

Training Program on Climate Change Adaptation and Disaster Risk Reduction in Agriculture



Report of the International Conference on Climate Services for West Africa IBE-CNR Rome, Italy 4 and 5 February 2019



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1. Rationale

Climate variability and associated risks are affecting different economic sectors, and particularly food security. Sub-Saharan Africa is already facing a combination of climatic, sociological and economic challenges requiring research centers, central and local government agencies, international organizations and end-users to find new and innovative ways to interpret, apply and disseminate climate information for decision-making (Bruno Soares et al., 2016). Climate information is a valuable resource for planning and decision-making, but the challenge is to transform information to services tailored to specific users (WMO, 2011). It is a two-fold challenge: on one side acquiring the capacity to transform meteo-climatic information into useful “information products” tailored on users’ needs, on the other hand implementing training initiatives and knowledge-sharing tools to allow key users to hone their skills and competences.

In 2009, World Climate Conference-3 acknowledged **Capacity Development** as a transversal component underpinning all the other Pillars of the **Global Framework for Climate Services** (GFCS; WMO, 2014). The global scale of learning needs for climate services calls for innovative solutions, collaborative projects, a range of flexible modalities to reach learners in a variety of ways, and for sharing resources and successful strategies within the global community. Within the World Meteorological Organization (WMO) Education and Training Programme, the network of **Regional Training Centers** (RTC) play a major role in helping member countries develop operational Climate Services (CS).

According with the Status of Human Resources in National Meteorological and Hydrological Services (WMO ETR-21, 2017), unmet learning demand impacts more than 20% of the global NMHS workforce. In least developed countries (LDC) the situation is even worse because retirements (30 of 81 LDC reported that more than 30% of their staff were due to retire in the next five years). Addressing the education and training challenge will require a concerted effort by the education and training community, with the support of governments, regional development partners and the international aid, using a mix of traditional classroom, online learning, mentoring and coaching and self-guided learning methods.

Within this context, the **PACC-RRC** project was designed by WMO and two of its Regional Training Centers (AGRHYMET and IBIMET-CNR) to build the capacities of experts in National Meteorological and Hydrological Services, other national technical services, specialized agencies and other public and private institutions in the 17 member states of CILSS/ECOWAS (Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo, Mauritania and Chad).

The strategic approach of the project is to consolidate and innovate the existing sub-regional networks among national, regional and international institutions. The strategy of PACC / RRC is based on two main axes:

1. The organization of training courses for technicians and experts of National Services to develop effective climate services for Climate Change Adaptation and Disaster Risk Reduction. The main objective of the courses was to enhance the participants' abilities to plan and adopt strategies to mitigate climate and weather impacts, harmonize methods of analysis, and strengthen cooperation in these efforts at a regional level.
2. Improving the network between scientific and technical institutions to work on shared methodologies and to create and shared mechanism of knowledge management. The aim is to transfer and share expertise and knowledge, to expand cooperation in sensitive areas at national and regional levels and to promote exchanges and collaboration. Tools used for this purpose are an open access platform for knowledge and training resources management, ICT solutions for networking and distance support and finally the networking event.

Concerning the Technical and scientific knowledge on Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) of the technical services' staff of the CILSS/ECOWAS Countries, **four training courses** have been organized "Climate Services for Disaster Prevention (IBIMET-CNR, November 2017)", "Climate Services for Irrigation (AGRHYMET", February 2018), Climate change impacts and communication (IBIMET-CNR, June/July 2018) and Climate Services for rainfed crops (AGRHYMET, November 2018). The recipients improved their skills through training courses and enhanced their networking capacity through follow-up actions and post-course activities.

As a final project activity, a **networking conference** has been organized in Rome, Italy, on 4 and 5 February 2018. This report refers to the "International Conference on Climate Services for West Africa, organized in Rome, Italy on 4 and 5 February 2019.

The conference aims to gather those in high-levels of responsibility in the Ministries to which NMHS belong and coordinate with, as well as the Directors of Meteorological Services of the Region. The conference goal is to further promote the strategic collaboration of involved countries with WMO and Italy. The aim of this conference is also to enhance technical and scientific cooperation among National Meteorological Services and to promote strategic collaboration on capacity development, in the perspective of providing operational climatic services for disaster risk reduction and adaptation to climate change in agriculture and other key sectors.

During the conference, an evaluation of the training program has been conducted and a participatory process to co-design a **new collaborative capacity development initiative to support the development of Climate Services for West Africa** has been carried out with the participation of representatives of the CILSS/ECOWAS countries, of WMO, AICS, AGRHYMET, IBIMET-CNR and international experts.

2. The Conference

2.1 Organization of the Networking Conference

The organization of the Networking conference started in early July 2018.

The concept note of the conference has been prepared at the beginning of October 2018. A survey has also been prepared to be sent to participants with the invitation: PACC-RRC Conference - Survey on Capacity Development for Climate Services. This survey aimed to provide the context and the justification for a future collaborative initiative on capacity development supporting the operational implementation of Climate Services in West Africa.

WMO sent the Announcement to the Networking Conference to PRs at the end of November 2018, and by the end of December the final list of participants was established.

Country	Nominated By	Nominated participants
Benin	Mr Marcellin Kokou NAKPON	Mr Marcellin Kokou NAKPON (PR)
Burkina Faso	Mr Kouka Ernest OUEDRAOGO	Mr Kouka Ernest OUEDRAOGO (PR)
Burkina Faso	Mr Kouka Ernest OUEDRAOGO	Mr Florent BAKOUAN
Cabo Verde	Ms Maria da Cruz Soares	Ms Denise SEMEDO DE PINA
Cabo Verde	Maria da Cruz Soares	Mr Francisco DA VEGA CORREIA

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Chad	Mr Jules Dandjaye DAOUNA	Mr Daoua Jules Dandjaye (PR)
Chad	Mr Jules Dandjaye DAOUNA	Nembontar Djekoula Midebel
Cote d'Ivoire	Mr Daouda KONATE	Mr Daouda Konate (PR)
Cote d'Ivoire	Mr Daouda KONATE	Mr Koffi Rodrigue N'Guessan
Gambia	Mr Lamin Mai TOURAY	Mr Lamine Mai Touray (PR)
Ghana	Dr Michael MAWUTOR TANU	Mr Michael Mawutor Tanu (PR)
Guinea	Dr Mamadou Lamine BAH	Mr Yaya Bangoura
Guinea	Dr Mamadou Lamine BAH	Mrs Houssainatou Barry
Guinea-Bissau	Dr João Lona TCHEDNÁ	Mr Fernando Baial Sambu
Liberia	Mr Arthur GAR-GLAHN	Mr Arthur Gar-Glahn (PR)
Liberia	Mr Arthur GAR-GLAHN	Hon. D. Caesar Freeman, II
Mali	Mr Djibrilla Ariaboncana MAIGA	Mr Mamadou Samake
Mauritania	Mr Mohamed Batta CHEIKH MOHAMD EL MAMY	Mr Mohamed Batta CHEIKH MOHAMD EL MAMY (PR)
Mauritania	Mr Mohamed Batta CHEIKH MOHAMD EL MAMY	Mr. Mamadou Lam
Niger	Mr Moussa LABO	Ms Aissatou Sitta
Niger	Mr Moussa LABO	Mr Amadou Diallo Issifi
Nigeria	Prof. Sani Abubakar MASHI	Prof. Sani Abubakar Mashi (PR)
Nigeria	Prof. Sani Abubakar MASHI	Ahmad Abdullahi Bello
Senegal	Mr Magueye Maramé NDAO	Oumar Konté
Senegal	Mr Magueye Maramé NDAO	Bounama Dièye
Sierra Leone	Mr Ibrahim Sinneh KAMARA	Mr Ibrahim Sinneh Kamara (PR)
Sierra Leone	Mr Ibrahim Sinneh KAMARA	Mr Gabriel Kpaka
Togo	Mr Latifou ISSAOU	Dr Latifou Issaou (PR)
Togo	Mr Latifou ISSAOU	Mr Rahim Ouro-Salim
Nigeria	WMO/IBIMET	Prof Emmanuel Oladipo
ECOWAS	n/a	Mr Johnson Boanuh
CILSS	n/a	Mr Ibrahim Lumumba IDI-ISSA (Vice Executive Secretary)
Cote d'Ivoire	IBIMET	Ms Veronique Bomo MANOUAN
Guinea-Bissau	AGRHYMET	Mr Orlando MENDES
Cabo Verde	IBIMET	Ms Maria Alexandrina Mendes Martins Gomes Moreno
Benin	AGRHYMET	Ms Houefa Valerie SOUNOUE
WMO staff	WMO	Yinka Adebayo
WMO staff	WMO	Patrick Parrish
WMO staff	WMO	Robert Stefanski
WMO staff	WMO	Bernard Gomez
Slovenia	IBIMET	Tanja CEGNAR
UK	IBIMET	Carlo BUONTEMPO
AGRHYMET	AGRHYMET	Dr. Souleymane OUEDRAOGO
AGRHYMET	AGRHYMET	Dr. Moussa WAONGO

Meanwhile, IBIMET started the procedures for acquiring the goods and services needed for the conference, such as transportation tickets, accommodation, coffee breaks and lunches, dinner and so on.

The conference was held in the historical conference hall of CNR headquarters in Rome. The programme was organized in two days (Annex 1). Lunches and Coffee breaks have been organized at CNR, while a social dinner was organized at the restaurant Casa dell'Aviatore.



Despite some last-minute issues with visas and flights almost all participants arrived in Rome. Participants that could not attend have been:

- Mrs Houssainatou Barry – Guinea
- Mr Amadou Diallo Issifi – Niger
- Mr Ahmad Abdullahi Bello – Nigeria
- Mr Ibrahim Sinneh Kamara – Sierra Leone

2.2. The International Conference on Climate Services for West Africa

The Conference brought together 76 participants from 21 countries, including representatives of 3 embassies and 6 international organizations. The event was designed to provide a venue for decision makers and experts in the project region to discuss outcomes, examine continue needs, and consider follow-on capacity development initiatives.

2.2.1 First Day

The Opening Session was characterized by the interventions of Dr Francesco Loreto, Director CNR-DISBA, Dr Antonio Raschi, Director CNR-IBIMET, Dr Marina Baldi, Director RTC in Italy, the Minister Roberto Colaminé, Director of the Territorial office for Africa at MAECI-DGCS, Dr. Mauro Pedalino, representing AICS, B.Gen. Silvio Cau, WMO-PR of Italy, Director of the Italian Met Service, Dr Ibrahim Lumumba IDI-ISSA, Vice Executive Secretary of CILSS, Mr Lamin Touray, Chair of West African WMO PRs and Dr Yinka Adebayo, Chief of the WMO Education and Training Office.



The second session was dedicated to the presentation of the PACC.RRC project, including didactical activities, distance Learning and new technologies activities and feedbacks from trainers and participants.

After the presentation of the PACC-RRC Programme, the discussion was focused on the lessons learnt.

The good practices implemented by the project are:

- Collaboration Multidisciplinarity
- Connectivism
- Innovation in education approach
- Technical-scientific network and huge trainers' team
- Good balance between science and operational services
- Working in groups
- Case studies
- Mentoring and post workshop activities
- Customization of Moodle platform and Mobile solutions
- Valorization and re-use of training resources
- Interoperability of DL

The main problems the project had to face have been:

- Language gap
- Skill of participants
- Internet
- Time to complete the Distance Learning
- Engagement in the Post workshop
- Usability and low users experience

The recommendation coming from the project are:

- Off line solutions for distance learning
- More time for DL,
- More time to practical sessions using case studies,
- Case studies on real data
- Field trips,
- Improve sharing initiatives between participants
- Improve Moodle deployment on a Knowledge and Skills basis
- Increase the number of participants for distance learning
- Mitigate the language gap without investing in it too much resources
- Making available the training materials to all the students of all the courses
- Improve sustainability of training by sharing resources
- Language gap to be considered in recruitment process of NMHSs.
- Strengthening of NMHSs in terms of Internet

The following session of the first day was dedicated to the presentation of posters by the four students that have been selected among one hundred that participated in the different courses.

The final very useful and interesting session was the one dedicated to Climate Services and capacity development in West Africa, experience from the NMHSs.

The session started with the Chairperson requesting heads of delegation and their counterparts from the climate user sectors to share their experiences with regard to the products they generate as well as their capacities and limitations to meet the needs of the users.

Mali:

- Shared experience in Mali Meteo's support to rural communities in agricultural production in providing information on sowing dates, dry spell occurrence, rainfall onset and cessations dates, season length, etc.
- Requests WMO/IBIMET to support in the production of real time products
- Requests WMO/IBIMET to support provision of Climate Services, that is through adding value to climate data.

Benin:

- Conducted roving seminars with farmers
- Limitations in forecast accuracy due to absence of radar equipment
- Need for new meteo-media equipment compatible with modern public broadcasting systems

Togo:

- National Framework for Climate Services (NFCS) launched but not yet validated
- Currently producing and disseminating daily, weekly and monthly weather bulletins on radio and other media
- Request for capacity development (professional and specialized courses) for enhanced climate services' production.

Burkina Faso

- Piloted implementation of NFCS since 2012
- Impressive climate observing network with around 300 Automatic Weather Stations (though encountering challenges of sustenance)
- Currently benefitting from several sponsored projects, some of which are providing training to end-users
- Provision of weekly information bulletin to Council of Ministers
- Recommend the transformation to agencies NMHSs to allow them generate revenue

Ghana:

- Support farmers with Seasonal Rainfall Outlook (SRO)
- Information given in local languages, using Head Farmers to relay information to other farmers
- Have a slot on national TV for weather forecast
- Collaboration with University of Ghana to provide weather forecasts for fisherfolks

Senegal:

- Presence of strong Multidisciplinary Working Group for climate applications
- Provision of SRO annually
- Information provided is relevant despite gaps in needs

Cote d'Ivoire:

- No MWG or EWS!
- Request tools for crop monitoring to be adapted to local needs

Niger:

- Echoed the need for training (professional & specialized) to replace retired personnel
- Request for capacity development to build the requisite capabilities to provide climate services for Disaster Risk Management, Health, Energy sectors that NMHSs are not currently equipped to do.

- Request to replace obsolete equipment

Guinea:

- Need for capacity development to meet the needs of users
- New partnership with private sector to provide AWS instead of charging for data supply

Cabo Verde:

- Monitoring climate and geophysical hazards
- Provision of daily weather bulletins including warning

2.2.2 Second Day

The second day was mainly dedicated to the discussion on needs and options for a new capacity development initiative, and to the production of a final statement.

The Conference Statement (Annex 2) includes acknowledgement of the successes of the project, areas for improvement, and a commitment to seek additional opportunities and resources to build upon the project outcomes.

The second day started with four speech on **Climates Services for West Africa, including the** Keynote speaker Carlo Buontempo of ECMWF, an intervention on Climate Services and public policies by Prof. Olukayode Oladipo – University of Lagos, a speech by Dr. Patrick Parrish of WMO on the perspectives of distance learning for Climate Services and finally an overview of GFCS and WMO projects and initiatives in the region by Robert Stefanski of WMO.

The following session was a general discussion on needs and options for a new capacity development initiative introduced by Dr. Yinka Adebayo of WMO with a speech on Capacity development through WMO education and training activities. The general discussion focused on climate services in West Africa particularly on Existing services, Needs and resources, Public policy and institutional matters, Approaches to capacity development and Partnerships and cooperation.

The contents for the new initiative, following the outcomes and recommendations of the SYMET-13 (WMO No.1219, 2018), aim to foster cooperation, providing a solid foundation for increased sharing of training resources and approaches, offering learning opportunities, developing model or common accreditation, certification, evaluation and assessment systems. The new initiative will contribute to the operational implementation of the WMO Global Campus, encouraging multilateral collaboration among RTCs and other training institutions and by providing a shared and open platform for sharing training contents, tools and learning technologies that all providers and users could use.

The next session was dedicated to the finalization and **approval of the Conference Statement**.

Finally, the **conference was closed by the interventions of** the Director of IBIMET, Dr Antonio Raschi, the Director of the Regional Training Center in Italy, Dr Marina Baldi, the Chair of West African WMO Permanent Representatives, Mr Lamin Touray and the Chief of the WMO Education and Training Office, Dr Yinka Adebayo.



3. Final Statement of the Conference

STATEMENT OF THE NETWORKING CONFERENCE "CLIMATE SERVICES FOR WEST AFRICA", PACC-RRC PROJECT

3.1 Background

Program on Climate Change Adaptation and Disaster Risk Reduction in Agriculture (PACC/RRC) project was carried out between 2016 and 2019 with the overall objective of reducing the impacts of climate change and natural disasters in the agricultural sector in West Africa. The project is led by the World Meteorological Organization and implemented in collaboration with the two Regional Training Centers (RTCs) of WMO, the Institute of Biometeorology of the Italian National Research Council (CNR-IBIMET) and the AGRHYMET Regional Center (CILSS / ECOWAS in Niger). Capacity development through training is the core thrust of the project. A Networking Conference on "Climate Services For West Africa" was, held in Rome, Italy, from 4 to 5 February 2019, as an activity of the PACC-RRC project. The Networking Conference was attended by 76 participants from 21 countries, representatives of 3 embassies and 6 international organizations.

In deliberating on Education and Training for Human Resources Development in Meteorological and Hydrological Services to deliver climate services, participants appreciate the strategic collaboration developed among CILSS/ECOWAS member countries with WMO and the WMO RTCs IBIMET/CNR and AGRHYMET,

Results and the feedbacks from the four training courses organized at IBIMET-CNR and at AGRHYMET Regional Center in 2017 and 2018, within the PACC-RRC Programme form the core of substantive results of the project deliberated upon at the conference.

The Conference took note of the various international and national initiatives and commitments to address global issues related to climate change and natural disasters, the Global Framework for Climate Services, the Paris Agreement, the AU Agenda 2063, the ECOWAS Environmental Policy and its hydrometeorology programme, the 2030 Agenda for

Sustainable Development and the Sendai Framework for Disaster Risk Reduction, as well as other major initiatives and issues that are driving change within the WMO community for the wider education and training sector in favor of the socio-economic security of West Africa.

It also recognized that capacity development for climate services should encompass all elements of the climate services value chain, from climate data management, climate monitoring and prediction, to service delivery and communication of relevant products to end-users, in compliance with the highest quality management standards.

Attention was also paid to the agreed key thematic areas requiring further development to enable the WMO Education and Training community to address the increasing education and training requirements, as contained in the outcomes and recommendations of the SYMET-13 (WMO No.1219, 2018).

3.2 Observations and conclusions

Following feedback received from participants in the four training courses organized within the project, Survey on Capacity Development for Climate Services, extensive deliberation on the outcome of the project activities, and the need for follow-up activities, the participants arrived at the following observations and conclusions:

1. The PACC-RRC Training Programme met the expectations of the project as far as capacity building and promotion of networking are concerned.
2. The education solutions proposed by the project are considered appropriate, more so as they have opened the way to new solutions by recognizing and delivering competency-based training approaches to capacity development of individual experts.
3. NMHSs are already engaged in the delivery of an increasing number of climate services for specific sectors/users, but in order to provide the range of climate services needed to attain sustainable development and disaster risk reduction goals, increased funding is required to support the initial and ongoing education and training of NMHS personnel.
4. NMHSs face a growing deficit in the capability and numbers of adequately educated and trained staff.
5. Technical and language skills of nominated candidates for the training courses are often not adequate to fully benefit from the training.
6. Weak internet connection is a key limiting factor for distance learning in some countries.
7. Rapid advances in scientific innovation and technological developments, as well as the growing availability of climate services and climatic datasets by international centers require corresponding update training of NMHS personnel.
8. Some good practices arose from the implementation of the PACC-RRC program, such as:
 - i) participants had the opportunity to get in touch with a consolidated network of institutions and trainers operating in the region,
 - ii) case studies developed by working groups using real data from participating countries in the practical sessions demonstrated to be very useful in the learning approach,
 - iii) networking and knowledge transfer are uppermost efficient in building capacities and engagement,

- iv) tutoring in both, French and English, languages during the practical sessions is an efficient way to reduce the language gap,
- v) post workshop activities in the home countries (i.e. sharing knowledge and analysis) are a good indicator of participants' commitment,
- vi) if participants are engaged, a multiplier effect can be obtained by organizing "structured training initiatives" in their institutions.

9. The development of the WMO competency and qualification frameworks, particularly those related to the provision of climate services, and their inclusion in the WMO Technical Regulations have raised the importance of, and support for, education and training within NMHSs.

10. Cooperation among RTCs, Research Centers, Universities, Regional and International Organizations, such as that developed within the PACC-RRC Program, provides a solid foundation for the following:

- i) increased sharing of teaching and learning resources and approaches;
- ii) collaboration on development and delivery of education and training opportunities;
- iii) developing model or common accreditation, certification, evaluation and assessment systems and their underlying quality control procedures;
- iv) and shared tools and platforms for developing, delivering, monitoring and reporting on education and training activities.

11. Recognized that the new initiative, following the outcomes and recommendations of the SYMET-13 (WMO-No. 1219, 2018), might foster such cooperation, providing a solid foundation for increased sharing of training resources and approaches, offering learning opportunities, and developing model or common accreditation, certification, evaluation and assessment systems.

12. The new initiative will contribute to the operational implementation of the WMO Global Campus, encouraging multilateral collaboration among RTCs and other training institutions and by providing a shared and open platform for sharing training contents, tools and learning technologies that all providers and users can use.

3.3 Recommendations

1. There is the need for continuous learning through an appropriate capacity-development programme adopting a blended solution of IT/distance learning and face-to-face workshops.
2. It is important to ensure application of knowledge with hands-on sessions for practical learning of tools and software.
3. Need for recognition of the demand by stakeholders for customized learning paths based on competencies, among which the priorities as identified by participants should be:
 - i) Derive products from climate data: Climate data products are derived from different sources of climate data such as observed and reconstructed time series, reanalysis, satellite and modelled data, applying statistics which describe their spatial and temporal characteristics;

- ii) Create and/or interpret weather and climate forecasts and model outputs: Climate data, climate data products and weather and climate model outputs are operated and used to create sub-seasonal and seasonal climate forecasts and future climate projections;
 - iii) Communicate climatological information with users: Climate science, data and products are communicated to policy makers, stakeholders and the general public based on their varied needs;
 - iv) Create and manage climate data sets: Climate data, metadata and climate data products are gathered and stored in datasets, quality controlled and assessed for homogeneity;
 - v) Ensure the quality of climate information and services: Climate information and services are defined and routinely updated. Best practices are followed, guidelines and quality management procedures are created and routinely maintained for developing and communicating climate information, and monitoring processes of the climate services are documented and used in quality control activities.
4. Need to link with Climate Services activities developed by the Copernicus EU initiative and to be actively involved in the co-development of such services for West Africa, particularly (in order of priority): i) Water, ii) Agriculture, iii) Energy, iv) Health and v) Insurance.
5. Need to recognize the following themes as priorities: Seasonal climate forecasts, agrometeorological applications, climatology, climate forecasts downscaling and bias correction, climate information communication, GIS and remote sensing, databases, R software environment, Python programming language.
6. Importance of paying attention to the following priority sectors: Water, Agriculture, Energy, Health, DRR, Insurance, Drought and Land degradation and to strengthen the capacities of their actors to benefit from the climate services delivered.
7. Request WMO to provide, with the support of the Italian Government and other International stakeholders, for the setting up of a new project to enhance technical and scientific cooperation among CILSS/ECOWAS NMHSs and to promote strategic collaboration on capacity development, in the perspective of providing operational climate services for disaster risk reduction and adaptation to climate change in agriculture and other key sectors.
8. Recognizing the impacts the PACC-RRC project has made, as evident in the outputs presented during the Networking Conference in Rome, 4-5 February 2019, it is requested that all stakeholders, especially policy makers, national and regional institutions, and development partners, utilize the outcomes of this inaugural project as inputs to formulate and promote new capacity development initiatives, in as many ways as possible.

3.4 Appreciation

The participants expressed their gratitude to the Government of Italy for hosting the Conference, to WMO, CILSS/AGRHYMET and ECOWAS for promoting the event, to the Institute of Biometeorology of the National Research Council of Italy for organizing it, and to the Italian Ministry of Foreign Affairs and International Cooperation – Directorate General for Development Cooperation - and the Italian Agency for Development Cooperation for providing the resources that made it possible.

Rome, Italy, 5 February 2019.

Annex 1, Programme of the conference

February 4th, 2019

09.00 - 10.00 **Opening Session**

- Prof Massimo Inguscio, President CNR (tbc)
- Dr Francesco Loreto, Director CNR-DISBA
- Dr Antonio Raschi, Director CNR-IBIMET
- Dr Marina Baldi, Director RTC in Italy
- Min. Roberto Colaminé, MAECI-DGCS
- Dr. Mauro Pedalino, AICS
- B.Gen. Silvio Cau, WMO-PR of Italy, Servizio Meteorologico dell'Aeronautica Militare
- Dr Souleymane Ouedraogo, Director General AGRHYMET
- Mr Jonson Boanuh, ECOWAS Secretariat
- Mr Lamin Touray, Chair of West African WMO PRs
- Dr Yinka Adebayo, WMO Education and Training Office

10.00 – 10:30 Coffee-Break

10:30 – 12:00 **PACC-Programme** (Chair: Marina Baldi - IBIMET-CNR; Rapporteurs M. Waongo - AGRHYMET, V. Tarchiani – IBIMET)

- WMO (Patrick Parrish)
- IBIMET (Vieri Tarchiani)
- AGRHYMET (Moussa Waongo)
- Feedbacks and consideration from PACC-RRC courses:
 - Didactical activities (Maurizio Bacci – IBIMET)
 - The view of trainers (Massimiliano Pasqui – IBIMET)
 - Distance Learning and new technologies activities (Elena Rapisardi - IBIMET)
- Feedbacks from participants:
 - Ms Veronique Bomo Manouan – Cote d'Ivoire
 - Mr Orlando Mendes – Guinea-Bissau
 - Ms Maria Alexandrina Mendes Martins Gomes Moreno – Cabo Verde
 - Ms Houefa Valerie Sounouke - Benin

12:00 -13.00 **Lessons learnt from PACC** (Chair: Abubakar Mashi - PR Nigeria; Rapporteurs Moussa Waongo - AGRHYMET, Vieri Tarchiani – IBIMET)

Synthesis (30 min) and discussion (30 min)

13.00 – 14.00 Lunch

14:00 - 15:00 **Presentation of posters** by the students (Chair: Massimiliano Pasqui – IBIMET-CNR):

- Ms Veronique Bomo Manouan – Cote d'Ivoire
- Mr Orlando Mendes – Guinea-Bissau
- Ms Maria Alexandrina Mendes Martins Gomes Moreno – Cabo Verde
- Ms Houefa Valerie Sounouke – Benin

15:00 – 15:30 *Coffee break*

15:30 -17.00 **Round Table: Climate Services and capacity development in West Africa, experience from the NMHSs** (Chair: Daouda Konate PR Cote d'Ivoire; Rapporteur: Bernard Gomez – WMO)

February 5th, 2019

09.00 – 10.15 **Climates Services for West Africa** (Chair: Dr Souleymane Ouedrago - AGRHYMET)

- Keynote speaker: Carlo Buontempo - ECMWF (30 min)
- Climate Services and public policies: Prof. Olukayode Oladipo – University of Lagos, Nigeria (15 min)
- Perspectives of distance learning for Climate Services: Patrick Parrish - WMO (15 min)
- GFCS and WMO projects and initiatives in the region: Robert Stefanski – WMO (15 min)

10.15 – 10.45 *Coffee-Break*

10.45 – 13.00 **Discussion on needs and options for a new capacity development initiative** (Chair: Tanja Cegnar – Slovenian Environment Agency; Rapporteurs: Bernard Gomez and Patrick Parrish – WMO; Vieri Tarchiani – IBIMET-CNR)

Capacity development through WMO education and training activities: Yinka Adebayo - WMO (15 min)

General discussion

- Climate services in West Africa:
 - Existing services
 - Needs and resources
 - Public policy and institutional matters
 - Approaches to capacity development
 - Partnerships and cooperation
- Contents for the new initiative

13.00 – 14.00 *Lunch*

14.30 – 15.30 **Conclusion and follow-up activities and approval of the Conference Statement** (Chair: Lamin Touray PR Gambia; Rapporteur: Robert Stefanski - WMO)

15.30 – 16.30 **Closure**

- Director IBIMET, Dr Antonio Raschi
- Director Regional Training Center in Italy, Marina Baldi
- Chair of West African WMO Permanent Representatives, Lamin Touray
- Italian Ministry of Foreign Affairs (tbc)
- Italian Agency for Development Cooperation (tbc)
- WMO Education and Training Office, Dr Yinka Adebayo

Annex 2, List of participants

Participant	Country	Institution	E-mail
Mr Marcellin Kokou NAKPON (PR)	Benin	Meteo Benin	marcellin.nakpon@gmail.com
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Mr Florent BAKOUAN	Burkina Faso	Conseil National de Secours d'Urgence et de Réhabilitation	bakiflo@gmail.com
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Annex 3, Final statement

STATEMENT OF THE NETWORKING CONFERENCE “CLIMATE SERVICES FOR WEST AFRICA”, PACC-RRC PROJECT

Background

Program on Climate Change Adaptation and Disaster Risk Reduction in Agriculture (PACC/RRC) project was carried out between 2016 and 2019 with the overall objective of reducing the impacts of climate change and natural disasters in the agricultural sector in West Africa. The project is led by the World Meteorological Organization and implemented in collaboration with the two Regional Training Centers (RTCs) of WMO, the Institute of Biometeorology of the Italian National Research Council (CNR-IBIMET) and the AGRHYMET Regional Center (CILSS / ECOWAS in Niger). Capacity development through training is the core thrust of the project. A Networking Conference on “Climate Services For West Africa” was held in Rome, Italy, from 4 to 5 February 2019, as an activity of the PACC-RRC project. The Networking Conference was attended by 76 participants from 21 countries, representatives of 3 embassies and 6 international organizations.

In deliberating on Education and Training for Human Resources Development in Meteorological and Hydrological Services to deliver climate services, participants appreciate the strategic collaboration developed among CILSS/ECOWAS member countries with WMO and the WMO RTCs IBIMET/CNR and AGRHYMET,

Results and the feedbacks from the four training courses organized at IBIMET-CNR and at AGRHYMET Regional Center in 2017 and 2018, within the PACC-RRC Programme form the core of substantive results of the project deliberated upon at the conference.

The Conference took note of the various international and national initiatives and commitments to address global issues related to climate change and natural disasters, the Global Framework for Climate Services, the Paris Agreement, the AU Agenda 2063, the ECOWAS Environmental Policy and its hydrometeorology programme, the 2030 Agenda for Sustainable Development and the Sendai Framework for Disaster Risk Reduction, as well as other major initiatives and issues that are driving change within the WMO community for the wider education and training sector in favor of the socio-economic security of West Africa.

It also recognized that capacity development for climate services should encompass all elements of the climate services value chain, from climate data management, climate monitoring and prediction, to service delivery and communication of relevant products to end-users, in compliance with the highest quality management standards.

Attention was also paid to the agreed key thematic areas requiring further development to enable the WMO Education and Training community to address the increasing education and training requirements, as contained in the outcomes and recommendations of the SYMET-13 (WMO No.1219, 2018).

Observations and conclusions:

Following feedback received from participants in the four training courses organized within the project, Survey on Capacity Development for Climate Services, extensive deliberation on the outcome of the project activities, and the need for follow-up activities, the participants arrived at the following observations and conclusions:

- 1) The PACC-RRC Training Programme met the expectations of the project as far as capacity building and promotion of networking are concerned.

- 2) The education solutions proposed by the project are considered appropriate, more so as they have opened the way to new solutions by recognizing and delivering competency-based training approaches to capacity development of individual experts.
- 3) NMHSs are already engaged in the delivery of an increasing number of climate services for specific sectors/users, but in order to provide the range of climate services needed to attain sustainable development and disaster risk reduction goals, increased funding is required to support the initial and ongoing education and training of NMHS personnel.
- 4) NMHSs face a growing deficit in the capability and numbers of adequately educated and trained staff.
- 5) Technical and language skills of nominated candidates for the training courses are often not adequate to fully benefit from the training.
- 6) Weak internet connection is a key limiting factor for distance learning in some countries.
- 7) Rapid advances in scientific innovation and technological developments, as well as the growing availability of climate services and climatic datasets by international centers require corresponding update training of NMHS personnel.
- 8) Some good practices arose from the implementation of the PACC-RRC program, such as:
 - i) participants had the opportunity to get in touch with a consolidated network of institutions and trainers operating in the region,
 - ii) case studies developed by working groups using real data from participating countries in the practical sessions demonstrated to be very useful in the learning approach,
 - iii) networking and knowledge transfer are uppermost efficient in building capacities and engagement,
 - iv) tutoring in both, French and English, languages during the practical sessions is an efficient way to reduce the language gap,
 - v) post workshop activities in the home countries (i.e. sharing knowledge and analysis) are a good indicator of participants' commitment,
 - vi) if participants are engaged, a multiplier effect can be obtained by organizing "structured training initiatives" in their institutions.
- 9) The development of the WMO competency and qualification frameworks, particularly those related to the provision of climate services, and their inclusion in the WMO Technical Regulations have raised the importance of, and support for, education and training within NMHSs.
- 10) Cooperation among RTCs, Research Centers, Universities, Regional and International Organizations, such as that developed within the PACC-RRC Program, provides a solid foundation for the following:
 - i) increased sharing of teaching and learning resources and approaches;
 - ii) collaboration on development and delivery of education and training opportunities;
 - iii) developing model or common accreditation, certification, evaluation and assessment systems and their underlying quality control procedures;
 - iv) and shared tools and platforms for developing, delivering, monitoring and reporting on education and training activities.

- 11) Recognized that the new initiative, following the outcomes and recommendations of the SYMET-13 (WMO-No. 1219, 2018), might foster such cooperation, providing a solid foundation for increased sharing of training resources and approaches, offering learning opportunities, and developing model or common accreditation, certification, evaluation and assessment systems.
- 12) The new initiative will contribute to the operational implementation of the WMO Global Campus, encouraging multilateral collaboration among RTCs and other training institutions and by providing a shared and open platform for sharing training contents, tools and learning technologies that all providers and users can use.

Recommendations:

- 1) There is the need for continuous learning through an appropriate capacity-development programme adopting a blended solution of IT/distance learning and face-to-face workshops.
- 2) It is important to ensure application of knowledge with hands-on sessions for practical learning of tools and software.
- 3) Need for recognition of the demand by stakeholders for customized learning paths based on competencies, among which the priorities as identified by participants should be:
 - i) Derive products from climate data: Climate data products are derived from different sources of climate data such as observed and reconstructed time series, reanalysis, satellite and modelled data, applying statistics which describe their spatial and temporal characteristics;
 - ii) Create and/or interpret weather and climate forecasts and model outputs: Climate data, climate data products and weather and climate model outputs are operated and used to create sub-seasonal and seasonal climate forecasts and future climate projections;
 - iii) Communicate climatological information with users: Climate science, data and products are communicated to policy makers, stakeholders and the general public based on their varied needs;
 - iv) Create and manage climate data sets: Climate data, metadata and climate data products are gathered and stored in datasets, quality controlled and assessed for homogeneity;
 - v) Ensure the quality of climate information and services: Climate information and services are defined and routinely updated. Best practices are followed, guidelines and quality management procedures are created and routinely maintained for developing and communicating climate information, and monitoring processes of the climate services are documented and used in quality control activities.
- 4) Need to link with Climate Services activities developed by the Copernicus EU initiative and to be actively involved in the co-development of such services for West Africa, particularly (in order of priority): i) Water, ii) Agriculture, iii) Energy, iv) Health and v) Insurance.
- 5) Need to recognize the following themes as priorities: Seasonal climate forecasts, agrometeorological applications, climatology, climate forecasts downscaling and bias correction, climate information communication, GIS and remote sensing, databases, R software environment, Python programming language.
- 6) Importance of paying attention to the following priority sectors: Water, Agriculture, Energy, Health, DRR, Insurance, Drought and Land degradation and to strengthen the capacities of their actors to benefit from the climate services delivered.
- 7) Request WMO to provide, with the support of the Italian Government and other International stakeholders, for the setting up of a new project to enhance technical and scientific cooperation

among CILSS/ECOWAS NMHSs and to promote strategic collaboration on capacity development, in the perspective of providing operational climate services for disaster risk reduction and adaptation to climate change in agriculture and other key sectors.

- 8) Recognizing the impacts the PACC-RRC project has made, as evident in the outputs presented during the Networking Conference in Rome, 4-5 February 2019, it is requested that all stakeholders, especially policy makers, national and regional institutions, and development partners, utilize the outcomes of this inaugural project as inputs to formulate and promote new capacity development initiatives, in as many ways as possible.

Appreciation

The participants expressed their gratitude to the Government of Italy for hosting the Conference, to WMO, CILSS/AGRHYMET and ECOWAS for promoting the event, to the Institute of Biometeorology of the National Research Council of Italy for organizing it, and to the Italian Ministry of Foreign Affairs and International Cooperation – Directorate General for Development Cooperation - and the Italian Agency for Development Cooperation for providing the resources that made it possible.

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