



**ACMAD'S QUADRIENNAL ACHIRVEMENTS  
2019-2022**

**December 2022**



## ACMAD VISION 2030

An African continent where all nations are benefiting from a **world class operational continental meteorological centre** to become ***resilient to extremes events*** and ***empowered to support their sustainable development*** with better meteorological services

Impact Based forecast example with co-design and co-production between **ACMAD and WHO Regional Office for Africa** as part of the activities of the UIP on Climate and Health during the meningitis season in Africa.

Source: <https://www.sciencedirect.com/science/article/pii/S2405880722000449>



## 1. Context

As a continental international centre for meteorological applications, ACMAD is dedicated to continental weather and climate watch as well as applications of meteorology for sustainable development of Africa. ACMAD has operated during the past four years delivering on the following four long term goals:

- Strengthening capacity of National Meteorological and Hydrological Services and related stakeholders;
- Improving quality of services;
- Enhancing access to data and supporting research and innovations;
- Modernizing governance and management of the centre.

The 2030 global agenda for sustainable development, the Sendai framework for disaster risk reduction and the Paris Agreement to accelerate implementation of the UN Framework Convention on Climate Change were global drivers of actions during the period. In Africa, Agenda 2063 of the Africa Union, related climate change and resilient development strategy, the Africa programme of action for implementation of the Sendai framework for disaster risk reduction and the African strategy on meteorology (weather and climate services) were regional frameworks guiding implementation of activities to realize the goals mention above.

The purpose of this report is to present the past four years progress supporting the goals and mission described above and responding to the global drivers and related continental frameworks. It will describe objectives and results using indicators of the strategic plan. Concluding remarks and perspectives will highlights key areas of future development capitalizing on opportunities available.

## 2. Highlights of activities and achievements

**Standard operating procedures** for forecasting developed with the SWIFT project test beds are available for optimal operations. The African **Continental MultiHazards Advisory Centre is established and was inaugurated on October 31,2022**. Its product is available at:

<http://sqbd.acmad.org:8080/thredds/fileServer/FIT/BRIEFING/briefing.pdf>

Four Regional Advanced Retransmission Systems (RARS) for Low earth orbiting satellite data, a High-Performance Computing system, a data server and a power generator to stabilize energy supply were procured and installed. ACMAD has organized on the job training, secondments, internships and fellowships for a minimum of **twenty-two countries with up to forty-five experts attending**.

A new mechanism (ACCOF) to coordinate and harmonize methods, tools and climate outlooks products at continental level in collaboration with RCCs and NMHSs is operational since January 2022. **Twelve ACCOFs** have so far been organized.

Based on WMO competency framework for climate services and survey questionnaire responses, ACMAD undertook **gap analysis on capacity for delivering climate information in southern Africa** including an action plan to address the gaps. This plan is being implemented with development of training materials filling these gaps.

During the 2021/22 cyclone season **twinning exercises with NMHS, RSMC la Reunion, ACMAD and World Meteorological Centres** demonstrated the operational cascading process delivering better advisories and warnings at national level.

To support quality services, two synoptic/mesoscale forecast briefings per week, three sub seasonal forecast and one seasonal forecast discussions per month are organized with RCCs, RSMCs and NMHSs to provide inputs to the continental advisory centre. **Two annual state of climate reports for Africa** were prepared and published with WMO. **Twelve ACCOFs statements were published. Seven RCOFs statements were published each year with ACMAD contribution on the continental perspectives and/or regional climate forecasts** in regions with RCCs in development stage. The 4 mandatory functions of the **continental RCC have been operational. Briefings/Debriefings** for high impact weather and climate events opened to all NMHSs online have been opportunities for wider exchanges on new products. Case studies and debriefings post high impact events are included in preparatory activities leading to hazards situation reports generated by the continental advisory centre.

The PUMA **station** is operational and support to NMHSs for maintenance have been provided upon request. The **climate station** continued to be tested in collaboration with EU JRC under ClimSA project.

**More than ten trainings including sessions for research on predictability** are organized each year as part of ACCOFs, RCOFs, on the job training, secondments and workshops covering African NMHSs and RCCs.

**More than ten countries** were exposed to training and forecast verification research each year. New products, methods and tools updates, training materials, procedures and instruction manuals are deliverables of research projects.

New products for meningitis surveillance and control is available <https://www.sciencedirect.com/science/article/pii/S2405880722000449> .

The 4<sup>th</sup> session of AMCOMET declaration in Cairo called for ACMAD to become the technical arm of AUC on climate matters. A briefing was organized for the AU Permanent Representative Committee of Ambassadors' Sub-Committee on environment to raise awareness on ACMAD mission, vision and main achievements supporting understanding of the centre's role as technical arm of AUC on climate matters. Contacts maintained with UNECA with a draft relationship agreement between ACMAD and AUC implementing the AMCOMET Cairo Declaration submitted to UNECA legal office.

**Seven financial reports and external audits** were carried out covering years from 2015 to 2021. The last 3 three years of audited accounting and financial reports are available in IFRS standard format. Future effort would be to consider EU pillar

assessment to progressively become a partner of the EU and other donors for implementing actions. As an EU partner for implementation, the centre is expected to mobilize the substantial investments required for NMHSs modernization programmes. Regular progress or annual reports have been provided to relevant bodies and donors. Staffs (197) were mobilized with support of partners to implement activities and projects.

Future efforts to raise the countries contributions reducing heavy reliance on project staff is expected with the formulation of the 2024-27 strategy and related four years' operating plan. These documents would support resource mobilization with presentations at high level events.

### **3. Strengthening National Meteorological and Hydrological services and stakeholders**

Infrastructure, partnerships, capacity, advanced methods, tools and products were focus areas of work under this goal.

**Indicators** on frameworks for optimal operations of RCCs and NMHSs available, NMHSs supported towards higher category and their capacity assessed:

*Capacity assessment and frameworks for optimal operation*

**Gaps and recommended actions** to prepare **RCC demonstration implementation plans** are available for ECOWAS and ECCAS developing RCCs. Guide with instruction manual for production of seasonal forecasts for ECCAS RCC and NMHSs is available. Capacity gaps analysis and recommended actions to improve the use of continental and regional climate products by ECCAS NMHSs are available. The NMHSs assessments for other RECs are considered for the future.

**Standard operating procedures** for forecasting developed with the SWIFT project test beds are available for optimal operations. One example was published at: [https://eprints.whiterose.ac.uk/185379/1/SWIFT\\_nowcasting\\_operating\\_procedure.pdf](https://eprints.whiterose.ac.uk/185379/1/SWIFT_nowcasting_operating_procedure.pdf) ).

The African **Continental MultiHazards Advisory Centre is established** ( <http://sgbd.acmad.org:8080/thredds/fileServer/FIT/BRIEFING/briefing.pdf> ) and was inaugurated at ACMAD on October 31, 2022. It delivers hazards situation reports and hazards watches to the AUC situation room based in Addis ABABA. It provides continental coordination and harmonization of methods, tools and products with RSMCs, RCCs and NMHSs. The optimal institutional framework on the monitoring and forecasting element of the early warning system is available to support the early warning for all initiative.

### **Infrastructure**

Four Regional Advanced Retransmission Systems (RARS) for Low earth orbiting satellite data, a High-Performance Computing system, a data server and a power generator to stabilize energy supply were procured and installed. The RARS stations are contributions to the WMO space programme and WIS through the Digital Direct Broadcast Network.

### **Partnerships**

Given the limited human resources, partnerships have contributed to manpower with the Norwegian Refugee Council (currently one deployee and up to 3 deployees expected in 2023). The UN Disaster Risk Reduction Regional office for Africa contributed 2 consultants to support the MultiHazard Advisory Centre. Consortia of institutions have implemented major projects including SWIFT, FOCUS-AFRICA, U-CLIP, KIMPALA, GSTIC. Partnerships with EUMETSAT, the African institute for Mathematical Studies (AIMS) and Pennsylvania State University have been established to support research and related training as well as access to data.

### **Capacity**

**Indicators** on curricula training materials, staff trained and twinning exercises:

ACMAD has organized on the job training, secondments, internships and fellowships for **twenty two countries with up to forty five experts benefiting**. Trainings curricula development focused on climate data management, climate monitoring, Weather nowcasting and synoptic/mesoscale forecasting, sub seasonal and seasonal forecasting as well as analysis of climate change projections for climate scenario generation. Trainings with **four Regional Climate Outlooks** (RCOFs) in the RECs (ECOWAS, ECCAS, SADC, IOC) **were organised each year**. With IGAD and UMA participation to RCOFs have facilitated exchanges on methods, tools and products. A new mechanism (ACCOF) to coordinate and harmonize methods, tools and products at continental level in collaboration with RCCs and NMHSs is operational since January 2022. **Twelve ACCOFs** have so far been organized.

Based on WMO competency framework for climate services and survey questionnaire responses, ACMAD undertook **gap analysis on capacity for delivering climate information in southern Africa** including an action plan to address the gaps. This plan is being implemented with development of training materials filling these gaps.

**Training materials** used include methodologies, tools ( PyCPT, CFT, CLIMTAG, U-CLIP, Climate station, Climsoft, INSTAT) lectures and practical materials, products prototypes, validation study reports, technical notes, bulletins, reports, advisories, outlooks, briefs, and statements. **Standard operating procedures and instructions manuals** for forecasting developed with SWIFT are included in training activities of the Centre. Seasonal, decadal, climate scenarios, impact and risk assessment training materials were developed under FOCUS-Africa and ClimSA.



During the 2021/22 cyclone season **twinning exercises with NMHS, RSMC la Reunion, ACMAD and World Meteorological Centres** demonstrated the operational cascading process delivering better advisories and warnings at national level. Future effort to expand such twinning exercises to other RSMCs, RCCs and NMHSs in Africa is proposed under the African MultiHazards Advisory Centre.

**Indicators** on policy and other user organizations trained:

**More than ten side events** organized and high-level statements delivered at UNFCCC COPs exchanging information on the state of climate of Africa with climate policy community. Platforms for DRR in Africa and at global level attended sharing **hazards situation reports and continental hazards watches** generated by the African Continental Multi hazard Advisory Centre at ACMAD.

#### 4. Improving quality of services

**Indicators** on disaster strategies, contingency plans, published advisories, NMHSs supported, impact-based information available to humanitarian community

With the establishment of the continental advisory centre, prototype hazards watch, potential impacts and preparation/response measures are generated. Under the continental user interface platform established for climate and DRR, ACMAD through the advisory centre in collaboration with UNOCHA improve impact information with the percentage of population to be affected by floods across the continent as actionable indicator. **Future efforts will be devoted to accelerating transfer and downscaling of this product at country level in the framework of NMHSs and country OCHA offices. Updates of contingency and emergency plans with the proposed measures are expected using the national and regional platforms for disaster risk reduction.** A partnership between ACMAD and UNDRR is established to **prepare and test standard operating procedures** leading to the updates and implementation of these contingency/emergency plans.

Two synoptic/mesoscale forecast briefings per week, three sub seasonal forecast and one seasonal forecast discussions per month are organized with RCCs, RSMCs and NMHSs to provide inputs to the continental advisory centre.

**Indicators** on the state of climate report for Africa published, RCCs/NMHSs sustained and active in UNFCCC processes, ACCOFs and RCOFs statements published, adaptation and resilience building projects identified, COPs and other global events attended

**4 technical notes** on annual the state of climate of Africa were prepared to support discussions and technical briefings. **2 annual state of climate reports for Africa** were prepared and published with WMO. Technical assistance was provided to some countries upon request to generate national state of climate reports. **12 ACCOFs statements were published. 7 RCOFs statements were published each year with ACMAD contribution on the continental perspectives and/or regional climate forecasts** in regions with RCCs in development stage. The 4 mandatory functions of the **continental RCC have been operational.**

Impact based forecasts and outlooks with UNOCHA and WHO regional office for Africa for humanitarian and health applications have been experimented and steps forward towards pilot demonstration is been proposed.

Future efforts will improve the impacts, risk analysis and adaptation/resilience section of the state of climate report and strengthen engagement of the hydrological community in the production of the report in Africa through the climate-water user interface platform. New actionable products under development are expected to further improve and increase the value of future state of climate report in the UNFCCC and sustainable development processes.

**Indicators** on emerging services, activity on social media NMHS and RCCs supported to deliver new services

New products developed to support monitoring of the **start of the agriculture season**, extremely hot days, surface of land hit by heavy precipitation potentially leading to flood, Impact based climate outlooks, impact-based vigilance, hazard situation report and continental watch are provided. **Twenty two countries mentioned above** for on-the-Job training, secondments and internships were exposed to ACMAD's Facebook and tweeter exchanges to demonstrate visibility through social media. The new actionable climate information presented to the countries are expected to be generated at national level with technical assistance of ACMAD. **ACCOFs and RCOFs networks involving NMHSs and RCCs** are increasingly made visible through Facebook and tweeter. **Briefings/Debriefings** for high impact weather and climate events opened to all NMHSs online have been opportunities for wider exchanges on new products. Case studies and debriefings post high impact events are included in preparatory activities leading to hazards situation reports generated by the Advisory centre.

**Climate trends and impacts assessment report was prepared by ACMAD** at the request of the UNECA Subregional Office for Africa as a contribution to the mainstreaming of climate information in the formulation the 2050 vision commissioned by ECOWAS. Such services for policy and planning are expected to be extended to other Regional Economic Communities supporting climate resilient and sustainable development planning.



**ACMAD collaborated with the African climate policy centre for the review of the report on the impacts of climate change on Agriculture** in pilot countries in Eastern, Southern and Western Africa. Strengthening of meteorological services for agriculture and extensions services was highlighted as a concluding priority policy in addition to investments in fertilisers and new crop varieties to address climate change adaptation and support mitigation efforts. The two initiatives with UNECA demonstrated operational collaborations to be strengthened for sustainable development planning well informed by climate knowledge in Africa.

## 5. Access to data infrastructure

**Indicators** on support with station, observing and data collection and management systems

The Centre's **vision on Data** is to become an **operational Data Collection and Production Centre** of the WMO Information System by 2030 disseminating continental data and products including from the four RARS stations under the Direct Broadcast Network for near real time Relay of Low earth orbit satellite data.

Following installation of RARS stations, connection to the broadcast network is planned for 2023. The web portal including the RCC site, the data centre page and geoportal are available. The **web portal and RCC site are operational** while the data centre and the geoportal are under development. Applications tools are available including CLIMTAG for generation of climate indicators for agriculture calendar updates, MyDEWETRA for forecasting for DRR, risk analysis, and warning, CLIMSOFT for climate data management, PyCPT and CFT for climate prediction including downscaling, SAF nowcasting.

The PUMA **station** is operational and support to NMHSs for maintenance have been provided upon request. The **climate station** continued to be tested in collaboration with EU JRC under ClimSA project.

ACMAD continued to contribute to discussions and presentation of the concept note for the Meteosat Third Generation (MTG) transition and development of African Meteorological Satellite Applications Facilities (AMSAF) programmes which are parts of implementation of the Abidjan declaration. Future efforts are expected to support formulation and implementation of these programmes.

The continental synoptic stations database on **climsoft has been regularly updated**, PUMA reception station for data disseminated via EUMETCAST is operational, international archives have been usually accessible (Copernicus Climate Data Store, ECMWF data archive, NOAA/NOMAD data Server, IRI data Library ....).

With the challenge of energy instability, collaborations are developed to test cloud computing solutions. This option is also being discussed in the framework of the ClimSA and WMO guidelines on NWP proposed the cloud option to run limited area models in the near future.

Satellite Applications Facility (SAF) will benefit from opportunities provided by the upcoming MTG sounder 1 in 2024 together with Low Earth orbiting Satellite data relayed

through the four RARS stations. AMSAF nowcasting application has been proposed to be extended adding NWP SAF needed to support the early warning for all initiative in Africa.

Data on microfiches at ACMAD have been converted into images with the support of Copernicus programme. The support is continuing with the digitization process expected to be long given the difficulties on the automatic digitization approach.

**Indicators** on research and innovation projects and consortia available, NMHSs and RCCs verifying and assessing performance of products, socio-economic impact research:

**More than 10 trainings including sessions for research on predictability** are organized each year as part of ACCOFs, RCOFs, on the job training, secondments and workshops covering African NMHSs and RCCs.

**More than 10 countries** were exposed to training and forecast verification research each year.

Support from scientists of **MEDCOF, SWIFT, AMHEWAS, FOCUS, U-CLIP, CLIMSA Climate station development and KIMPALA** initiatives was usually available.

**7 consortia of institutions implementing the initiatives** provide training material and contribute with lectures. Advanced methods and tools (**CLIMTAG, U-Clip, MUKAU and MYDEWETRA platforms, PyCPT, Climate Station**) for research and innovation are therefore transferred. New products, methods and tools updates, training materials, procedures and instruction manuals are deliverables of research projects.

New products for meningitis surveillance and control is available <https://www.sciencedirect.com/science/article/pii/S2405880722000449>.

ACMAD organized a User interface Platform workshop in July 2022 with a session **on methodology for socio-economic impact and risk assessment**. Hand-on exercises were organized to demonstrate practical use of the tool.

During RCOFs, more than half of countries experts in ECCAS and ECOWAS undertake forecast verification. As part of ACCOFs, all RCCs provide verification products. ACMAD in the future is expected to expand the portfolio of verification methods and tools to be used for assessment of different attributes of forecast quality.

## 6. Strengthening Governance and management modernization

**Indicators** on compliance with regulatory requirements, collaboration frameworks established, projects with partners available

The 4<sup>th</sup> session of AMCOMET declaration in Cairo called for ACMAD to become the technical arm of AUC on climate matters. A briefing was organized for the AU Permanent Representative Committee of Ambassadors' Sub-Committee on environment to raise



awareness on ACMAD mission, vision and main achievements supporting understanding of the centre's role as technical arm of AUC on climate matters. Contacts maintained with UNECA with a draft relationship agreement between ACMAD and AUC implementing the AMCOMET Cairo Declaration submitted to UNECA legal office. ACMAD and UNECA teamed up to organize climate talks and the Africa forum for sustainable development during the first quarter of 2023. A letter from the ACMAD Board Chairperson was sent to UNECA executive Secretary to request for a meeting on the improvements needed on the governance of ACMAD and the implementation of the relevant provisions in the Cairo declaration.

The formulation of the ACMAD 2020-2023 strategic plan and related operating plan was completed after review by the Scientific Advisory Committee and approval by the board.

More than Four (4) board sessions were organized during the period with related recommendations and resolutions implementation status regularly presented.

In addition to side events, high level events at COPs were organized with participation of ACMAD. The latest high level ACMAD statement is available at <https://unfccc.int/documents/624061>. It highlights ACMAD achievements and future initiatives on early warning for all and adaptation to climate change in Africa in support of AU agenda 2063 and relevant action plans and strategies including the African strategy on meteorology (Weather and Climate Services).

Resources mobilization meetings at COPs facilitated agreements with NRC for more staff, US delegation on the formulation and implementation of projects in the framework of President Biden's Emergency plan for resilience and adaptation to climate change. The Belgium development cooperation, the EU green deal and Horizon Europe have indicated interest for development and implementation of joint climate action.

**Eight Memoranda and agreements** were prepared, signed and/or implemented for **projects** (IMPALA, U-CLIP, KIMPALA, SAWIDRA, CLIMSA, GSTIC, FOCUS-Africa, SWIFT, WISER ).

ACMAD strengthened the collaboration with organizations. In particular agreements or arrangements were negotiated with:

- the International Federation of Red Cross and Red Crescent Societies to facilitate the use of vigilance services for humanitarian interventions;
- the Norwegian Refugee Council/Norwegian Capacity to deploy experts to support ACMAD;
- the Africa Risk Capacity Agency of the African Union to facilitate integration of advisories and outlooks in drought insurance premiums and pay out structure and timing;

- the Agence Gabonaise d'Etudes et d'Observations Spatiales (AGEOS), the South African Space Agency (SANSa), ICPAC and CILSS/AGRHYMET to support the installation, operation and maintenance of RARS stations;
- the University of Leeds for specific events organized by the SWIFT project;
- WMO for implementation of projects (FOCUS-Africa, CLIMSA);
- VITO for implementation of projects (U-CLIP, GSTIC, KIMPALA, COPERNICUS);
- UNDRR for consultants supporting development of early warnings;
- AUC for implementation of CLIMSA;
- EUMETSAT on access to global data and exchange ACMAD products;
- Pennsylvania State University for training and research on meteorology;
- African Institute for Mathematical Studies (AIMS) for capacity building through internships on climate resilience

**Indicators** on policy, procedures, projects, reports and annual plan/budget available

The formulation of the ACMAD 2020-2023 strategic plan and related operating plan was completed after review by the Scientific Advisory Committee and approval by the board. Seven financial reports and external audits were carried out covering years from 2015 to 2021.

[http://154.66.220.45:8080/thredds/catalog/ACMAD/AUDIT/rappport\\_audit\\_2015\\_2021/catalog.html](http://154.66.220.45:8080/thredds/catalog/ACMAD/AUDIT/rappport_audit_2015_2021/catalog.html) . Most projects external audits were regularly carried out on time.

Following mobilized of resources, the ISACIP project which ended since 2015 is being audited by the bank in 2022. The draft audit report was submitted to the bank and is under review. Updates were made on the staff and financial regulations aligning ACMAD's financial reporting with International Financial Reporting Standards (IFRS). The past three years of audited accounting and financial reports are available in IFRS format. Future effort would be to consider EU pillar assessment to progressively become a partner of the EU for implementing its external actions. Regular progress or annual reports have been provided to relevant bodies and donors. Staffs were mobilized with support of partners to implement activities and projects including ClimSA, UCLIP, KIMPALA, MHEWS, SWIFT, FOCUS-Africa, GSTIC, CVF, AMHEWAS/UNDRR, NORCAP/NRC.

Future efforts to raise the countries contributions reducing heavy reliance on project staff is expected with the formulation of the 2024-27 strategy and related four years' operating plan. These documents would support resources mobilization with presentation at high level events.



Communication, visibility and outreach efforts featured ACMAD organizing or attending events at COP, high level ministerial sessions, WMO Technical Commissions and Regional Association I, WMO Standing Committee on Earth System Modeling and prediction meetings, WWRP Working Group on Tropical Meteorology research, steering/advisory/technical meetings of projects.

During the year and following internal review of the management, areas of improvements were identified and the following documents are being prepared or updated to further modernize the centre's management:

- Risk register and assessment templates
- Risk management policy
- Code of conduct for staff
- Safeguarding policy
- Quality policy
- Ethics policy/code

The annual work plans and budgets for 2019 up to 2022 was regularly presented and approved by the board.

Projects formulated or implemented during the period included:

- The next phase of WISER on impact-based forecasting from sub seasonal to seasonal timescales for anticipatory action;
- GSTIC local climate modeling supporting tree planting and capacity building for Niamey city resilience to heat stresses;
- Gap Analysis and action planning to support RCC demonstration in ECCAS and ECOWAS regions;
- Climate services and applications in the agriculture, health, water and Disaster sectors;
- Local Climate change information for adaptation planning in cities;
- Development of climate services across the value chain;
- Development climate indicators for resilience in the agriculture sector and training;



- Preparation of standard operating procedures facilitating early warning system implementation at continental, regional and national level in Africa;
- Coordination of state of Africa climate report preparation, development of drought watches products and platform for hydrological status and outlook;
- The preparation of transition to Meteosat Third Generation (MTG) and implementation of the African Meteorological Satellite Applications Facility (AMSAF);
- Satellite and Weather information for disaster resilience in Africa project implementation;
- Continued operationalization Regional Climate centre for Africa

## 7. Perspectives

Experiences, exchanges and lessons learnt over the four years of implementation contributed to identification of the following areas for further development:

- Strategic, operational plan for 2024-27 and related resources mobilization
- Accelerate OJT&Secondments&internships&fellowships for young experts
- Finalization of governance improvements including the AUC-ACMAD relationship agreement
- Continue operation of the RCC-Africa and Continental Multihazard Early warning system for Africa, emphasize communication enhancement
- Operationalize RARS stations, MTG and AMSAF, WIS and data centre
- Quality, risk, ethics... policies
- Undertake Pillar assessment to become EU and other donors/funds implementing partner
- Follow extension of ECMWF data access through financial support of NIMET
- Mobilize resources to sustain and expand PRs participation to COPs
- Follow mobilization of partners after COPs, DRR Fora and other high-level events
- Continue development of quality management system, impact-based forecasting, operationalize the established continental User Interface Platforms



## **ANNEX: PROTOTYPES OF NEW PRODUCTS**

**CENTRE AFRICAIN POUR  
LES APPLICATIONS DE LA METEOROLOGIE  
AU DEVELOPEMENT**



**AFRICAN CENTRE  
OF METEOROLOGICAL APPLICATIONS  
FOR DEVELOPMENT**

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Institution Africaine parrainée par la CEA et l'OMM

African Institution under the aegis of UNECA and WMO

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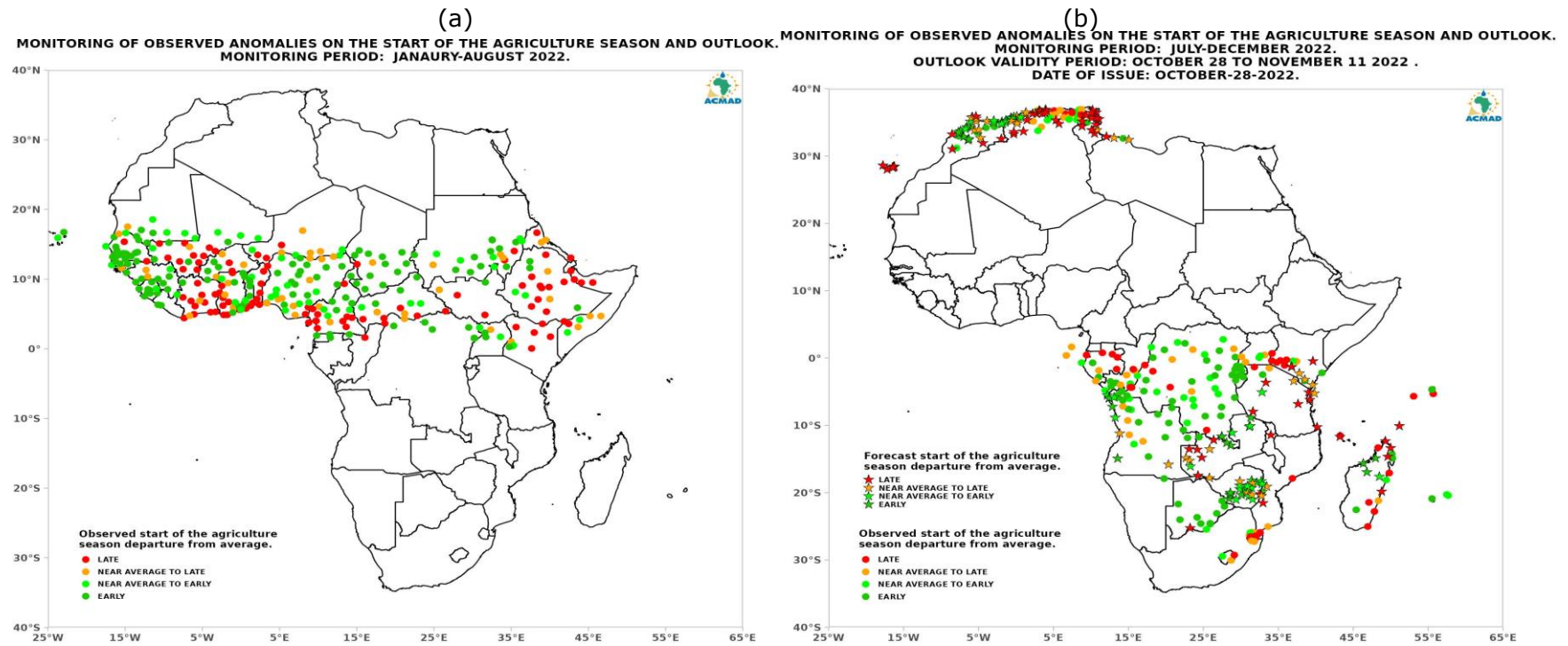


Figure 1: Start of agriculture season monitoring products

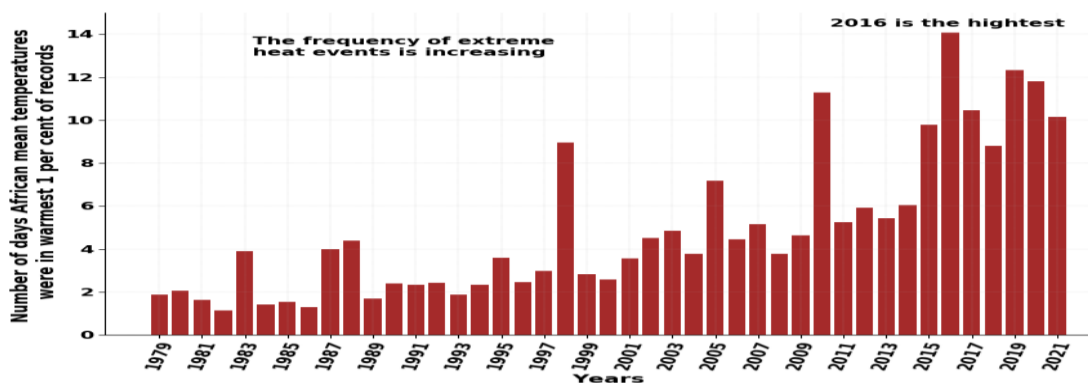


Figure 2: Number of extremely hot days in Africa

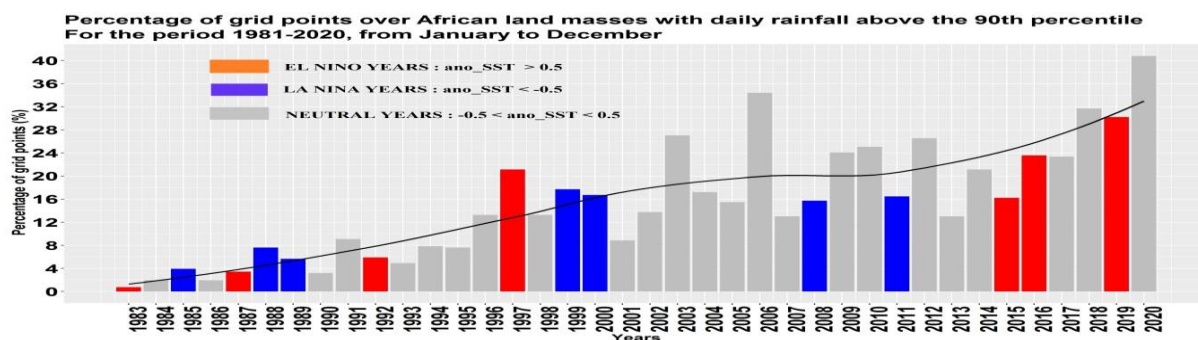


Figure 3: Surface of African land masses ( in percent of total) hit by at least one daily precipitation event above the 90<sup>th</sup> percentile each year.

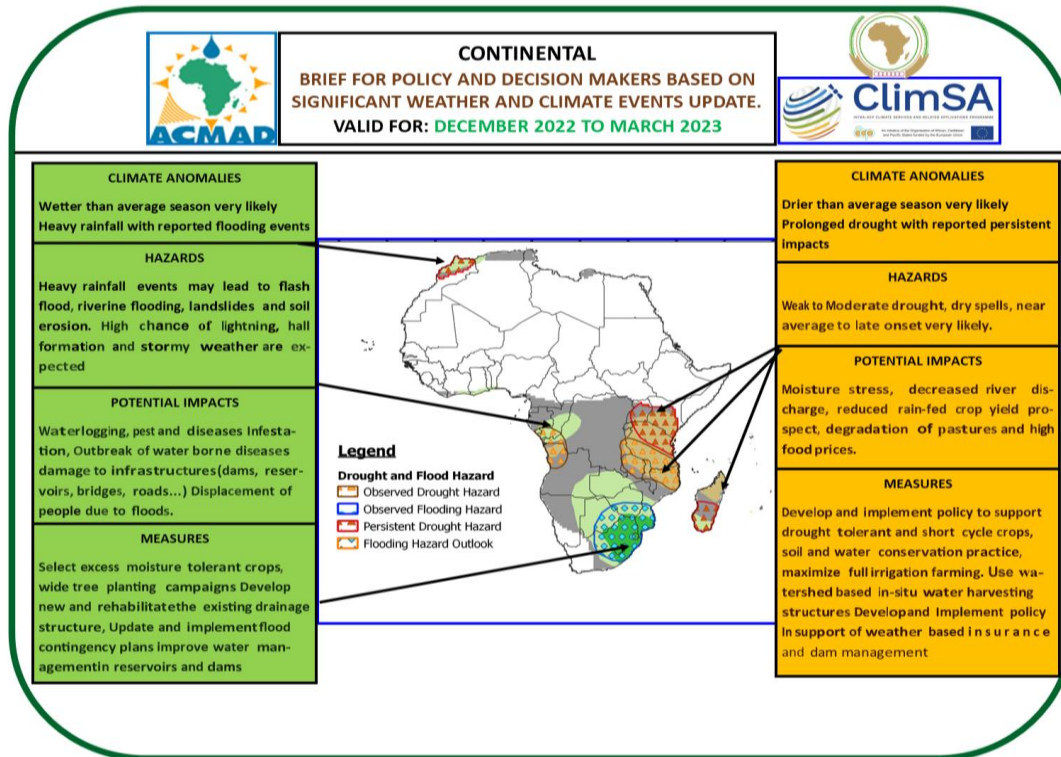


Figure 4: Impact based climate outlook indicating expected significant climate anomalies, hazards, potential impacts and proposed measures to update contingency or emergency plans

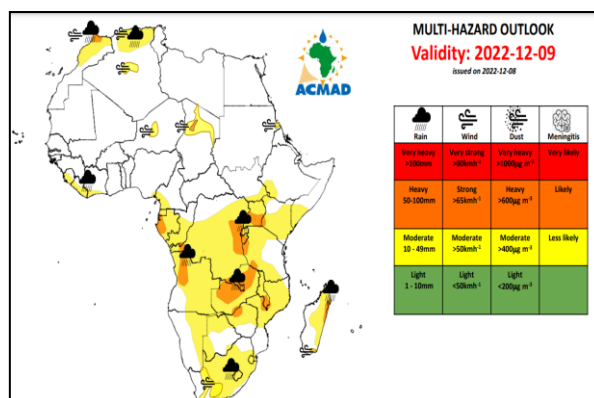


Figure 5: Vigilance products from the Continental Multi-Hazards Advisory Centre days ahead of the event.

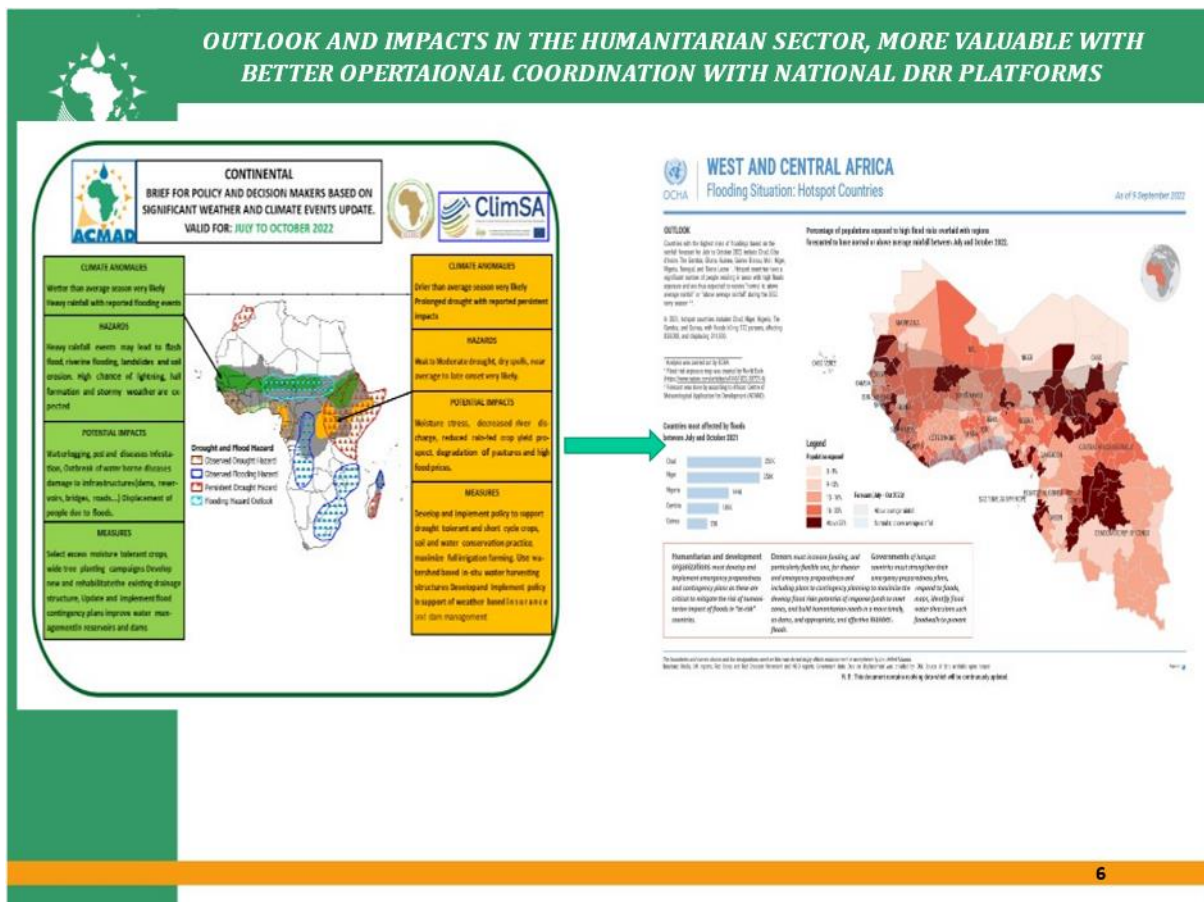


Figure 6: Impact Based forecast example with co-design and co-production between ACMAD and UNOCHA as part of the operational activities of the UIP on Climate and DRR for northern summer in 2022.

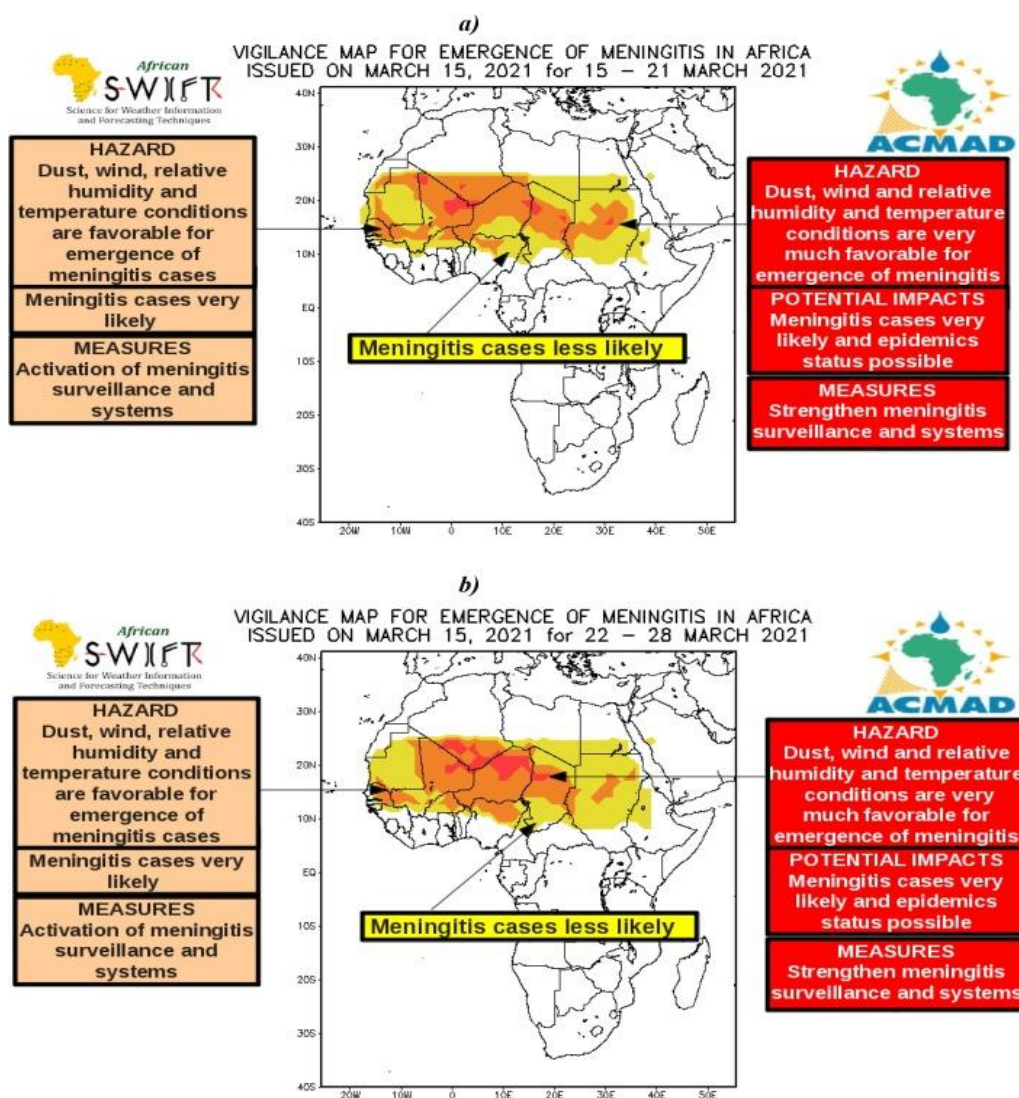


Figure 7: Impact Based forecast example with co-design and co-production between ACMAD and WHO Regional Office for Africa as part of the activities of the UIP on Climate and Health during the meningitis season in Africa.

Source: <https://www.sciencedirect.com/science/article/pii/S2405880722000449>