

CREWS Pipeline Countries (as of December 2020)

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Benin	<p>A technical request from the Head of the National Meteorological Agency has been received. This provides an opportunity to initiate engagement.</p> <p>Disaster Risk Reduction Strategy is being developed and there is an ongoing discussion on possible transboundary cooperation with Niger. Further, a National Framework for Climate Services is developed and helped identify priorities to serve users and for advisory services.</p> <p>Benin needs to modernize its hydromet and climate service system and to continue building resilience to disaster and climate-related risks through: (i) enhancing provision of reliable and accessible weather and climate services; (ii) expanding hydro-meteorological services; (iii) tailoring hydromet information packages to decision makers; (iv) strengthening institutional arrangements and standard operating procedures; (v) establishing a legal framework to improve coverage of EWS; (v) supporting gender-mainstreaming in IDA- funded Hydromet project.</p> <p>Benin is one of the UNDRR selected coherence countries. In January 2020, UNDRR held a multi-country policy coherence peer learning exchange on DRR-CCA-SDGs in Niamey, Niger with participants from Benin. This peer learning exchange enhanced their knowledge on the convergences and differences among climate change adaptation and disaster risk reduction for operational purposes. The participants provided recommendations on how to increase policy coherence in the region, including the need to reinforce multi-sectorial coordination mechanisms, conducting comprehensive risk assessments, coherent investment and ensuring considerations of climate change adaptation and disaster risk reduction in recovery processes.</p> <p>The ministerial declaration adopted at the 2018 Regional Platform for DRR identified the urgent need to boost the development of effective impact based EWS for early action and transboundary risk management. Data and information available for this purpose are limited in Benin as well as in the entire African Region. There is an urgent need to systematize and harmonize the already available information and make it accessible to relevant stakeholders, according to their roles and responsibilities.</p> <p>The proposed activity will build on efforts undertaken in this country related to EWS and link it up to the continental impact-based EWS for early action and transboundary risk management, currently under development in cooperation with the African Union Commission (AUC), African Centre of Meteorological</p>

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	<p>Applications for Development (ACMAD), Regional Economic Commissions (RECs), African Member States and relevant implementing partners, including WMO.</p> <p>Accordingly, the activity will focus on:</p> <ul style="list-style-type: none"> • The review of the legal and institutional frameworks, ensuring the chain of responsibility from the generation of EW messages to their dissemination and the activation of mitigation measures is established and effectively working. • Establishment of the open-source web-based platform to exchange and analyze relevant DRR and EWS data to link the national EWS to the continental one. • Capacity building training for the exchange and use of data and information made available through the open-source platform. • Participation to joint training with AU, ACMAD, RECs and other Member States for the development of the continental EWS. • Participation to study visits, training and peer review to further enhance effectiveness of EWS, particularly in relation to the development of probabilistic risk scenarios in current and projected climate conditions, to inform impact based EWS for multiple sectors. • Participation in a network of community of experts to further improve modeling and impact—based forecasting capacities of national authorities, including for transboundary risk management. <p>Participation to the training for the generation/update/tuning of probabilistic risk profiles for impact based EWS for Early Action and Transboundary Risk Management.</p>
Bhutan	<p>Bhutan’s good performance provides high likelihood of success in delivery of expected outcomes. There is also ongoing WMO support through RIMES for climate service toolkits and this provides an opportunity to follow-up and scale up support to the Meteorological Service Agency.</p> <p>Bhutan will prioritize establishing end-to-end EWS in key flood affected dzongkhags in an inclusive and gender-sensitive way. Support will also be provided to strengthen capacity of key stakeholder agencies, enhance interoperability of its monitoring systems, improve forecasting capacity and flood risk knowledge and ensure dissemination and communication to affected Dzongkhags and Geogs.</p>
Ethiopia	<p>Needs in Ethiopia remain the same, however, now there is an opportunity to operationally engage.</p> <p>CREWS Ethiopia will support the development of climate services and impact based early warning systems aligned with the Ethiopia’s National Framework for Climate Services, ensure a seamless linkage between early</p>

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	warning information services and emergency preparedness and response, strengthen the communication link between the providers and the local users, and enhance the capacity of users to understand, utilize and act on climate and early warning information products in a gender-inclusive manner.
Malawi	<p>In Malawi the WB team is supporting the department of climate change and met services with a reliable on ground monitoring network and on semi-automatizing basic recurrent processes of daily and weekly forecasting. CREWS support would build on these modernization advances to develop more reliable tools, end-user services and early warning functions, in line with the National Met Policy. There is now an operational opportunity to engage. Ongoing investments and policy level engagement can be leveraged. There is sufficient human resource capacity in the field, ongoing project that can be built on (WMO-NORAD project) and coordination with UNDP, DRR agencies and stakeholders are ongoing.</p> <p>FOCUS Africa (Met Office component) - Develop climate services in the Southern African Development Community region in four key sectors: agriculture and food security, water, energy and infrastructure. 8 case studies in six countries (Zambia, South Africa, Tanzania, Malawi, Mauritius, Mozambique). The case studies will illustrate how the use of climate science, forecasts and projections can maximize socio-economic benefits in the Southern Africa region and potentially in the whole of Africa.</p> <p>(WMO) The Norway funded project “Climate Services Adaptation Programme in Africa: Malawi & Tanzania” was the first multi-agency initiative to be implemented under the Global Framework for Climate Services. This flagship Programme helps develop user-driven climate services for food security, health and disaster risk reduction in Malawi and Tanzania. Funded by the Government of Norway, the Programme increases the resilience of people most vulnerable to the impacts of weather and climate-related hazards such as droughts and flooding and associated health risks including malnutrition, cholera and malaria. It also aims to strengthen the capacity to develop and use climate services as well as combine cutting-edge science with traditional knowledge. It represents a unique partnership between climate and social scientists, researchers, development and humanitarian agencies and other key user sectors.</p>
Niger	Support will continue to build on recent efforts undertaken by UNDRR in Niger. In January 2020, UNDRR held a multi-country policy coherence peer learning exchange on DRR-CCA-SDGs in Niamey, Niger. This peer learning exchange enhanced their knowledge on the convergences and differences among climate change adaptation and disaster risk reduction for operational purposes. They provided recommendations on how to increase policy coherence in the region, including the need to reinforce multi-sectorial coordination mechanisms, conducting

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	<p>comprehensive risk assessments, coherent investment and ensuring considerations of climate change adaptation and disaster risk reduction in recovery processes. Through this process, capacities were built in Niger to enable the integration of CCA into the DRR strategy.</p> <p>The ministerial declaration adopted at the 2018 Regional Platform for DRR identified the urgent need to boost the development of effective impact based EWS for early action and transboundary risk management. Data and information available for this purpose are limited in Niger as well as in the entire African Region. There is an urgent need to systematize and harmonize the already available information and make it accessible to relevant stakeholders, according to their roles and responsibilities.</p> <p>The proposed activity will build on efforts undertaken in this country related to EWS and link it up to the continental impact-based EWS for early action and transboundary risk management, currently under development in cooperation with the AUC, ACMAD, RECs, African Member States and relevant implementing partners, including WMO.</p> <p>Accordingly, the activity will focus on:</p> <ul style="list-style-type: none"> • The review of the legal and institutional frameworks, ensuring the chain of responsibility from the generation of EW messages to their dissemination and the activation of mitigation measures is established and effectively working. • Establishment of the open-source web-based platform to exchange and analyze relevant DRR and EWS data to link the national EWS to the continental one. • Capacity building training for the exchange and use of data and information made available through the open-source platform. • Participation to joint training with AU, ACMAD, RECs and other Member States for the development of the continental EWS • Participation to study visits, training and peer review to further enhance effectiveness of EWS, particularly in relation to the development of probabilistic risk scenarios in current and projected climate conditions, to inform impact based EWS for multiple sectors. • Participation in a network of community of experts to further improve modeling and impact — based forecasting capacities of national authorities, including for transboundary risk management. • Participation to the training for the generation/update/tuning of probabilistic risk profiles for impact based EWS for Early Action and Transboundary Risk Management.
Senegal	There is huge presence in the field with sufficient human resource capacity. The Senegal Meteorological Agency is also an accredited regional resource center of WMO and supports African states in severe weather forecasting.

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	<p>In Senegal, the WB team is preparing an emergency flood management project to address the catastrophic effects of recent flooding in Dakar and secondary cities. To complement infrastructure investments for flood reduction, the project includes a subcomponent on Integrated Early Warning Systems (IEWS) that aims to strengthen the institutional capacity of Hydromet service providers and first responders (e.g., the Central Emergency Preparedness and Response actors, the National Emergency Operation Center and local authorities) as well as the local capacity of exposed communities to reduce their vulnerability. In that sense, the IEWS is critical to providing adequate climate services (e.g., forecasts and early warning information communicated in accessible language) and to facilitate the early actions of both first responders and affected populations (e.g., contingency plans, community-based interventions, etc.). The IEWS is also deemed instrumental in supporting the operations and maintenance of the built stormwater drainage systems as it will contribute to the long-term urban resilience of Dakar and select secondary cities. The support from CREWS is fundamental to provide further technical assistance for the design and implementation of the IEWS, scale up workshops on community participation and gender and to promote knowledge exchange on best IEWS practices from previous and ongoing experiences in the region.</p> <p>SWIFT (Met Office) - Make research advances needed for significant improvements in weather forecasts in Africa, and the tropics more generally, from the hourly to the seasonal timescale. II. Build capability among UK and African partners to improve, maintain and evaluate operational tropical forecasts in future. III. Assist African partners in developing capacity for sustained training of forecasters, in partnership with African academic institutions and international agencies</p>
Central-Africa region	<p>The engagement can build upon the ongoing WMO regional project funded by the European Union through the African Development Bank. The CREWS support can help fill in the gaps/missing elements on severe weather forecasting.</p> <p>This project would build upon the basis of a Central Africa regional climate center (RCC) installed by the EU-AFDB SAWIDRA project in Douala, and would develop regional cooperation for additional areas such as severe weather forecasting (potentially from Dakar RSMC), training for meteorologists and hydrologists, instrument calibration and maintenance, meteorological and hydrological data exchange, etc.</p>

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Central African Republic	<p>A World Bank investment request was submitted to the Board and depending on resource availability can be scaled-up with CREWS support.</p> <p>CAR is seeking to improve its Hydromet and climate services through the establishment of a functional flood EWS in selected watersheds. CREWS CAR will also support the strengthening of institutional capacity through technical assistance to key Hydromet service providers and end-users. The TF will also support the establishment of a drought forecast-based financing, an early action mechanism to deal with the prevailing drought events in the north and northeast parts of the country and to minimize its impact on agriculture, food security, livestock among others. An investment/funding will be sought to support the financing component of the Drought FbF mechanism and the acquisition of selected observation equipment.</p>
East Africa Region	<p>WISER 1 & 2 (2016-2021) (Met Office) has been designed to enhance the resilience of poor people and economic development in Africa. Through improving the generation and use of weather and climate information services, decision making (to prepare for the impacts of weather) would be enhanced at the household, community, sectoral, national and regional levels. The WISER component led by the Met Office has been focusing on East Africa. Several of the WISER projects have worked to enhance the early warning services in East Africa, including MHEWS in Tanzania, HIGHWAY in the Lake Victoria Basin and the National project in Rwanda.</p> <p>WISER 2's headline results (Met Office and ACPC component) will be</p> <ul style="list-style-type: none"> • At least 24 million people receiving climate and weather information services by 2030 • 1.6 million people benefitting from reduced impact of weather-related disasters • Economic benefit of over £190 million in terms of avoided damages between 2015 and 2030 <p>A benefit: cost ratio of between 3:1 and 6:1 (DFID, WISER Annual Review 2019)</p> <p>In 2015, FCDO launched the Weather and Climate Information Services for Africa (WISER) programme. This programme aims “to make a step change in the quality, accessibility and use of weather and climate information services at all levels of decision making for sustainable development in Africa.” Phase 2 of the WISER programme is coming to a close in East Africa. To continue maximizing the impacts of weather and climate projects in East Africa, WMO proposes an East Africa CREWS project to provide advisory services to national services as well as development partners, including the CREWS IPs, and ensure optimal use of funding for early warning systems in the region, while improving regional cooperation within East African States.</p>

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	<p>The East Africa Community Member States have recently endorsed the Regional Early Warning System Vision 2025 developed through the HIGHWAY Project, which is part of the wider FCDO supported WISER Programme. The project strengthened the effectiveness and sustainability of the existing institutional framework for the regional Early Warning System and increased access to operational data sources, co-produced impact based early warning systems (IBEWS) and enhanced communication to end users, significantly increasing uptake and use. To achieve Vision 2025, further work will be undertaken to roll out the new IBEWS to users across the LVB, replicate the successful co-production methodology in other EAC nations (South Sudan, Burundi) who were not part of the previous project, and support the implementation plan for the Regional EWS Vision developed as part of the HIGHWAY project.</p> <p>FCDO funded Kenya AMDAR is a WMO-led Public Private Partnership between the Kenya Meteorological Department (KMD) and Kenya Airways (KQ) for the establishment and operation of a meteorological observing program facilitating the automated reporting of meteorological atmospheric information from a fleet of aircraft.</p> <p>The AMDAR program uses the aircraft’s existing sensors, avionics and telecommunication systems to gather, process, and disseminate data. The data is used directly by KMD to improve the accuracy of weather forecasting services to aviation and public weather applications that meet sector-specific needs. The project also brings wider benefits to Kenya, the African continent and the global community through the positive impact of the use of data in applications associated with climate monitoring and prediction, environmental protection, agriculture, health, and disaster risk reduction.</p> <p>Agricultural Climate Resilience Enhancement Initiative (ACREI) : 6.8M USD Adaptation Fund project in East Africa, working with ICPAC, FAO, WMO, and met services in Ethiopia, Kenya and Uganda. Project aims to to develop and implement adaptation strategies and measures that will strengthen the resilience of vulnerable smallholder farmers, agro-pastoralists and pastoralists in the Horn of Africa to climate variability and change. The overall objective of the project is to improve adaptive capacity and resilience to current climate variability and change among targeted farmers, agro-pastoralists and pastoralist communities.</p>
Malawi, Mozambique and Tanzania	The ministerial declaration adopted at the 2018 Regional Platform for DRR identified the urgent need to boost the development of effective impact based EWS for early action and transboundary risk management. Data and information available for this purpose are limited in Malawi, Mozambique and Tanzania as well as in the entire

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	<p>African Region. There is an urgent need to systematize and harmonize the already available information and make it accessible to relevant stakeholders, according to their roles and responsibilities.</p> <p>Institutions involved in early warning in Malawi are involved in numerous projects, and mechanisms for data sharing and decision making are very much needed. Moreover, resources and technical capacities for data management and modelling are limited. Ongoing activities implemented by UN agencies and other stakeholders strive to address these challenges. UNDRR has analyzed what EWS mechanisms exist in Malawi. Exchanges with partners working in Malawi suggest that data is scarce and scattered across various institutions. Forecasting and modelling are mainly undertaken drawing upon global data as local instrumentation is not fully operational either because of poor maintenance or lack of constant internet.</p> <p>UR Tanzania is one of the core authors of the <u>Africa Road Map for Improving the Availability, Access and Use of Disaster Risk Information for Early Warning and Early Action, including in the Context of Transboundary Risk Management</u>. Risk knowledge, in its quantitative aspect, is not fully considered in the preparedness actions and in the preparation of emergency plans and therefore, it is recommended to consider this quantitative aspect when developing the emergency plans. Warning messages are only loosely connected with impact scenario descriptions, which results in actions recommended to the population being too general. A closer connection between the severity of the forecasted event, its impact and the actions recommended at different levels, from the civil protection system, down to the population should be sought. The country should also complete flood/drought hazard, vulnerability and risk mapping for the whole territory to identify threats and potential consequences and consolidate risk information to support preparedness plans UR Tanzania should aim at improving the monitoring and forecasting services by increasing the use of automated measurement stations. Dissemination and communication of warnings should be improved. UR Tanzania should aim at improving the operational capacity of the Emergency Operations Centre that should provide a 365/24/7 service implementing fail-safe systems and standardized procedures for the issuing of warnings.</p> <p>The proposed activity will build on efforts undertaken in this country related to EWS and link it up to the continental impact-based EWS for early action and transboundary risk management, currently under development in cooperation with the AUC, ACMAD, RECs, African Member States and relevant implementing partners, including WMO.</p>

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South-Asia sub-region, covering Bhutan, Nepal and Maldives	<p>South Asia is exposed to a variety of hazards from avalanches and earthquakes to glacial lake outburst floods (GLOF), drought, floods, and cyclones. It is home to nearly a quarter of the world's population, who are increasingly living in dense urban areas. Most importantly, many countries in the region share common geological formations and river basins, and natural hazards frequently transcend national boundaries. WMO has been engaged through various initiatives/forums in the region such as the Tropical Cyclone Programme, the Severe</p>

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	<p>Weather Forecasting Programme (SWFP-South Asia), South Asia Flash Flood Guidance System, Pakistan and Afghanistan Regional Flash Flood Guidance System (PARFFGS), South Asia Climate Outlook Forum, HydroSOS pilot studies across the Ganges-Meghna-Brahmaputra basin, to name a few. The region still faces immense challenges, which require a range of options to strengthen regional cooperation for resilience. Some key elements to be addressed include:</p> <ol style="list-style-type: none"> 1. Improve the potential of regional cooperation 2. Capitalize on existing initiatives and deploy new technologies, including the seamless integration of various systems 3. Implementation of risk-informed policies and investments <p>There is opportunity to take advantage of data exchange cooperation and support its improvement. The focus can be on regional centers not performing optimally.</p> <p>Support for overall coordination between meteorological office and NDMOs, improving risk knowledge (disaster loss data and improved vulnerability assessment to enable Impact-Based Forecasting, inclusive (gender and disability inclusive risk communication) and preparedness-early action can be provided.</p> <p>(Met Office) The FCDO ARRCC programme has a focus on South Asia, including Nepal. The Impact based forecasting Work Package is working with the Department of Hydrology and Meteorology (DHM) and the National Disaster Risk Reduction Management Authority (NDRRMA) in Nepal on an IBF pilot. The IBF pilot should focus on rainfall as the hazard and landslide as the impact. The pilot will focus on municipalities within the Sindhupalchok and Baglung Districts and the Karnali river basin, which encompass both earthquake and non-earthquake impacted areas. ARRCC is also working with Red Cross Climate Centre to support training and national dialogue platforms in Bangladesh, as well as CIMMYT to trial wheat rust / wheat stripe model in Nepal (and Bangladesh).</p>
Additional Caribbean	<p>Additional financing to support the use of expertise of UNDRR within the current project in order to”</p> <ul style="list-style-type: none"> - Strengthen the capacity of the Impact-Based Forecasting roles and responsibilities between national and regional stakeholders’ - Ensure alignment of the CREWS MHEWS strategy with the different National DRR strategies; - Secure coherence and synergies between the CREWS MHEWS strategy with those existing or under development for other non-climate related EWS (e.g. geohazards, biohazards, etc);

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	<ul style="list-style-type: none"> - Strengthen the focus on the most vulnerable by ensuring the sustainability of the inclusive approach and people-centred EWS; - Increase the understanding of communities and individuals' perceptions concerning the way how warnings are being delivered and received, as well as, about the different actions that communities are implemented upon reception of the warning; - Strengthen private sector's role in EWS, through ARISE and CARICHAM networks as institutionalized anchors, including the promotion of private sector investments in EWS; - Work with regional stakeholders for learning co-generation and knowledge sharing, through collection and dissemination of evidence, including analysis of challenges, lessons learned and best practices.