Demand/Priority	High	Leveraging potential	High \$60 million
Context	<p>With a topography characterized by mountains, steep slopes and low-lying coasts coupled with high annual rainfall¹⁵, Sierra Leone is highly exposed to natural shocks, such as floods, wind storms, landslides, and coastal erosion, with 13 percent of the country's area and more than 35 percent of its population at-risk to multiple hazards.¹⁶ Frequent, localized events disrupt livelihoods and economic production, destroy physical infrastructure, and impose high public and private costs for reconstruction and rehabilitation, posing a potential risk to Sierra Leone's macroeconomic stability and contributing to increased levels of poverty. Rapid urbanization in a context of inadequate land use planning and development control, which have resulted in an increase in informal settlements and development in disaster-prone areas, and a concentration of a large percentage of the population in coastal areas, have exacerbated Sierra Leone's vulnerability to adverse natural events and associated impacts, while weak enforcement capacity of building codes, poverty and planning regulations has resulted in a building stock prone to damage by floods and landslides. The capital's coastal position, on a peninsula and surrounded by mountains means there is limited space for the city to expand. An accelerating ribbon development along the coast, along river channels and into the more elevated, steeper and forested central mountain belt are resulting in increasing exposure of people and assets to landslides, floods and sea-level rise. Furthermore, the recently completed Multi-City Hazard and Risk Assessment for Freetown, which developed city-scale hazard and</p>							

¹⁵ Mean annual rainfall for the whole country is around 2,500 mm, the 11th country in the world with highest annual rainfall and the second in Africa, just behind Sao Tome and Principe. https://data.worldbank.org/indicator/ag.lnd.prcp.mm?year_high_desc=true

¹⁶ Over 10% of all settlements are located on either steep slopes or below sea level, which is far higher than any other city in Sub-Saharan Africa. One of the largest slums in Freetown Kroo-Bay has flooded every year since 2008.

exposure maps for the city, indicates that over 100,000 people, or around 10 percent of the population, and 12,000 buildings are currently situated in high combined-hazard zones in the capital city alone¹⁷. When accounting for climate change impacts up to 2050, this number doubles to 200,000 people and 25,000 buildings, of which, 13,270 formal buildings (15 percent of all formal buildings) and 11,190 are informal buildings (23 percent of all informal buildings). Climate change is expected to exacerbate disaster risks in the country.

In the last 15 years, four major floods have affected over 220,000 people and caused severe economic damage, while the recent landslides of rare magnitude on August 14th, 2017, hit the country's capital city, disrupting economic activity and leading to significant losses of lives, productive assets, and public infrastructure. National Oceanic and Atmospheric Administration's satellites captured the rainfall intensity, recording 7-day total rainfall anomalies of up to 100 mm more than usual for the week of August 10–16. This represents nearly 200 percent of the typical rainfall for that period. In addition, over a longer preceding period, the U.S. National Weather Service's Climate Prediction Center states that 1,040 mm of rain fell in Sierra Leone from July 1 to August 14, 2017. This represents three times the amount expected for this period. The event had a massive human impact, with 1,141 declared dead or missing and over 6,000 people affected. The landslide caused major destruction of infrastructure, including 349 buildings, bridges, roads, schools, and health facilities. On the same day, flooding throughout the city also damaged infrastructure and affected households. The total economic value of the effects of the landslides and floods was estimated at US\$31.65 million. The total recovery needs have been estimated at US\$82.41 million¹⁸. Several donors and development partners supported the country's recovery effort. The World Bank has provided financing of over \$20 million, including supplemental grant financing of \$10 million in budget support from an ongoing Development Policy Operation (DPO), and US\$10 million for the Freetown Emergency Recovery Project (FERP) to finance specific resilient recovery and reconstruction priorities.

In the wake of the recovery, after taking office in April 2018, the new Government has prioritized strengthening DRM capabilities and institutional arrangements, including the establishment of a dedicated National Disaster Preparedness and Management Agency (NDPMA). Importantly, one of the four priority goals of the forthcoming *2019-2023 Medium-Term National Development Plan* focuses on "moving towards an inclusive, climate resilient, and sustainable development"¹⁹. The government has already started the development of a Bill for this new Agency and has requested support from the World Bank to support this process and strengthen the capacity of the new Agency, with a focus on early warning, preparedness and response. In addition, cognisant of the

¹⁷ The Multi- Hazard and Risk Assessments were similarly conducted for Makeni and Bo; financed by ACP-EU NDRR program, through GFDRR. The reports also include preliminary recommendations for disaster risk management activities for each city.

¹⁸ Sierra Leone 2017 Landslides and Flooding Damage and Loss Assessment. World Bank. September 201 (financed by ACP-EU Grant).

¹⁹ Sierra Leone Medium-Term National Development Plan 2019-2023. *Education for Development: A New Direction for Improving People's Lives, through Education, Inclusive Growth, and Building a Resilient Economy*. Forthcoming May 2019.

	<p>low capacity of the national and meteorological and hydrological system (NMHS), the Government recently established a new hydrological agency, under the Ministry of Water Resources, responsible for river monitoring and watershed management. The Ministry of Water Resources has requested World Bank support to build the capacity of this new agency. The Meteorological Agency, under the Ministry of Transport, which has been established for a number of years, remains weak, as it has very limited weather stations and rain gages and requires support in modelling and forecasting.</p> <p>The potential of this program to leverage additional financing is high. A new \$50 million World Bank urban resilience project is under preparation (expected Board approval in March 2020), which will have a significant component dedicated to strengthening the capacity, equipment and infrastructure for emergency preparedness and response, including early warning systems. The investments under this project will be informed by an ongoing capacity needs assessment for the national emergency preparedness and response system, financed by the FERP. This proposed CREWS program has the potential to build on recently concluded hydromet strengthening project financed by the Global Environment Facility (managed by UNDP), and inform a new large investment program, complementing government-led investments in equipment, infrastructure and capacity, with World Bank technical assistance and capacity building around hydromet and end-to-end early warning systems.</p>
<p>Priority Needs</p>	<p>Within the high-risk context highlighted above, a range of measures are required to manage this existing risk, one of the most cost-effective life- and property-saving measures there is, is to establish an early warning system that is able to give communities some lead time ahead of a disaster event. To that end, three key priorities have been identified:</p> <p>1. Hydromet Systems strengthening/weather stations: In order to develop accurate models to accurately predict flash flooding and landslides, more accurate and localised hydromet is required. Rainfall patterns and intensity vary across the Freetown peninsula because of atmospheric conditions and localized topography. However, accurate rainfall data is not widely available for different locations across Freetown due to a limited number of weather stations. There is one at Lungi airport and another in Wilberforce. Thus, rainfall in certain catchments cannot be determined. Investments in more low cost, low maintenance weather stations across the Freetown peninsula will allow for more accurate local forecasting and rain-fall measurements. This can be used for a range of things, including more detailed flood and landslide risk assessments and early warning systems. Work would be done to calibrate landslide trigger analysis, to better understand how localised rainfall data can be used to assess calculate ground saturation levels, which is a key trigger for landslides.</p> <p>2. Digital Elevation Model. Another key limitation in accurate flood and landslide modelling for the purposes of early warning, is the lack of detailed digital elevation models. A greater level of detail would significantly increase the accuracy of flood and landslide risk maps and would help to calibrate more accurate forecasting and warning systems.</p> <p>3. Community risk mapping; community early warning systems and preparedness planning. Combined with better hazard information at local level, more granular exposure and vulnerability data is also required to understand flood and landslide dynamics</p>

	<p>in communities. Work is therefore needed to do detailed community mapping work to map out buildings and other key infrastructure such as roads, water supply and sanitation infrastructure, as well as drainage channels. Drones will be used to accurately map specific communities and work with the communities and local students to geo-reference key community infrastructure and design contingency plans. Community consultation and surveys will be critical in this work to assess socioeconomic dynamics within different neighbourhoods. Localized charette workshops will be organised to inform the design of end-to-end early warning systems and preparedness plans that are responsive to community needs and societal structures, and strengthen existing community disaster risk management committees, where they already exist.</p>
Overall Budget	<p>Total Budget: US\$ 2 Million Component 1: Hydromet systems strengthening: \$750,000 Component 2: Disaster risk mapping: \$600,000 Component 3: Community early warning systems and preparedness planning: \$650,000</p>
Timeframe	<p>The program will run for 3 years. While activities will start immediately, sufficient time will be required to build the necessary partnerships and engage communities to leave a sustainable legacy.</p>
Partners	<p>Partnerships with local universities, civil society and community organisations will be a core element of this program. Engaging students and community members will allow for the program to develop maximum geographic coverage, while being cost effective and ensuring a strong capacity building legacy. Technology partnerships with organisations such as Flying Labs will be established to train a cohort of drone pilots to conduct high accuracy mapping that can be regularly updated at a low cost, with locally trained technical capacity. Such transferable technology skills will enable local communities and students to find jobs in a number of different sectors.</p> <p>The main Government counterparts for the program will include the Office of National Security (ONS), the National Meteorological Agency (NMA), the National Hydrological Agency (NHA), the Freetown City Council (FCC), the Western Area Rural District Council (WARDC), the Environmental Protection Agency (EPA) and the Directorate of Science, Technology and Innovation (DSTI) under the Office of the President.</p> <p>Meetings and workshops will be setup with key government and non-governmental counterparts to build consensus around a common vision for an enhanced hydromet and early warning system framework and operational modalities. Consultation meetings will be organized individually with all the key stakeholders and through technical committees and dissemination meetings.</p>

ANNEX 3 – Proposed Additional Financing for the CREWS West Africa Project

Country/Region	Sahel and West Africa (17 countries: Benin, Burkina Faso, Cabo Verde, Chad, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo)
Context	<p>The implementation of the CREWS West Africa regional project started in September 2018 and has received strong support for the Member States, in relation with consultations held for all its components and subcomponents namely:</p> <p>1.1 & 1.2 - Assessment of observation processes and needs / Database improvement (WACA&D)</p> <p>1.3 - Data base on impacts of Climate Extreme events (WACE)</p> <p>1.4 - Early warning system integration, operational procedures and seamless service delivery</p> <p>2 - Analysis and Climate Watch Services (WACWS)</p> <p>3 - Improved short- to medium-range forecast capabilities focusing on severe weather (SWFDP)</p> <p>4 - Flash Flood Forecast (FFGS)</p> <p>5.1 & 5.2 - Subseasonal to seasonal forecast (PRESASS)</p> <p>5.3 - Pilot drought services (AgM)</p> <p>In the meantime,</p> <ol style="list-style-type: none"> 1. AGRHYMET has initiated a process to become in the future the Regional Climate Center for CILSS, ECOWAS and PRESASS Member States, leading in additional resources requirements to ensure optimal use of weather, climate and water services in the region; 2. The regional specialised meteorological center in Dakar (RSMC Dakar, ANACIM) is facing difficulties in upgrading its high performance computer to serve the member countries with numerical weather predictions, thus compromising the expected results of the severe weather forecasting project supported by CREWS; 3. Chad and Togo are joining as CREWS beneficiary countries, resulting in a need to expand the coverage of services to

	<p>additional countries, including through flash flood guidance services;</p> <p>4. the preparation of the West Africa Regional HydroMeteorological Services Modernization Program Phase I by the World Bank is delayed, with Mali, initially part of this project, now being supported from the Strengthening Climate Resilience in Mali Project.</p> <p>The project at the regional level is complementing to the national projects in Burkina Faso (with WB investment), Chad (without WB investment), Mali (with WB investment), Niger (with WB and AfDB investments) and Togo (without WB investment). While provision of meteorological, hydrological, climate and early warning services is clearly a national responsibility, a number of support functions can be best performed at regional scale, with economies of scale and enhanced quality of services resulting for specialized regional cooperation, including for cascading approaches for numerical weather prediction (under the leadership of Dakar as regional specialised meteorological center), flash flood guidance (building upon enhanced numerical weather prediction capabilities and AGRHYMET training capabilities), climate watch and climate analysis (building upon ACMAD and later AGRHYMET as regional climate centers), training of meteorological and hydrological staff (with EAMAC and AGRHYMET, both in Niamey), etc.</p> <p>Following the meeting of the CREWS West Africa Steering Committee on 19 Dec 2018, it is proposing to scale-up the project from 1.8 million USD (see presentation note approved in Aug 2018) to 5.3 million USD.</p>
<p>Priority Needs</p>	<p>An additional financing of 3.5 million USD is requested to support:</p> <ul style="list-style-type: none"> - expansion of the direct support for West Africa Climate Assessment & Dataset (WACA&D), West Africa Climate Extremes database (WACE) and West Africa Climate Watch Service (WACWS) from 3 to 5 countries (500,000 USD allocated to date, +400,000 USD sought) - expansion of the flash flood guidance system FFGS from 3 countries to 17 countries (750,000 USD allocated from CREWS Burkina Faso and CREWS West Africa to date, + 1.2 million USD sought) - sustainability of Severe Weather Forecasting Demonstration Project (SWFDP), to enable participation of all PRESASS member states, and enhancement of Dakar Regional Specialized Meteorological Center (RSMC) Numerical Weather Prediction (NWP) capabilities (200,000 USD spent to date, + 1.9 million USD sought) - recommendation for a methodology for urban flood forecasting in West Africa (200,000 sought).

Overall Budget	USD 3.5 million (with USD 1.8 million already approved in August 2018, the total investment for CREWS West Africa will be increased to USD 5.3 million).
Timeframe	2019-2023
Partners	WMO (lead), WB (contributing), AGRHYMET, RSMC Dakar (ANACIM), Togo (DGMN), Netherlands (KNMI), Germany (DWD), USA (HRC, IRI), UK (Reading University) + NMHSs in 17 countries