# CREWS PROJECT PROGRESS REPORT (Jan-Dec 2023)

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| **1. Project title** | Seamless operational forecast systems and technical assistance for capacity building in west Africa (CREWS West Africa) | **2. Project reference**<br>CREWS/RProj/02/West Africa<br>CREWS/RProj/03/AdditionalFinancing/West Africa |
| **3. Implementing Partners involved in the project** | World Meteorological Organization (Lead)<br>World Bank | **4. Regional/National Partners involved in the project**<br>Agrhymet Regional Center (RTC, future RCC, FFGS regional centre, FANFAR regional centre)<br>ANACIM Senegal (RSMC Severe Weather, FFGS regional centre)<br>AEMET and BSC Spain (RC SDS-WAS)<br>IRI (sub-seasonal forecasting)<br>UoR (TAMSAT)<br>KNMI (WA-CA&D)<br>HRC (WA-FFGS)<br>Sierra Leone Meteorological Service<br>Sierra Leone National Water Resources Management Agency |
| **5. Project Duration/Timeframe** **(from year – to year)** | January 2018 – December 2024 | **6. Total Funding Approved by Steering Committee (in US dollars), including fees**<br>5,300,000 USD |
| **7. Reporting focal point(s) from Implementing Partners** | Jean-Baptiste Migraine – jbmigraine@wmo.int<br>Cécile Lorillou - clorillou@worldbank.org | |

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| **8. Project overview** | **Project objective:** to strengthen regional entities to engage with national hydrometeorological agencies in the region to improve risk information and early warning services at national level<br><br>The project develops capacities within existing institutions in line with their mandates : (i) RTC and future RCC Niamey (AGRHYMET) for food security and regional climate services; (ii) RSMC Dakar (ANACIM) for severe weather forecasting and WIGOS coordination; (iii) Casablanca GISC (DGM Morrocco) for information and data exchange; (iv) NMHSs for optimal utilization of new regional capacities including flash flood guidance.<br><br>Beneficiaries are the 19 Members of PRESASS and PRESAGG: Benin, Burkina Faso, Cameroon, Central African Republic, Cap Verde, Chad, Côte d'Ivoire, the Gambia, Ghana, Guinea Bissau, Guinea, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.<br><br>The project complements national CREWS projects in Burkina Faso, Chad, Mali, Niger and Togo, and also contributes to demonstrate the feasibility of developing capacities for urban flood forecasting in Sierra Leone. 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.<br><br>The World Bank is currently supporting the implementation of hydromet and early warning investments in West Africa under the West Africa Food System Resilience Program – FSRP – (P172769 and P178132), through which the project outcomes and impacts will be scaled up in Burkina Faso, Mali, Niger, Togo and with the Agrhymet Regional Center during Phase 1, and Chad, Ghana and Sierra Leone for Phase 2; and under the Resilient Urban Sierra Leone Project (P168608). In addition, the CREWS supported the implementation of hydromet activities under the Freetown Emergency Recovery Project (P166075), which has recently been completed.<br><br>Overall, the project has leveraged 51 million USD (IDA 41 million (Phase 1 of FSRP) / IDA 2 million (SL) / ACP-EU 8 million). |

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| **9. Progress summary** | → **Partnership Agreements**: DWD, IRI, UK Reading University, HRC INRAE, SEPIA, IRD are closed; KNMI, RSMC Dakar, AEMET, BSC, DGM Morrocco are progressing well.<br>→ **Trainings: (i)** SWFP training (including severe weather forecasting, sand and dust storms, common alerting protocol and impact-based forecasting) for West and Central Africa took place on 23-27 May 2022, with 29 forecasters from 16 West and Central African countries; **(ii)** the FFGS training was delivered, in part in Niamey (July 2022) and in San Diego (Nov 2022, Jan 2023), with participation of Burkina Faso, Mali and Niger; **(iii)** the marine services course was delivered (Aug to Nov 2022 and later March to June 2023), with participants from Benin, Cameroon, Cape Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Senegal, Sierra Leone and Togo; **(iv)** trainings on strategic planning, NFCS and quality management systems was organized for French speaking NMHSs (31 May and 1st June 2022) and English speaking NMHS (14-15 June 2023), with presentations from Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Central African Republic, Côte d'Ivoire, Guinea, Mauritania, Niger, Senegal, Togo.<br>→ **Tools: (i)** SEPIA delivered a methodology for urban flood forecasting; **(ii)** INRAE delivered recommendations for scaling-up flash flood forecasting; **(iii)** IRD delivered an analysis of flood forecasting systems; **(iv)** Météo France further updated the MISVA website with a complete set of guidance to assist forecasters with anticipation of extreme weather events based upon sub seasonal forecasting; **(v)** HRC delivered the WA Flash Flood Guidance System; **(v)** FURV proposed a novel method of anticipating cropping seasons (see article); **(vi)** the Barcelona Dust Center has put in place, and evaluated, its sand and dust storm warning advisory system (SDS-WAS) covering 7 countries in West Africa. Since Dec 2023, the tool is connected to the website of ANAM Burkina Faso to ensure semi-automatic conversion to warnings in CAP format; **(vii)** a monitoring tool for the ECOWAS Hydromet Initiative was put in place in Nov 2023, taking stock about country progress on GFCS / NSP implementation. This is currently being followed-upon with a country-by-country analysis of progress; **(viii)** the consultancy team from JBA Associates, working with the WB experts, developed a Flood Risk Guidance Tool for Freetown which provided guidance on the flood risk in the upcoming days. This is a pilot project and the aim is to assess the usefulness of this approach and to attempt to improve on it over the next few years.<br>→ **Investments**: The phase 1 and phase 2 of the regional **Food System Resilience Program** were approved by the WB board in November 2021, and July 2022, respectively, with a substantive hydromet component to support the agriculture and food security sector in West Africa at the regional Level as well as in Burkina Faso, Mali, Niger and Togo for FSRP phase 1 countries, Chad, Sierra Leone, Ghana for phase 2. |

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| | The CREWS project supported the improvement of operational hydromet and multi-hazard forecast systems (severe weather, floods and climate extremes) in the West Africa region through the support provided to the Agrhymet center, ensuring (i) access to and optimal use of global outputs at regional level, (ii) access to and optimal use of regional outputs in participating countries and (iii) through a feedback mechanism, access to better local observation by global models. The activities facilitates support to a cooperation framework to strengthen the capacity of national hydrological and meteorological services and their partnerships with the private sector (ARWE Current Private Sector Landscape_disclosed.pdf / Institutional diagnostics and regional strategies.docx)<br>→ The CREWS project supported technical training for staff of the Sierra Leone Met Service (SLMet) and the National Water Resources Management Agency (NWRMA) to improve their ability in understanding and forecasting heavy rain and flood events. This training drew on expertise from others in the region, specifically Ghana Met. |

## 10. Project Performance

| Interpretation of color coding | | |
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| **High** |  | Good progress; on track in most or all aspects of delivery |
| **Medium** |  | Moderate progress or on track in some aspects of delivery |
| **Low** |  | Less than moderate or poor progress. Not on track in critical areas of its delivery. Requires remedial attention |

| | Rate of expenditure | Rate of delivery | Alignment of Objectives |
|---|---|---|---|
| **Coding** |  |  |  |
| **Narrative** | Use of funds as of 31 Dec 2023:<br>WMO –<br>US$ 2,469,250 disbursed (61%)<br>US$ 459,419 committed (11%)<br>WB –<br>Regional US$ 451,876 disbursed (99,3%)<br>Sierra Leone : US$ 663,773 (91%)<br>Committed US$ 62,988 (9%) | The rate of delivery is satisfactory. | Project remains strongly aligned to the initial objectives |

## 11.Risk Management Status

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| **Risk Status** | Risks remain moderate, as identified at the proposal stage, and have evolved in relation with:<br>- the undergoing enlargement of AGRHYMET mandate to take over the Regional Climate Center function from ACMAD in the near future;<br>- the number of partners involved (HRC, KNMI, AEMET, BSC, DGM Morrocco, ANACIM, IRD, SEPIA, INRAE), thus requiring additional coordination efforts among partners;<br>- Chad and Togo joining as CREWS beneficiary countries since July 2019, resulting in a need to expand the coverage of regional services to additional countries, in a situation of uncertainty related to the access of Chad and Togo to investment financing for early warning; |
| **Measures to address** | The risks are being addressed with :<br>- regular consultations and close communication with stakeholders (see project steering committee meeting 15 June 2022 as an example);<br>- transfer of knowledge to regional centres;<br>- frontloading activities that can be implemented remotely.<br>Due consideration is given not to compromise the quality of outputs in reprioritizing activities. |

## 12. Contributions to CREWS Outputs

**(use number for activities and products and % for project component completion)**

### 11.1 National Output(s)s

| CREWS Output(s) 1: National Meteorological and Hydrological Services service delivery improved, including the development of long-term service delivery strategies and development plans | | | | |
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| **State Project Output(s) in this section** | **Overall Project Target** | **Progress by June 2023** | **Target for reporting period** | **Progress by Dec 2023** |
| New/Enhanced weather and early warning information products | System design of integrated system for Multihazard warning system | First three missions to SL completed with concept note, technical, operational and training plans developed. Training delivered to SLMet in conjunction with colleagues from Ghana Met. | Consultant continues to work on the identified tasks in collaboration with the WB team of specialists. | A mission was held in Dec 2023, combined with training to SLMet forecasters (mixed male and female) by experts from Ghana Met and Leeds University. Workshop was held with representatives of Sierra Leone Media to examine how best to improve dissemination of forecast and warning services.<br><br>Training was delivered to NWRMA on flash flood forecasting. Pilot project to develop an early warning of possible flash floods in Freetown using a small-ensemble WRF suite to drive a rainfall run-off model. This was developed and run by the consultants with the output provided daily to the agencies in Sierra Leone during the rainy season. |
| Enhanced weather and climate information products and services | Customised early warning system product design. | User needs and technical gap analysis conducted to evaluate technical requirements to supplement | Procurement of critical infrastructure in support of early warning systems. | River gauges procured and placed in two locations on “flashy” catchments in Freetown. This allowed the river levels to be compared to the flash flood forecasts provided under the pilot project, allowing an assessment of the value of the modelling approach. |

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| | | customized warning services. | | |

**Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). Please list in bullet points.**

SOLUTION-ORIENTED, UNIQUE - Recognising the key difficulties in developing a locally-based heavy rain / flood forecast and warning service for Freetown (lack of adequate observing network, lack of skilled scientific and technical staff) the WB team and consultants have put in place a pilot project to test whether a small ensemble of WRF local area modelling might be able to provide reliable prediction of flood risk for the Western Peninsula of Sierra Leone and Freetown in particular. The region is very prone to flash flooding and to landslides.

PEOPLE-CENTERED, GENDER-RESPONSIVE: The WB team had identified the low level of scientific and technical expertise apparent in the staff of SLMet; to address this there were two significant training events held in 2023, led by the consultant but also engaging colleagues from Ghana Met and from Leeds University. These resulted in the development and application of Standard Operating Procedures for the daily set of forecasts issued by SLMet, helping to improve their content, reliability and usefulness. The operational forecast team is well-balanced between male and female staff.

## CREWS Output(s) 2: Risk Information to guide early warning systems and climate and weather service developed and accessible

| State Project Output(s) in this section | Overall Project Target | Progress by June 2023 | Target for reporting period | Progress by Dec 2023 |
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| Detailed design and establishment of urban flash flood warning services. | Development of capacity of the NDMA, SLMET and NWRMA to forecast, | Assessment of existing rainfall information completed to evaluate the need for an enhanced hydrological forecasting | Improving the coordination between the three agencies (SLMet, NWRMA and the NDMA) who have | A concept note was developed for a "Flood Risk Task Force" which would be an operational unit that would bring together representatives of the three key agencies on a regular / as |

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| | monitor and manage severe events. | delivery. Flood risk mapping of the different catchments across Freetown completed. | roles to play in providing flood advisories in Sierra Leone. | needed basis to share information and knowledge about upcoming flood risks. The establishment of, and commitment to, this Task Force was formally agreed by the Directors General of the three agencies following a workshop held in December 2023 |

**Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). Please list in bullet points.**

UNIQUE - The CREWS project has provided critical technical advisory services to advance the above mentioned tasks. Both SLMet and NWRMA are still in the early stage of expanding observation network, and making a few stations operational would lay the solid foundation for then for the future expansion of their monitoring capability, which will support the development of warning systems envisioned by the beneficiaries.

SOLUTION_ORIENTED – The Flood Risk Task Force brings together all of the available information and knowledge relating to the flood risk to Freetown on an operational basis and builds on the strengths of the three relevant agencies to help develop a resilient structure for assessing flood risk.

## 11.2 Regional Outputs

| **CREWS Regional Output(s): Institutional and human capacities at Regional WMO and Intergovernmental organizations to provide regional climate and weather services to LDCs and SIDS increased** | | | | |
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| **State Project Output(s) in this section** | **Overall Project Target** | **Progress by June 2023** | **Target for reporting period** | **Progress by Dec 2023** |
| *1. Regional Basic Observing Network (RBON) for data and metadata exchange, including recommendations for incorporating missing or new stations into the WMO WIGOS and WIS systems (OSCAR/Surface, WDQMS, GTS* | 100% | 90% | 95% | 95% |

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| *and WIS/GISCs) and forward looking plan for establishing a regional WIGOS center* – Following the regional workshop on data collection, management, exchange organized in July 2020, an Agreement was signed with DGM Morrocco in March 2021 to provide support to all West African NMHSs. NMHSs are receiving support individually. As of 31 Dec 2023, Several West African countries have selected DGM Morroco as RWC, and others are awaiting new designations. | | | | |
| *2. West Africa Climate Assessment & Dataset (WACA&D) system open to use for NMHSs and regional institutions, with supporting training at regional level and tools materials in French and English* - A local version of the tool is available, hosted in KNMI (see presentation). A cloud-version of the website using DRUPAL was developed in collaboration with the ClimaSA project. The basic system used for WACA&D is now consistent with the implementations in preparation for 6 additional Regional Climate Centres. | 100% | 95% | 95% | 95% |
| *3. West Africa hydro-met and Climate Extreme database (WACE), involving a standard typology of high-impact event types and the assignment of a Universal Unique Identifier (UUID), with supporting training and guidance materials in French and English* - The database was created and transferred to AGRHYMET in May 2021. Single events can be reported with an online interface (see progress report). | 100% | 100% | 100% | 100% |

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| *4. Climate Watch Service (with automatic update)* - Visualized CM products are included in the demonstrator application. Monitoring products are available in the form of climate watch advisory drafts. The user can decide which products to include. Additionally, ERA5T reanalysis data can be included on day 5 for the previous month. TAMSAT and river discharges from GloFAS are also selectable (see progress report). | 100% | 100% | 100% | 100% |
| *5. West Africa Severe Weather Forecasting System online, in line with SWFDP guidebook, with RSMC Dakar Training Desk and supporting training and guidance materials in French and English* – 3 trainings were delivered in 2021, 2022 and 2023. In addition, MISVA website was updated (see report) based on the review of forecasters' use and expectations (2021, 2023). AEMET and BSC have expanded the SDS-WAS system, based on the median value of 12 models, in 7 countries. Since Dec 2023, the tool is connected to the website of ANAM Burkina Faso. | 100% | 95% | 95% | 95% |
| *6. West Africa Flash Flood Guidance System* - The FFGS tool was delivered in June 2023. Training was delivered, in part in Niamey (July 2022) and in San Diego (Nov 2022, Jan 2023), with participation of Burkina Faso, Mali and Niger. | 100% | 90% | 100% | 100% |
| *8. Flood forecasting feasibility studies in West Africa.* **(i)** SEPIA delivered a methodology for urban flood forecasting; **(ii)** INRAE delivered recommendations for scaling-up flash flood forecasting; **(iii)** IRD delivered an analysis of flood forecasting systems. INRAE and IRD | 100 % | 60% | 100% | 100% |

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| analyzed surveys and interviews and explored use of EFAS -GlofaS and CHMI - FFG to deepen knowledge about the operational use of their systems. | | | | |
| *9. Development of the Community of Practice.* The matrix on synergies between CREWS and related projects was further updated. The WMO Strategic Planning Community of Practice was put in place in Jan 2022, and held 2 meetings (May 2022, June 2023). A a monitoring tool for the ECOWAS Hydromet Initiative was put in place in Nov 2023, taking stock about country progress on GFCS / NSP implementation. | 100% | 30% | 50% | 50% |
| *10. Pilot services on early warnings for agricultural severe drought in West Africa*. Following the training workshop on "Satellite rainfall estimation and validation for Africa" organized with 5 countries in Nov 2021 (see report), UoR finalized the implementation of the system (see report), with trainings provided in 2020 and 2021. With funds from 5 country projects, WeatherForce developed an open-source tool to make indicators available in real-time (see report), and under the Chad WB agriculture project, FURV developed an updated version of its crop calendar, for which a training will be funded by CREWS in Jan 2024. | 100% | 95% | 98% | 98% |
| *11. Recommendations related to dissemination of seasonal and monthly prediction products and services in West Africa*. Python tools for subseasonal forecasting have been developed by IRI and tested for West Africa, based on the S2S and SubX model forecast databases and IRI tools. Guidance has been provided by IRI for the April-May RCOFs (PRESASS and PRESAGG). See report. | 100% | 100% | 100% | 100% |

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| *13. Service delivery strategy, the concept of operations and business model for AGRHYMET.* A Final report is available and supports Aghrymet's Public Private Parterships strategy, as well as an Impact Assessment Manual and toolkit to assess the current 'success' of AGHRYMET's courses defined here by participant feedback but also longer term impact at the organisational and country level needs. | 100% | 80% | 100% | 100% |

**Additional information: briefly indicate, with concrete examples, the contributions to CREWS value propositions (gender-responsive, multiplier, people-centered, promote coherence, solution-oriented, unique), as relevant (150 – 200 words). Please list in bullet points.**

**Gender Responsive -** The project considers gender equality in itself a key development objective, with direct demonstrated impacts in terms of increasing productivity, improving the impact of development for future generations, and making institutions more representative. To this end, the project promotes approaches aimed at eliminating the differences between men and women in accessing economic opportunities and in productivity, as well as to help give women a stronger voice within society. In Sierra Leone, the user needs assessment will fully take into account the gender aspect. In addition, the WB investment projects informed by CREWS West Africa are developing a gender action plan to consider the gender aspects in all relevant activities.

**Multiplier -** The project mobilizes specific expertise to guide investments such as AfDB SAWIDRA, EU Climate Services (8 million EUR) and WB Food System Resilience Program (P172769 and P178132), which covers Burkina Faso, Mali, Niger and Togo in addition to the Agrhymet Regional Center in its first phase, and Chad, Ghana and Sierra Leone in its second phase[Overall program budget for phase 1 and 2: 645 million USD, budget for hydromet activities TBD]. It also supports a component to strengthen emergency management including early warning systems under the Resilient Urban Sierra Leone Project (P168608).

**People-centered -** The project mobilizes expertise to support AGRHYMET, working directly with countries' multidisciplinary working groups to track food security and nutrition from the community to the regional levels. User engagement is an important aspect of the design of the CREWS West Africa project. While the current global pandemic has made it challenging to conduct on-the-ground consultation, the project incorporates users' perspective through, for example, the development of service delivery strategy.

**Promote Coherence -** The project integrates expertise from regional and global centers such as Dakar RSMC, Niamey RTCs, Niamey RCCs, Météo-France, DWD, KNMI, ECMWF, UK Reading, HRC, and coordinates frequently with multilateral and bilateral development partners in the

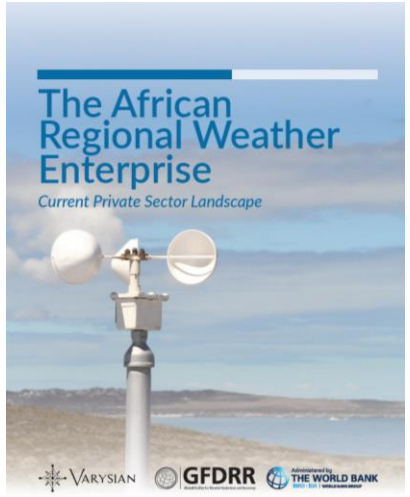
sub-region. The major ones are participating in the Steering Committee meetings. Coordination with international partners active in the hydromet domain in West Africa is key to ensuring effective use of funds and sustainability. WMO and WB are actively coordinating with those partners through bi-lateral meetings and workshops to understand their on-going and planned activities and inform them about our plan to seek complementarity and avoid duplication.

**Solution-oriented -** The project makes available information from global and regional centers to national meteorological and hydrological services. Cascading forecasting is substantially improving the lead time and accuracy of forecasts and warnings. Public private engagement is an integral part of strategic dialogue with governments in the region to ensure innovative business models and solutions are duly considered in considering different options.

**Unique -** The seamless approach to early warning supported by the project is unique, possible in relation with the multiplier effect and coherence. The project leverages the economies of scale by promoting regional collaboration, and contributes to the development of cost-effective hydromet system regionally. Such an approach will also provide cross-learning opportunities for countries in the region and facilitate a peer-to-peer support system. On-going work with Agrhymet Regional Center on the development of a business model complemented with Public-Private partnerships, will directly inform more sustainable operations.

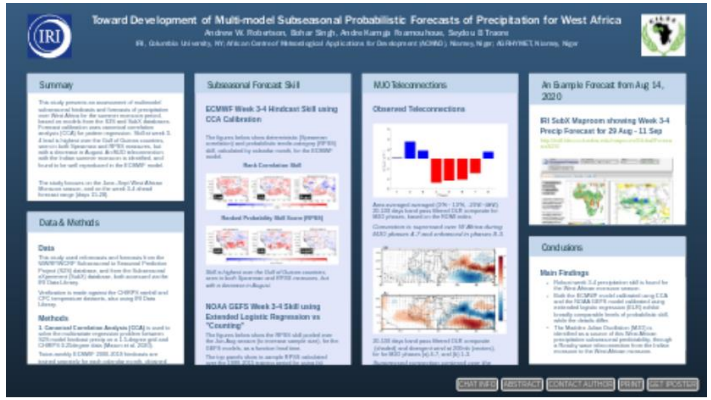
## 13.Visibility products


Project presentation

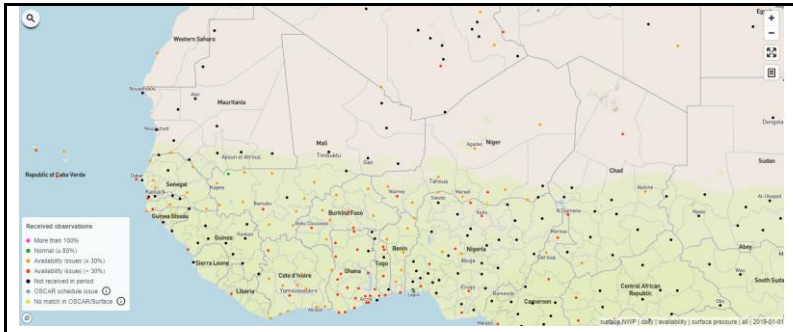


ARWE Current Private Sector Landscape_disclosed.pdf

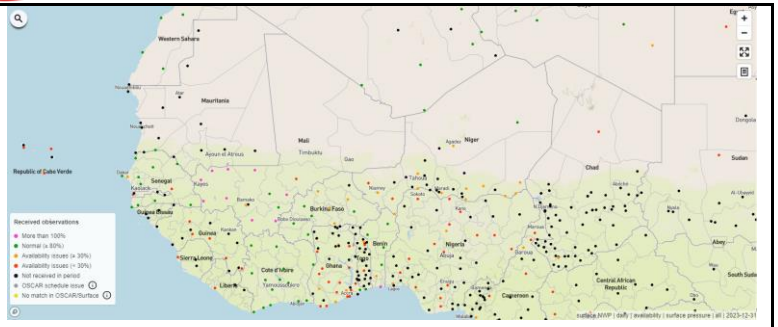

Video message from RSMC Dakar




Poster prepared by IRI, ACMAD and AGRHYMET

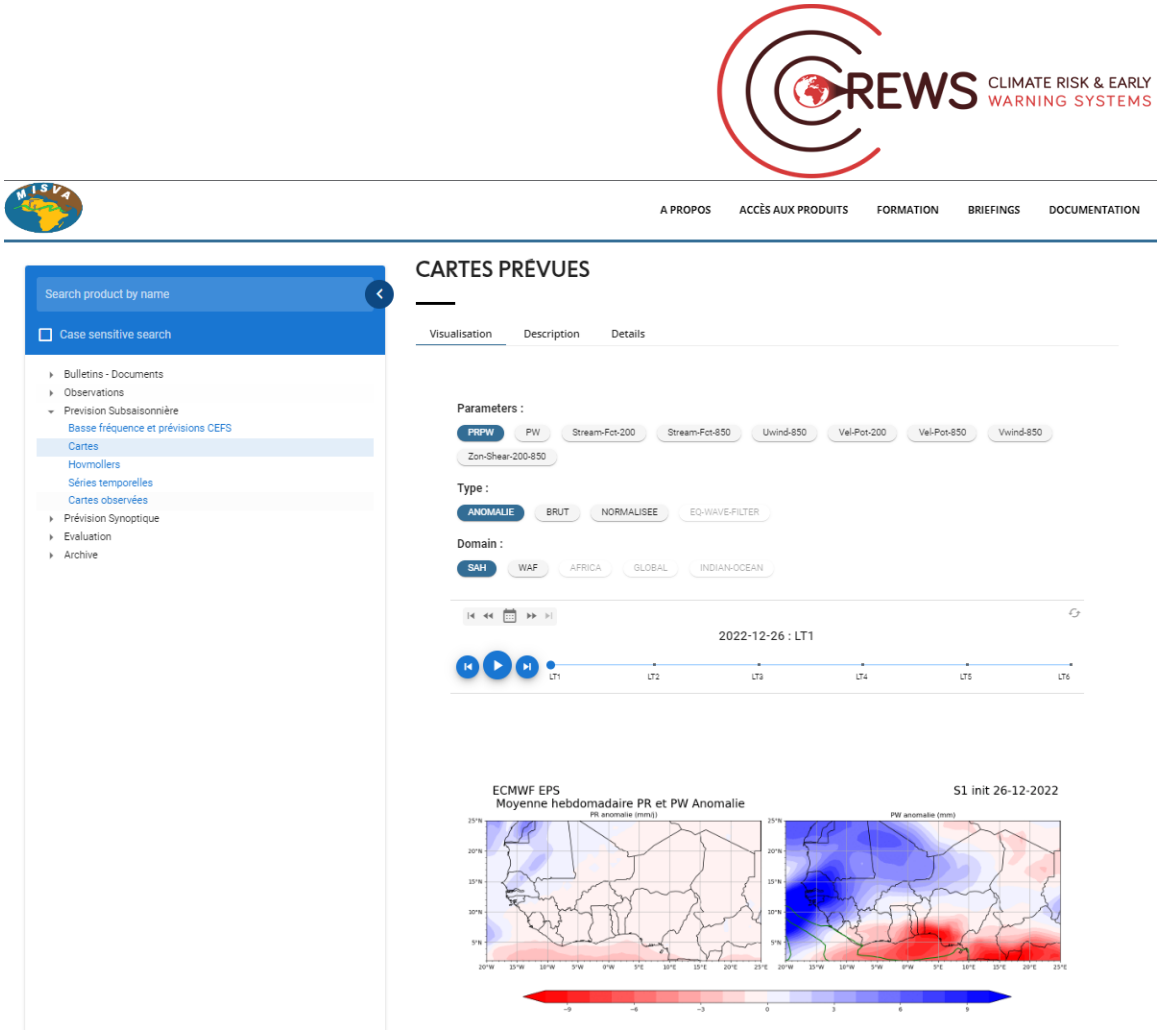



1 Jan 2019

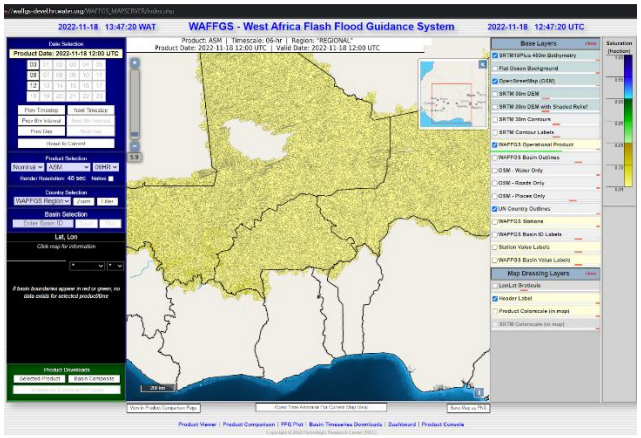


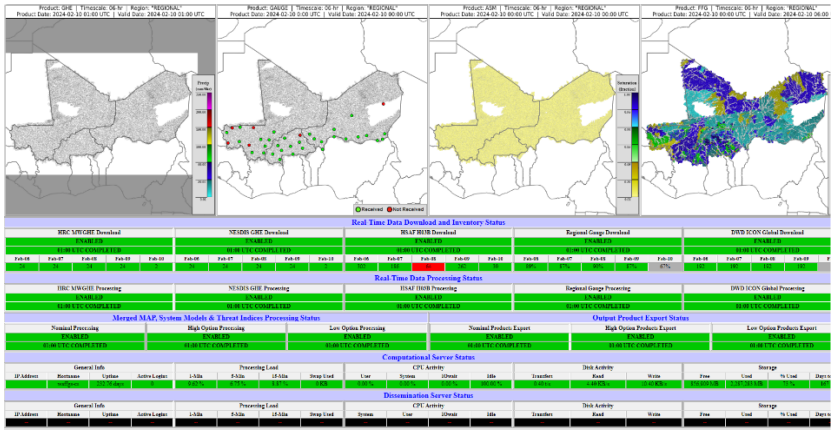

31 Dec 2023

WIGOS Data Quality Monitoring System (WDQMS) webtool, illustrating improvements in observations and data sharing in relation with GISC/RWC Casablanca (see Implementation Arrangement)

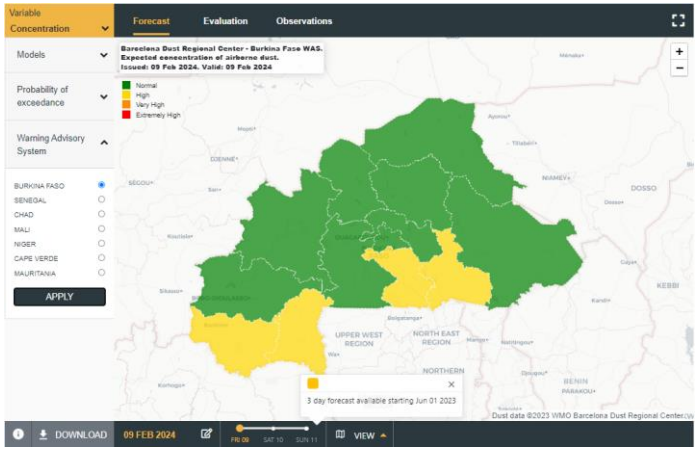


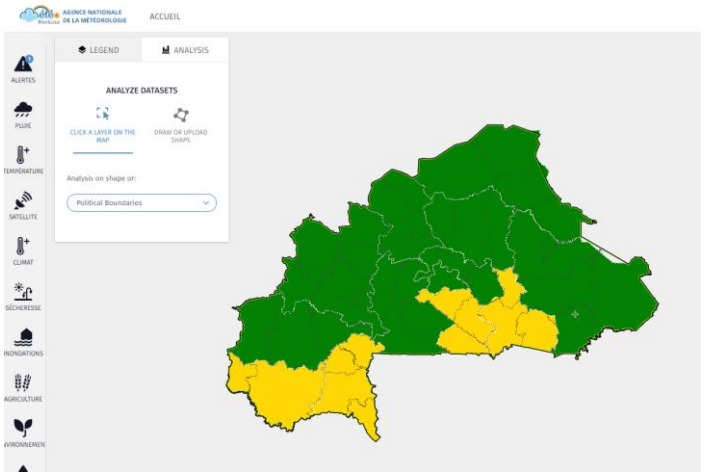

[MISVA website](#) providing 6-week advanced sub-seasonal forecasts. Weekly briefings are organized to guide warning issuance by NMHSs.



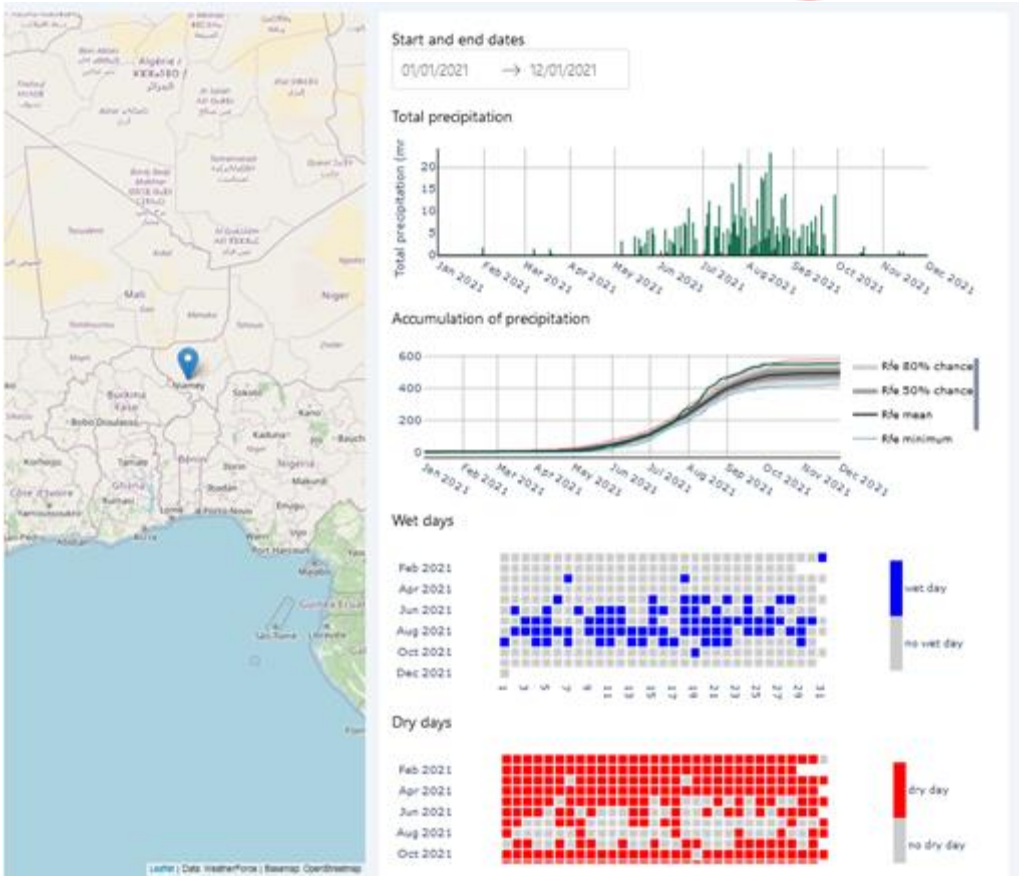




Flash Flood Guidance System (see [article])




Sand and Dust Warning Advisory System (https://dust.aemet.es/products/daily-dust-products) with automatic integration in NMHS websites (Burkina)




Indicators for production of agrometeorological bulletins and warnings in all West Africa (hub.weatherforce.net/service/crews)

## 14.Supporting documents

- Project proposal approved by CREWS Steering Committee (Aug 2018)

- Additional financing approved by CREWS Steering Committee (Feb 2020)
- 1st Steering Committee Meeting Report (Dec 2018)
- 2nd Steering Committee Meeting Report (Nov 2019)
- 3rd Steering Committee Meeting Report (June 2022)
- Mapping of initiatives relevant for Hydromet, urban development and coastal risk management in Sierra Leone
- Mapping of initiatives relevant for Hydromet and early warning in West Africa
- Report of the consultation on the 9 elements of the CREWS West Africa project (Sep 2018)
- Setup of a CREWS West Africa Community of Practice (Sep 2018)
- Training on interpretation of numerical weather prediction products (Lomé Oct 2018, Ouagadougou May 2019)
- Training on crop modelling with SARRA model (Ouagadougou, Nov 2018)
- Training on agricultural land data assimilation (LDAS, Niamey, May 2020)
- Training on agricultural statistical risk assessment with crop calendars (Ouagadougou, Feb 2020)
- Regional workshop on data collection, management, exchange (July 2020)
- TAMSAT Training Workshop (July 2020)
- SWFDP WA Implementation Plan (Sept 2017)
- FFGS WA - Report of the Technical Planning Meeting (June 2019)
- CIFI WA - Proposed workplan
- MISVA - Terms of reference
- Terms of reference of the CREWS West Africa Steering Committee
- Report of the first session of the CREWS West Africa Steering Committee (19 Dec 2018)
- Draft report of the second session of the CREWS West Africa Steering Committee (12 Nov 2019)
- Report of the joint KNMI-DWD-WMO mission to AGRHYMET (Nov 2019)
- Partnership agreement with KNMI - sub-regional climate dataset WACA&D (report
- Partnership agreement with DWD - cataloguing of extreme events and climate watch service (report Oct 2020)
- Partnership agreement with Météo France - MISVA (report Dec 2020)
- Partnership agreement with UoR - improving use of TAMSAT (report Oct 2020)
- Partnership agreement with IRI - forecasting subseasonal timescales in PRESASS and PRESAGG (report Oct 2020)
- Partnership agreement with HRC - flash flood guidance system in Burkina Faso, Mali, Niger (report Dec 2020)
- Partnership agreement with ANACIM (RSMC Dakar) - strengthening SWFP
- Report on Institutional diagnostics and regional strategies for delivering Hydromet services in WA Region (Institutional diagnostics and regional strategies.docx)
- Impact assessment Manual for the strengthening of Agrhymet's training program (CREWS - Impact Assessment Manual - Walker - Final - Eng.pdf)

## *15.* Project History

*Highlight key achievements since project started in bullet points, include all visibility and supporting documents other than those from the last 12 months*

See full project history on the project management spreadsheet