

CHAD Project Proposal

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| Project Title | <i>Chad Hydromet and Early Warning Services</i> | | | | | | | |
| Project Reference | CREWS/CProj/11/Chad | | | | | | | |
| Geographic coverage | <i>Chad</i> | | | | | | | |
| LDC and/or SIDS profile | Level of Disaster Risk | High | Average annual loss to disasters | Flood AAL: US\$38.75M Drought AAL: US\$38.92M (EM-DAT) | Access to information & communications (ICT index) Ranked 174 th in the ITU's ICT Development index | | Capacity of NMHS Very Low | |
| | Status of hydromet and EWS | Poor | Disaster loss and risk data to inform early warning | 2.4 million people are exposed to drought risk. Estimated damage and losses from flood event in 2012 were US\$24M | Demand/Priority High | | Leveraging potential High from WBG and GCF | |
| Timeframe | <i>5 Years</i> | | | | | | | |
| Total cost of CREWS Contribution | <i>US\$ 3,150,000</i> | | | | | | | |
| Lead Implementing Partner | <i>The World Bank</i> | | | | | | | |
| | a. Allocation requested for execution by Government | Only in kind | | | | | | |
| | b. Allocation requested for execution by Partner | US\$ 1,500,000 | | | | | | |
| | c. Fees of Implementing Partner | 150,000 | | | | | | |
| | d. Total | US\$ 1,650,000 | | | | | | |
| Additional Implementing Partner | <i>WMO</i> | | | | | | | |
| | a. Allocation requested for execution by Partner | US\$ 1,327,000 | | | | | | |
| | b. Fees of Implementing Partner | US\$ 173,000 | | | | | | |
| | c. Total | US\$ 1,500,000 | | | | | | |
| Other Partners | <i>[Other partners involved in the project implementation and/or contributing funds]</i> | | | | | | | |
| | Financial Contribution | | | | | | | |
| | Form of Contribution | | | | | | | |
| Project Recipient/Beneficiary | <i>ANAM, DRE, ANADER, SISAAP, DGPC</i> | | | | | | | |
| | Form of Contribution | | | | In kind | | | |
| Total Project Amount | <i>US\$ 3,150,000</i> | | | | | | | |
| Main objective(s) | <p>To support the strengthening of national capacity to deliver climate, hydrometeorological and early warning services in selected sectors and communities.</p> <p>CREWS resources will contribute to the improvement of the Government of Chad's early warning services for drought, flooding and other severe climate and weather-related events by enhancing the capacities of national services in charge of meteorology and climate, hydrology, civil protection, and food security and piloting selected products, which could be replicated and scaled up by larger investment projects. To this scope, CREWS resources are intended to leverage additional financing in the area of hydromet and early warning systems by development partners, such as the World Bank Group, the Green Climate Fund and others</p> | | | | | | | |

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| | | <p>from within the Africa Hydromet Program.</p> <p>More specifically, CREWS financing will provide scientific and technical advice for the modernization of hydromet and early warning services in the country, including support to strengthening forecast capacities, dissemination of flood and drought alerts and emergency planning and response. The project will also focus on capacity building, community engagement and gender inclusion of vulnerable population in areas prone to flash-floods and agricultural drought.</p> |
| <p>Initial state of play - project rationale</p> | <p>a. Vulnerability, exposure to risks, disasters impacts (on people and economy)</p> | <p>Chad is frequently affected by a range of hydro-meteorological and climatological disasters, notably floods and droughts (including poor distribution of rains, late rains). One of the major sectors of the economy is agriculture, which employs more than 80% of the workforce and accounts for 21% of the GDP. Over the last years, repeated droughts have had substantial impacts on Chad’s agricultural production and have affected up to 2.4 million people. Persistent drought has also aided in the acceleration of desertification in the northern part of the country, causing agro-pastoral areas to decline and livestock grazing areas to shift further south. Floods are a recurring natural hazard in Chad that may become worse with climate change. The country has a high prevalence of endemic diseases such as malaria, and suffers from epidemics of cholera, measles, and meningitis. Chad has also experienced the drying of rivers and lakes in recent years, most notably of Lake Chad. Climatic forecasts by NASA have indicated that Lake Chad could disappear in 20 years at the current rate of water use and increased silting of upstream rivers.</p> <p>Climate change threatens to aggravate endemic diseases through extreme events, increasing the population’s susceptibility to them. Early warning systems as well as better quality medical care are necessary for disaster risk management.</p> <p>Agricultural production, livestock farming, and fishing all rely heavily on freshwater resources in Chad and the need for better management of these resources is necessary for the future. Climate change will aggravate the human pressure already on these systems and better management is needed to ensure Chadians have access to freshwater resources.</p> |
| | <p>b. Status of the EWS, DRM agencies and NHMSs, actors / players present</p> | <p>From a user perspective, currently the country’s capacity for early warning system can be improved in many ways. At the moment, the country does not issue any official severe weather warnings. Flood forecasting is currently being conducted in a pilot stage. However, more can be done, which leaves enormous potential for diminishing the loss of lives, livelihoods and assets.</p> <p>Similarly, seasonal forecasts and planting and harvesting advisories could be significantly improved to enhance the productivity of farmers. A food security system in the country does exist, and already functions, however, it could also be improved.</p> <p>Hydrological and meteorological activities are carried out by three structures (i) National Agency of Meteorology (ANAM), (ii) Directorate of Water Resources (DRE), and (iii) Representation of ASECNA in Chad. Coordination remains a challenge. There are clear opportunities to develop the use of hydrological and meteorological services to save lives and protect livelihoods and assets in the country. Similarly, agriculture and civil protection sectors will benefit from adequate hydromet services. Furthermore, potential business opportunities will arise in the energy and land transportation sectors.</p> |

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| | <p>Most of early warning resources are currently concentrated in the food security and nutrition domain, under the Food Security Information and Early Warning System (SISAAP).</p> <p>Most agencies involved in the Early Warning value chain are impeded by critical weaknesses and limitations in funding, equipment, skills, and human resources. Currently, all involved actors are part of a Steering committee that meets regularly to discuss the weather forecast before its dissemination. The process for collecting some data involves local populations through the support of the National Agency for Rural Development (ANADER) in collaboration with ANAM.</p> <p>One major challenge for the country is related to the current state of the Civil Protection Directorate (DGPC), which has no resources to implement a wide range of Early Warning services or response to emergency.</p> |
| <p>c. Projects and programs dealing with EWS and hydromet under implementation or preparation</p> | <p>Several technical assistance activities have been rolled out in support of flood risk management and early warning systems in Chad, from both implementing partners of this proposed project and others. Under the WMO's METAGRI project (2012-2015), 16 roving seminars were held training farmers on the use of weather and climate information.</p> <p>The WBG is implementing a number of Regional projects that include Chad, with a strong focus on resilience to climate change (i.e. Building Resilience through Innovation, Communication, Communication and Knowledge Services (BRICKS), Climate Resilient Agriculture and Productivity Enhancement (PRAPS), etc.). Although these projects do not have specific outputs related to early warning systems, they aim to produce climate related information that will support the development of hydromet modernization programs and EWSs.</p> <p>In addition, other development partners are involved in various projects including AFD (Flood Prevention), IFAD (Project to improve the Resilience of Agricultural Systems), EU (MESA, ECOAGRIS), AfDB (Food Security – P2RS), and the Government of Chad (OPEN).</p> <p>In terms of potential pipeline investment, the WBG is currently in discussions with the Government of Chad for a climate resilience investment focusing on hydromet and early warning systems modernization. Hydromet and EWS are investment priorities in the Region for the World Bank, which have been lately confirmed in the Action Plan for Climate Adaptation and Resilience (https://www.worldbank.org/en/news/press-release/2019/01/15/world-bank-group-announces-50-billion-over-five-years-for-climate-adaptation-and-resilience). The CREWS project will act as a vehicle for capital mobilization in the sector, creating favourable baseline conditions, knowledge and pilot activities which could be transferred and scaled up by larger-scale investments, not only from the WBG but also from other development partners such as the Green Climate Fund.</p> |
| <p>d. Describe the multiplier /leveraging potential of the CREWS investments</p> | <p>CREWS' technical support will help leverage investment financing aiming at strengthening climate, hydrological and meteorological services to improve forecasting, early warning and disaster response systems. Specifically, CREWS will focus on developing capacities among stakeholders involved in early warning (civil protection, agriculture and targeted communities at risk) in line with the national framework for</p> |

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| | | <p>climate services adopted in 2013 by the Government of Chad and based on detailed requirements and feedback from user groups. There is therefore an excellent opportunity that the CREWS resources would help inform the technical design of future investments but also build capacity with involved institutions to take full advantage of future system improvements. The combination of technical assistance from CREWS and future investments in the sector will increase the chances for Chad to make significant advances in the provision of modernized early warning systems to vulnerable communities.</p> <p>CREWS funding will also help the Government of Chad to seek additional funding for hydromet and EWS modernization, such as from the Green Climate Fund.</p> <p>The CREWS project will also facilitate coordinated interventions from other donors to maximize opportunities and synergies. For instance, the proposed activities of this grant contribute to develop adaptive capacities at community level. Much is needed to target the improvement of hydro-meteorological information and warning systems with end-to-end connectivity. Adaptation capacity and resilience at user's level plus technical support to NMHS will help closing the gap between producers of data/information and users of these services/alerts to reduce climate and disaster risk vulnerability of communities.</p> |
| | <p>e. Describe measure to ensure coherence with existing initiatives</p> | <p>Coherence with existing initiatives will be assured by close support and on-the-ground work with relevant institutions. Over the last months task teams have worked closely with all beneficiaries and understand limitations, gaps, needs and opportunities. Chad is making significant efforts toward coherence interventions in the sector, by setting up a multi-agency steering committee involving all relevant institutions. The first phase of the project will involve a SWOT-like analysis of the Steering Committee to confirm bottlenecks and opportunities. An integrated approach will be adopted to make sure that various institutions contribute to the design of interventions keeping in mind end users and beneficiary sectors.</p> <p>Coherence will also be dictated by consultations and citizen engagement.</p> <p>A mapping exercise will be undertaken further to identify future initiatives and prevention of duplications.</p> |
| <p>Project design</p> | <p>a. Project components and activities</p> | <p>Component A. Strengthening Hydrological and Meteorological Services</p> <p>(a) Provision of scientific and technical advice to the meteorological and hydrological services (with ANAM and DRE) for feasibility studies, quality management framework (QMF), diagnostics, training plans, identification of technical specifications for equipment and organization of services - US\$300,000 (WMO)</p> <p>(b) Support to climate watch service for (i) enhanced seasonal and sub-seasonal forecasting and decision support for agriculture and pastoralism (ii) forecasting of flood duration with a focus on selected pilot area - US\$200,000 (WMO)</p> <p>(c) Support the design and carrying out of piloting products for EWS for flood and food security in a selected area (possible location to be confirmed is the Junction of Chari and Logone rivers). This activity will include upstream information on hydrometeorology and agrometeorology - US\$200,000 (WMO)</p> |

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| | | <p>(d) Support to the development of a capacity building plan and carrying out of trainings (in partnership with one of the regional or global centres, such as CILSS/AGRHYMET, EAMAC, U. of Lomé, WASCAL) focusing on, inter alia: (i) Climate prediction, (ii) Hazard detection, monitoring, forecasting and warning, (iii) Multi Hazard Early Warning Systems, (iv) Flood forecasting, (v) Climate data management (calibration, concentration, quality-control) from remote sensing and in-situ networks, (vi) GIS and remote sensing, (vii) operational meteorology and hydrology, refresher course for field observers, (viii) radar operation and maintenance (if needed on the 4 radars available in the country and to be installed)- US\$ 300,000 (WMO)</p> <p>(e) Direct support (transfer of funds to beneficiaries through ANAM) to project beneficiaries for small equipment, missions, workshops, recruitment of a project manager – US\$327,000 (WMO)</p> <p>(e) Undertake a capacity assessment, strategic development and business development plan for integrated hydromet services, with a specific focus on sustainability and inter-ministerial coordination - \$100,000 (WBG)</p> <p>Component B. Strengthening of end user’s capacity for service delivery and pilot activities</p> <p>(a) Design and carry out Technical assistance for Civil Protection Directorate and Food Security Early Warning Systems. The capacity assessment will help identify the specific needs for technical assistance for contingency and emergency planning as well as response mechanisms - \$300,000 (WBG)</p> <p>(b) Support the design and carrying out of piloting products for EWS for flood and food security (possible location to be confirmed is the Junction of Chari and Logone rivers). This will also include targeted activities related to advisory services to the benefits of crop producers and support to community engagement and gender for DRR (flood community mapping, awareness campaigns, gender groups, etc.). ANADER has an active network engaging local communities (community and regional level associations – CDA, CRA). Assess their limitations and explore way to expand their efforts in a systematic manner - \$800,000 (WBG)</p> <p>(d) Institutional support and training in contingency planning of DGPC and other civil protection stakeholders, including simulation exercises with selected communities. This task consists of the development of a training program on disaster risk reduction with emphasis on early warning, targeted public education and awareness programs for warning systems and related public actions, and the organization and implementation of frequent simulation exercises in selected areas - US\$ 300,000 (WBG)</p> |
| | b. Logical framework and work plan | See attachments 1, 2, 3 |
| Organization and operating procedure | a. Institutional framework | The CREWS financing would be implemented by the World Bank and WMO. At the national level, the National Steering Committee (NSC) will be responsible for overseeing the project implementation. The |

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| | | NSC, chaired by a representative from the Ministry of Aviation, will be composed of representatives from line ministries involved in planning, meteorology, hydrology, agriculture, water resources. The NSC will function during the full project implementation period and will meet at least twice a year. The role of the NSC will be to provide overall oversight, policy direction on project implementation resolving any policy hurdles or policy conflicts and supporting project risk management |
| | b. Monitoring and evaluation system | The continuous monitoring of the project and its achievements would be the responsibility of the World Bank with inputs from WMO and the NSC. The M&E system will be a result-based framework, conceived as a management tool, emphasizing project impacts and outcomes, as well as regular monitoring of inputs and outputs. For the purposes of transparency, part of this database will also be available from the project website to regularly share information with the public, and this information will be shared with communities by dedicated communication teams. |
| Project viability and sustainability | a. Main identified risks | The main project risks are related to the limited financial operating environment (including budgets for operation, maintenance, recruitment and training) and overall limited technical capacity of the NMHS institutions, in addition to the baseline conditions of these institutions. The CREWS initiative aims to increase the visibility and relevance at national level of agencies involved in the project, particularly ANAM and DRE, DGPC and SISAAP, by strengthening their capacity to deliver useful services for the general public, productive sectors (agriculture) and vulnerable communities. This will be realized by focusing on a pilot area where improved early warning services will be supported. The overall goal is to showcase how enhanced services can produce wider benefits, hence leading to increased national interest and budgetary allocation. Increased budgetary allocation will also improve the overall sustainability of hydromet and early warning systems on the longer run, after project completion. In order to mitigate risks, the project will draw on lessons learnt from similar projects in the area (Mali, Niger, DRC, Burkina Faso) and draw as much as possible from experience and structure of existing national engagements in Chad, including from social protection. The project will collaborate and coordinate with active projects to avoid duplication and overlap and capitalize on experiences of closed projects. CREWS will support technical assistance and training for identified gaps in knowledge and practices related to the project's objectives. |
| | b. Critical assumptions | The project was prepared under the assumption that support to some basic services will be provided at a national level (seasonal and daily forecasting, ten-day agro-meteorological reports, etc.). Support to more specialized services (such as flood forecasting systems, personalized agro-meteorological information services, warning reports to anticipate impacts, etc.) will be provided to selected zones to be identified based on the following criteria: (i) presence of specific hydro-meteorological natural hazards; (ii) exposure of populations and critical infrastructures (urban zones, roadblocks, irrigation, transport, hospitals, schools, etc.); and (iii) presence of other investment projects, which would allow for an optimal utilization of hydro-meteorological services (notably towards crop producers, livestock herders, fishermen, hydropower generators, aviation and other transport related sectors, extractive industries, local government, micro-insurance and urban planners). |
| | c. Judgment on the | Most agencies involved in hydromet services and early warnings are |

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| | project sustainability | <p>limited by critical weaknesses and low level of funding, equipment, skills, and human resources. The project will support the Government institutional effort for inter-ministerial coordination through the Steering Committee, by providing capacity building and pilot sites where improved services will reach selected sectors and communities. Chad requires large investments to modernize its hydromet and early warning systems. The CREWS project will act as a vehicle for capital mobilization in the sector, creating favourable baseline conditions, knowledge and pilot activities which could be transferred and scaled up by larger-scale investments. CREWS funding is intended to leverage additional investments in the sector, primary by the WBG and the Green Climate Fund but also from other development partners part of the Africa Hydromet Program. Moreover, the project will allow national counterpart to showcase enhanced services in selected pilot areas, that could lead to the increase of their national budgetary allocation. Increased budgetary allocation will also improve the overall sustainability of hydromet and early warning systems in the longer term, also after project completion.</p> |
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Attachment 1: Hydromet and Early Warning Services – Timeline for implementation

| TASK | y1 | | | | y2 | | | | y3 | | | | y4 | | | | y5 | | | |
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| | Q 1 | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q 4 | Q 1 | Q2 | Q 3 | Q 4 |
| COMPONENT A. HYDROLOGICAL AND METEOROLOGICAL SERVICES | | | | | | | | | | | | | | | | | | | | |
| WMO - Provision of scientific and technical advice | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| WMO - Climate watch service | | | | x | x | x | x | x | x | x | x | x | x | | | | | | | |
| WMO – Pilot products for EWS (upstream information) | | | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | |
| WMO – Capacity Building | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| WMO – direct support to project partners (fund transfer) | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| WB – Capacity assessment and strategic planning for all 4 institutions | | x | x | x | x | x | | | | | | | | | | | | | | |
| COMPONENT B. CIVIL PROTECTION, EMERGENCY MANAGEMENT AND DISASTER RISK REDUCTION | | | | | | | | | | | | | | | | | | | | |
| WB – Technical assistance for civil protection Directorate and food security early warning systems | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| WB – Pilot products for EWS (downstream/ end users services) | | | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | |
| WB – Community engagement activities | | | | | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| WB – Capacity Building | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | |

**Attachment 2: Chad Hydromet and Early Warning Services
Contribution to CREWS Programming Framework**

| Result Level | Indicators | Baseline | Target |
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| To significantly increase the capacity to generate and communicate effective impact-based multi-hazards early warning systems and risk information to protect lives, livelihoods, and assets in LDCs and SIDS (SFDRR Target G) | # of people covered by multi-hazard early warning system, disaggregated by gender (subset of proposed SFDRR Indicator G-3) | 0 | TDB based on selected pilot area (after 6 months of project starting) |
| Increased accuracy and timeliness of weather forecasts and early warning | # of countries demonstrating increased accuracy and timeliness of weather forecasts and early warning | 0 | 1 |
| National and local agencies provide better early warning and respond more effectively when hazards occur | # of countries with improved institutional capacity in the use of disaster risk information for early warning and contingency planning | 0 | 1 |
| Improvement of NMHSs' service delivery | average increase in WMO Service Delivery Progress Model (SDPM) level across CREWS countries | 0 | 1 |
| Assessment of institutional capacities of NMHSs, user needs, on-going and planned programs, and socioeconomic benefits of hydromet services and early warning | # of national capacity assessments | 0 | 4 |
| Production of hazard and risk information of exposed populations and assets | # of national risk assessments | 0 | 0 |
| Development of long-term service delivery strategies and development plans for NMHSs, Civil Protection | # of NMHS service delivery strategies and development plans % of new NMHS service delivery strategies and development plans that include specific gender provisions | 0 | 3 |
| Development of preparedness and response plans with operational procedures for early warning dissemination | # of national plans developed % of new national plans that include specific gender provisions | 0 | 1 |
| Design and implementation of targeted education and public awareness campaigns | # of people reached, disaggregated by gender | 0 | 20,000 (50%) |
| Travel (of clients for training, study tours, etc.) | # of people trained abroad, disaggregated by gender | 0 | 15 |

Attachment 3: Chad Hydromet and Early Warning Services
Logical framework with indicators

| Indicator | Means of Verification (MoV) | Baseline | Target | |
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| | | | Mid-term (if applicable) | Final |
| Operational procedures and MoUs supporting early warning | Project reports reflecting the existence of new or updated procedures, their availability, and their operational implementation | 0 | 1 (meteo) | 3 (meteo, hydro, civil protection) |
| Direct project beneficiaries (number), of which female (percentage) | Estimates in project reports based on geographical coverage and outreaching | 0 | TBD based on pilot area (50%) | TBD based on pilot area (50%) |
| Number of professionals having participated in trainings | Tracking from participation sheets in project reports | 0 | 40 | 120 |
| National capacity assessments and strategic development plan for NHMS | Updated report finalized reflected in the project reports | 1 (2010) | 2 | 2 |
| Increased satisfaction of selected sectors and communities in pilot area(s) with improved services in flood and drought EWS | For sectors: Regular consultations with key stakeholder For Communities: (1) Public surveys conforming with WMO methodologies, disaggregated where possible for gender and vulnerable groups. (2) Direct feedback from users through ANADER, SISAAP, DGPC | 0 | 30% | 50% |
| Number of climate-related hazards for which warning or monitoring forecast bulletins are operationally produced with sufficient lead-time for preparedness and early response | Verification of the existence of operational procedures and their implementation. | 0 | 1 (flooding) | 3 (drought, flooding, and severe weather) |
| Number of user groups having expressed their needs and developed a resulting action plan to address them | Annual report reflecting the needs of user groups | 0 | 1 (civil protection) | 3 (among civil protection, municipalities, agriculture aeronautic transportation , hydropower) |