REPORT OF THE 13TH EUMETSAT USER FORUM IN AFRICA

24-28 September 2018 - Abidjan

EUMETSAT

SODEXAM

EUMETSAT USER FORUM IN AFRICA

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Organised by EUMETSAT
in collaboration with the Société d'Exploitation et de Développement Aéroportuaire, Aéronautique et Météorologique (SODEXAM), under the Ministry of Transports of the Republic of Côte d'Ivoire.

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In memory of Antoine Royer,
our thoughts are with his family, colleagues and friends

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EXECUTIVE SUMMARY

INTRODUCTION

The 13th EUMETSAT User Forum in Africa was organised in Abidjan, Côte d'Ivoire, by EUMETSAT, in collaboration with the SODEXAM, under the Ministry of Transports of the Republic of Côte d'Ivoire.

The Forum was held from 24 to 28 September 2018 with some 166 participants representing 59 countries, of which 51 were African.

The purpose of the EUMETSAT User Forum in Africa is to sustain the well-established dialogue between EUMETSAT and the African user community, in particular the National Meteorological Services and their regional centres, and to provide a platform for these users to discuss about the exploitation of EUMETSAT and other satellite data in various applications areas. The overall objective is to facilitate the use of EUMETSAT satellite data throughout the continent, in support to sustainable development.

The programme of the 13th EUMETSAT User Forum in Africa included an Opening Ceremony, seven plenary sessions, two working group sessions, a technical visit, an exhibition area and a closing ceremony. The Forum was the opportunity to identify actions and initiatives that could be taken by EUMETSAT and its partners to meet the requirements of the African users. These actions are captured in sixteen recommendations, sorted out by topics (see Recommendations section).

PARTICIPANTS

The Forum was attended by representatives of African National Meteorological and Hydrological Services (NMHSs) and specialised regional institutions for Meteorology, Climate and Environment. Regional policy institutions were also represented at the Forum, notably representative of several Regional Economic Communities (RECs), from the African Union Commission (AUC) and the African Ministerial Conference on Meteorology (AMCOMET).

In addition to the Ministry of Transports, several Ivorian entities were also represented such as the Centre d'Information Géographique et du Numérique (CIGN) and the Centre Universitaire de Recherche et d'Applications en Télédétection of Félix Houphouet-Boigny University.

Finally, representatives of the various European and international institutions also took part of the Forum. This includes representatives from the European Commission (JRC and EU Delegation to Côte d'Ivoire), European NHMS and the World Meteorological Organization (WMO). Research institutions were also present such as the University of Reading and the University of Columbia.

The list of all participants is provided in Annex.

OVERVIEW OF THE FORUM

During the Opening Ceremony, representatives of EUMETSAT, the EU Delegation to Côte d'Ivoire, the WMO, the AUC, the AfDB, the ECCAS, the ECOWAS and the Republic of Côte d'Ivoire delivered speeches, which are included in the annex of this report. The introductory session which followed was the opportunity to present the status of two African strategies: the African Integrated Strategy on Meteorology (Weather and Climate Services) and the African Union Space Strategy. These two, together with the Joint EU-Africa Strategy, constitute the main policy framework for EUMETSAT activities in cooperation with Africa.

Plenary and working group sessions allowed participants to get information and provide feedback on EUMETSAT programmes, data access (incl. PUMA 2015 stations) and training activities. A session was specifically dedicated to the Meteosat Third Generation (MTG) and another one to Climate applications. Other sessions informed on the status of African projects funded by European Development Funds, such as SAWIDRA, the Intra-ACP Climate Services and related applications programme and GMES and Africa. Furthermore, a session introduced the use of Earth observations for marine and land applications in close connections with the GMES&Africa Support programme.

A summary of all sessions and presentations is presented in this report. All presentations and speeches delivered during the 13th EUMETSAT User Forum in Africa are included on the Forum website (https://ufa.eumetsat.int/).

SODEXAM organised a technical and cultural tour. This well-attended excursion included a visit to the CIGN and of the Ébrié Lagoon.

The full programme of the Forum is presented in Annex.

The Abidjan Declaration

A High-level event on the Meteosat Third Generation took place on 24 September morning. The event was hosted by M. Amadou Koné, Minister of Transport of the Republic of Côte d'Ivoire, with the participation of the ECOWAS Commissioner in charge of Agriculture, Environment and Water Resources, the Assistant Secretary General of ECCAS, the Senior Programme Officer of the IGAD, on behalf of its Executive Secretary, the Director of the African Union Commission's Human Resources, Sciences and Technology Department and a representative of the AMCOMET Chair person, and in presence of WMO, ACMAD, EUMETSAT and other observers. At the end of the event, the Minister of Transports and the RECs endorsed and signed the Abidjan Declaration. This Declaration was presented to and endorsed by the AMCOMET bureau on Friday 21 September 2018, and signed on that day by the AMCOMET Chair and the African Union Commissioner for Rural Economy and Agriculture.

A copy of the Declaration is presented in Annex to this report.

The Launch of the African Space Art Project (ASAP)

On Monday 24 September, the African Artists for Development Fund and EUMETSAT launched the African Space Art Project (ASAP).

ASAP aims to launch into space for the first time in the African continent history an African contemporary artwork. This worldwide artistic gesture goes with the launch into orbit of the first EUMETSAT's Meteosat Third Generation satellite, which will open a new era for meteorological observation in Africa.

During the launching ceremony, Mr. Matthias Leridon, President of African Artists for Development Fund explained the ASAP process in more details, and Mr. Alain Ratier, indicated EUMETSAT commitment to support this project. Mr. Mahama Ouédraogo of the African Union Commission welcomed the initiative, which provides an evocative and inspirational links between Arts and Technology.

MAIN OUTCOMES

The main outcomes of the Forum are captured in the recommendations listed in the next section. They are related either to EUMETSAT Programmes, to data access and training activities, to the intra-ACP for Climate services, SAWIDRA and GMES and Africa programmes, or more broadly to continental approach to foster Space and Earth observation.

The main outcomes are:

- The Forum endorsed the proposed **roadmap for the transition from MSG to MTG** in Africa and welcomed the political support provided through the Abidjan Declaration. It recommended that discussions continue:
    - with the RAIDEG to fine tune the list of priority products to be disseminated through EUMETCast Africa, and
    - with the AUC in order to ensure deployment of MTG-ready PUMA (EUMETCast reception) station by 2022-2023 timeframe;
- The Forum discussed the current status **PUMA 2015 and MESA stations**, including on the transition to the new EUMETCast Africa broadcasting satellite (EUTELSAT 8W); it recommended various actions to ensure maintenance of the station, notably through use of existing expertise at regional level and renewal of training courses for system administrators; it also suggested course of action for the upgrade of these stations in the years to come;
- The Forum provided comments on three continental project (SAWIDRA, GMES&Africa and intra-ACP for Climate services) and recommended ways **to ensure impact and appropriation of these projects at national level**;
- Finally, the Forum with the close contribution of the RAIDEG members discussed **data access and training needs** to support the exploitation of satellite data for various applications in Africa.

LIST OF RECOMMENDATIONS

Arranged as follows:

- EUMETSAT programme and RAIDEG – recommendations #1 to #5
- Climate – recommendation #6 to #7
- PUMA stations and training – recommendations #8 and #11
- GMES & Africa – recommendations #12 to #14
- SAWIDRA - recommendations #15 and #16

EUMETSAT programme

Recommendation #1 - Roadmap for MTG Africa and Abidjan Declaration

The Forum noted the roadmap for the transition from MSG to MTG presented by EUMETSAT, as well as the current list of MTG products prioritised by the RAIDEG for inclusion in the EUMETCast-Africa dataflow. The Forum recommended that the RAIDEG pursues its work with EUMETSAT regarding the prioritisation of MTG data and related products to be disseminated via EUMETCast-Africa.

The Forum welcomed the Abidjan Declaration on next generation of satellites products for weather and climate services in Africa. The Forum recommended to the Indian Ocean Commission and the SADC Secretariat to sign the Abidjan Declaration and provide their full support for its implementation.

Regarding the feasibility of the African Meteorological Satellite Application Facility (AMSAF), the Forum recommended that the Joint Working Group established by the Declaration considers potential cooperation with the EUMETSAT SAFs, while keeping the focus on African needs and skills for the development and operation of AMSAF products or software.

Recommendation #2 - New PUMA stations for MTG

The Forum noted the need to upgrade the satellite data reception infrastructure (namely the PUMA reception stations) in order to receive and visualise the MTG data. The Forum therefore very much welcomed and supported the plan presented by AUC to upgrade the PUMA stations in the 2022-2023 timeframe in the framework of intra-ACP Climate Services and related applications (ACP-CS) programme. The Forum recommended that the RAIDEG is fully involved in the drafting of the specifications of these new PUMA stations, and ensures that these specifications (on both the hardware and the software functionalities) are based on needs of the national weather forecasters. It therefore recommended RAIDEG members to fully involve representatives of national weather forecasters through surveys or other methods.

Recommendation #3 - MTG and North Africa

The Forum recommended EUMETSAT to support NMHS of North Africa to be ready for the acquisition of MTG data, products and services at the same time as the European NMHSs, by creating links between NMHSs in North Africa and the preparatory project MTGUP. In particular, the Forum recommended:

- to EUMETSAT to share information coming from MTGUP with the North African NMHSs and provide the calendar and main milestones of the MTGUP project;
- to EUMETSAT to invite representatives of NMHSs of North Africa to the "Future Generation Satellite User Workshop" taking place at the November 2019 meeting;
- to the NMHSs of Northern Africa to plan for an upgrade of their infrastructure before 2022 to receive (either via EUMETCast or via terrestrial telecommunication network, e.g. internet or dedicated local network), visualise, process, and assimilate MTG data, in particular sounder data, which are expected to be critical for their NWP model;

Recommendation #4 - RAIDEG

The Forum recognizes the crucial role of the RAIDEG on the optimization of data flows transmitted via EUMETCast, on the identification of needs in terms of (i) meteorological data (satellites or NWP models), (ii) functionalities of the tools for visualization and exploitation of the data (i.e. PUMA) and (iii) dedicated professional training.

The Forum notes, however, that RAIDEG can only fully exercise its mandate if proper communication is ensured between RAIDEG members and NMHSs as well as RCCs. The Forum therefore recommended to:

- WMO to better highlight this group on its website and to include the names and contact details of RAIDEG members;
- WMO and the President of the WMO RA-I to inform the RA-I Permanent Representatives with WMO of the existence and role of the RAIDEG, and to ask them to name one focal point who can serve as point of contact for RAIDEG in the field of satellite and NWP data requirements, and in related training;
- Permanent representatives of RA-I, as well as the RCCs, to nominate focal points for the RAIDEG as soon as possible;
- RAIDEG members to inform and contact the NMHS contact points on a regular basis.

It is however reminded that the RAIDEG does not replace the Help Desk and does not have the competence for the maintenance of the stations.

Recommendation #5 - Information on new products on EUMETCast-Africa and new data access mechanism

The Forum noted that communication about the new (group of) products that are added on EUMETCast Africa could be strengthened in order to ensure that these new products can be fully exploited. The Forum recommended therefore to

- EUMETSAT, with the support of RAIDEG, to strengthen its communication to NMHSs when new (group of) products are added on EUMETCast-Africa, by providing information on the nature of the products, their potential utilisation and the way to visualise or exploit them on the PUMA stations;
- the VLAB CoE to take into account these new products in the elaboration of their training courses;

- EUMETSAT to keep NMHSs of WMO RA-I regularly informed about the evolution of pathfinder projects on data access, as well as on web-based means to access or visualise data (e.g. CODA, EUMETView).

Climate

Recommendation #6 - RAIDEG and RCC on climate data

The Forum noted that under the new intra-ACP Climate Services and related applications Program, all RCCs have planned activities related to access to data, products and information produced by global GFCS actors (e.g. satellite data, C3S data, etc).

The Forum recommended that RCCs cooperate fully with RAIDEG members in their region in identifying regional and national needs in terms of access to climate data. The Forum also recommended that ACMAD, which is both a member of RAIDEG and an RCC, play a leading role in this cooperation for the identification of global data needs in the field of climate services.

Recommendation #7 - intra ACP Climate service

The Forum noted that the Regional Climate Centres (ACMAD, AGRHYMET, ICAPC, CAPC-AC, SADC-CSC): are currently preparing grant proposals for the intra-ACP Programme on Climate services and related applications, and have shared information about their content during the Forum. The Forum recommended:

- to all RCCs, in collaboration with WMO GFCS office, to assess and take into account in their proposals existing National Framework for Climate Services (NFCS) processes in their respective regions and to all countries that have not yet elaborated an NFCS to contact the WMO GFCS office, in collaboration with RCC, to assess efforts and pre-conditions for establishing such an NFCS;
- to ECOWAS and AGRHYMET to fully take into account the specific needs of Cabo Verde and Guinea Bissau for climate services, and to include provision in their grants to ensure that these two countries could benefit from intra-ACP programme activities planned in other Small Island Developing States in Africa, Caribbean and Pacific regions;
- to ECCAS to operationalise as quickly as possible the Central Africa Prediction Center (CAPC-AC) in order to continuously involve and inform its member states about the preparation of its regional Grant
- to ECCAS to take into account specific needs of Sao Tomé and Principe and Equatorial Guinea and to include provision in their grants to ensure that these two countries could benefit from intra-ACP programme activities planned in other Small Island Developing States in Africa, Caribbean and Pacific regions;

The Forum recommended to IOC to further inform its member countries on the status of the preparation of its grant for the intra-ACP Climate Services programme and to take fully into account the needs expressed by the SMNS and the RIC (MOI). The Forum also recommended that IOC capitalizes on this project to formalize the establishment of a Regional Climate Center for the Indian

Ocean region and suggests that, pending the establishment of this CCR-IOC, the IOC facilitate the establishment of a common climate database management system for the entire region.

PUMA stations and training

Recommendation #8 - PUMA-2015 Station

The Forum noted some weaknesses of the PUMA 2015 station compared to the PUMA 2010 station, and noted also that some requests for assistance could not be satisfied.

The Forum recommended that the African Union Commission remind States and NMHSs of their responsibilities for the maintenance of their stations as key national infrastructure in the framework of the African Union Space Policy and Strategy and the Integrated African Strategy on Meteorology.

The Forum recommended to the AUC, with the support of EUMETSAT:

- to clarify the tasks and responsibilities concerning the warranty and maintenance of the PUMA 2015 stations, as well as the Help Desk, and to communicate them to the NMHSs, RICs and CoE Vlab (EAMAC, IMTR, Morocco DMN and SAWS);
- to make sure that warranty for the equipment provided by Telespazio is exercised diligently in case of equipment failure (e.g. for UPS);
- to fully take into account the existing system administration competencies in the regions (also in institution not directly involved in G&A, as AGHRYMET, ACMAD, ASECNA and the NMHS) and to circulate the names of the African experts, per region, who have been trained as trainers for the administration of the PUMA-2015 and MESA systems;
- to give more responsibilities, in particular within the framework of the GMES & Africa and intra-ACP CS programs, to the regional organizations for the maintenance of the stations;
- to support the organization of more regular, continuous and in-depth system administration courses for NMHSs; and to include a "station maintenance and system failure diagnostic" module in VLAB CoE courses dedicated to meteorological satellite applications;
- to finalize ongoing surveys and establish a diagnosis of PUMA 2015 and MESA stations and communicate this information to the GMES & Africa project in charge of setting up a maintenance strategy for the PUMA-2015 and MESA stations.

The Forum also noted that the GMES & Africa programme has planned activities to support the maintenance of the PUMA-2015 and MESA stations, and that this maintenance activity will be mainly conducted by regional experts. The Forum recommended to AUC:

- to accelerate the effective implementation of station maintenance activities under the current GMES & Africa Support Program for the 2019-2020 timeframe and
- to provide resources in future programs to continue to support countries and regions to enable them to exercise their station maintenance responsibilities; .

The Forum finally recalls that any station failure can be reported to the EUMETSAT Help Desk (ops@eumetsat.int).

Recommendation #9 - Repointing of EUMETCast antennas

The Forum also recommended that EUMETSAT finalize, through its contractor Telespazio, the re-pointing and migration of PUMA and MESA stations to the new EUMETCast-Africa broadcast satellite. The Forum notes that some NMHSs experienced problems in early August. The Forum recommended that the NMHSs concerned inform the EUMETSAT Help Desk immediately (ops@eumetsat.int), and to EUMETSAT to support them in finalizing the migration.

Recommendation #10 - Training

The Forum recommended that the Vlab Centers of Excellence recognized by the WMO for Satellite Meteorology (IMTR, EAMAC, Morocco and SAWS) continue to conduct in-depth training on application satellite meteorology such as aeronautical and marine forecasting, climate and agro-meteorology. The Forum recommended more specifically to EAMAC and EUMETSAT to resume by 2019 the organization of courses on Basic Applications of Meteorological Satellites (EUMETSAT Satellite Application Courses), which have not been able to take place for the last two years.

The Forum recommended to VLAB Training Centre to pursue communication with the NMHSs in order to adapt their training courses to country needs.

The Forum also recommended that the VLAB Training Center cooperate closely with RCCs, particularly on training on climate applications.

Recommendation #11 - Academic sector

The Forum notes the interest of Africa's University and academic sector in exploiting EO data in their research and/or education curriculum. The Forum notes that EUMETSAT data are open access for education and research. The Forum recommended:

- to Universities to take steps for the acquisition and installation of a EUMETCast antenna and open-source software for the reception and visualization of data;
- to EUMETSAT to provide them with the necessary information for these steps;
- NMSs to continue to encourage academic work in these areas by sharing their data and needs with the academic world.

GMES & Africa and SAWIDRA

Recommendation #12: G&A and mandated national institutions

The forum noted that building capacity to exploit Earth observation in Africa for sustainable development also requires the strengthening of institutional capacity at the regional and national levels. To achieve this, it is necessary to fully involve mandated institutions in the targeted thematic areas (marine resource management, water resources management and natural resources), beyond the institutions that master EO techniques. The Forum noted that the G&A "call for proposals" process, although done in a transparent way, has not always allowed the direct involvement in the selected consortia of the national institutions mandated in the application domain. The Forum

therefore recommended that G&A consortia to make the necessary efforts to fully engage with these mandated national institutions in their area of intervention.

In particular, for marine forecast services developed by some G&A consortia, the Forum recommended that these consortia fully involve the national meteorological services of their region, which have an institutional mandate for the provision of marine forecasts, and support the capacity building of NMHSs in this area.

Recommendation #13 - G&A and NMHSs

The Forum noted the status of the GMES & Africa and the 13 selected consortia and planned services. The Forum noted that several GMES & Africa services would benefit from or are in need of hydro-meteorological information to ensure best possible services in the region. Therefore, the Forum recommended that the AUC encourage the G&A consortia to engage with the NMHS in their region in order to benefit from existing data, products and experiences, and involve the NMHSs in the G&A activities conducted at national level. The Forum recommended also to the NMHSs to visit the G&A partners in their countries in order to engage a discussion and see how cooperation could take place.

Recommendation #14 - G&A Marine

The Forum welcomed the presentation of the G&A Marine consortia and recommended to them:

- to engage in consultations between them in order to optimize complementarities (e.g. countries covered by MOI and CSIR grants), to ensure full coverage of the African coastline (e.g. coverage of Central Africa coastline) to share experiences and create synergies;
- to detail their building capacities approach and to inform the countries about training opportunities on marine applications.

The Forum also noted that WMO RA-I is planning to establish a working group on marine services, which might facilitate exchanges with GMES & Africa.

Recommendation #15 - SAWIDRA

The Forum noted the time constraints for the implementation of the SAWIDRA projects and recommended

- to the five SAWIDRA projects (one continental and four regional) to speed up the implementation of their activities, in particular the procurement of the infrastructure (RARS stations and HPCs);
- to the four SAWIDRA regional projects to engage with countries to collect needs for the equipment foreseen to be delivered at national level and training, which shall aim at improving NMHS capacity in forecasting severe weather events, and communicate warnings in an appropriate and efficient way to national authorities in charge of disaster management (e.g. civil protection);
- to the SAWIDRA project to improve communication in general, but in particular towards the NMHSs in their regions;

- to SADC-CSC to communicate with the IOC and the NMHS in the Indian ocean region about the relevance, impact and engagement of the project for these countries;
- to AfDB and ACMAD to facilitate the coordination and linkages between and among SAWIDRA projects to share experience, in particular on the “best practices” observed in some SAWIDRA regional projects, as well as to harmonize collaborative work;
- to AfDB and ACMAD to regularly inform the President of the WMO RA-I about the status of these projects, in particular their activities at national level.

Recommendation #16 - SAWIDRA sustainability

The Forum noticed the recent progress achieved by the SAWIDRA projects, but also that most of the infrastructure will be installed towards the end of the project, not allowing the projects to exploit it and start benefiting from it.

In order to sustain the results achieved, the Forum recommended AfDB, with the support of EUMETSAT and the RCC, to start preparation for a second phase of the project.

SESSIONS REPORT

INTRODUCTORY SESSION

Session purpose and Content

Following the Opening ceremony, this introductory session set the scene for the 13th EUMETSAT Forum in Africa. It included presentation of two major African strategies (on Meteorology and on Space), which provided a pan-African framework for the Forum discussion. The session included also a presentation of the Forum objective as well as a brief presentation of the status of implementation of the recommendations from the 12th Forum.

Objectives and programme of the 13th EUMETSAT User Forum in Africa
(V. Gabaglio, EUMETSAT)

Vincent presented the main objectives of the Forum, which is to reinforce the dialogue between EUMETSAT and the African user communities in order to optimise the use of satellite data and products in Africa, and to provide a platform for the users to discuss and present achievement and challenges in the access and use of satellite data. He provided a brief overview of the status of implementation of the recommendations raised during the 12th EUMETSAT User Forum in Africa. Vincent then, presented the programme of the Forum and provided logistics information.

Integrated African Strategy on Meteorology - Status and way forward
(J. Mukabana, WMO)

Joseph reminded the participants about AMCOMET, and the Integrated African Strategy on Meteorology (Weather and Climate Services). He then focused on the results achieved within this strategy since 2012, the update of the Integrated African Strategy on Meteorology, declined in five strategic pillars (Increase Political Support and Recognition of NMHSs and related WMO Regional Climate Centres, Enhance the Production and Delivery of tailored Weather and Climate Services for Sustainable Development, Improve Access to Meteorological Services in particular for the Marine and Aviation Sectors, Support the Provision of Weather and Climate Services for Climate Change Adaptation and Mitigation and Strengthen Partnerships with Relevant Institutions and Funding Mechanisms).

African Union Space Policy and Strategy
(T. Ouattara, AUC)

Tidiane introduced the Africa Space Policy and Strategy, which is the step towards an African Space Programme, under the long-term AU Agenda 2063. He stated that the two main goals are, first, to use space science and technology to derive optimal socio-economic benefits and, second, to develop and maintain indigenous infrastructure and capabilities in Africa. Then, he presented the GMES&Africa Support Programme that will contributes to deliver EO based services to African Users through 13 African Consortia focussed on Land and Marine monitoring.

SESSION 1 - OVERVIEW OF EUMETSAT PROGRAMMES

Chairperson: D. Konaté, SODEXAM
Rapporteurs: E. Barisano, EUMETSAT + F. Eklou, SODEXAM

Session purpose and Content

The first session was dedicated to the presentation of the status of the various EUMETSAT programmes and activities: MSG, EPS, Jason, MTG, EPS-SG, SAFs. It also included presentations related to training and access to EUMETSAT data (inc. EUMETCast). This session was complemented by the report of the RAIDEG activities.

Session contributions

The session consisted of six (6) presentations followed by two Q&A sessions.

Status of EUMETSAT programmes MSG, MTG, EPS, Jason and future programmes
(A. Ratier, EUMETSAT)

This presentation provided the status of the current generation of EUMETSAT geostationary and polar-orbiting satellites (MSG, METOP and Jason) and explained various applications and their impact on weather forecasting. The focus was then also on the new generation of satellite: the Meteosat Third Generation and the EUMETSAT Polar System - Second Generation (EPS-SG), explaining the status of development and the expected date of operation as of 2021 and until 2040. The role of EUMETSAT in the Copernicus program, which include the operation of Sentinels-3, -4 and -5 in support to marine, atmosphere and climate services.

EUMETSAT Data access and User services,
(S. Wannop, EUMETSAT)

This presentation showcased the various systems operated by EUMETSAT to provide access to various data and products. The primary data access is based on the EUMETCast-Africa dissemination system, which has been recently improved in terms of bandwidth, technology (from DVB to DVB-S2) and dissociated operation with respect to the EUMETCast-Europe service. Sally also presented the web & internet access services that are currently available or under development, including for the access to archived data. The presentation then focused on the new WEKEO portal, which is one of the Copernicus Data & Information Access System, jointly developed with Mercator (Copernicus marine service) and ECMWF (Copernicus Atmosphere and Climate Change services). It was then reminded that the EUMETSAT help desk service remains operational to support users, and that it can be reached through the email: ops@eumetsat.int.

EUMETSAT SAF activities
(C. Traeger, EUMETSAT)

Christine provided an overview of the activities of the EUMETSAT Satellite Application Facility (SAF). She recalled the main purpose and structure of the SAFs: networks established by national meteorological services from the EUMETSAT Member States, with participation of research institutions, in order to develop and operate specific products on several applications theme (ocean,

land, air quality, climate, etc). In order to disseminate and optimize the use of the data produced by the SAFs, practical trainings based on "concrete cases" have been set up and are proposed by EUMETSAT, including in Africa.

EUMETSAT Training activities
(V. Nietosvaara, EUMETSAT)

This presentation presented the various trainings activities and resources that are made available to users, either world-wide or more specifically in Africa. Vesa recalled the strong cooperation between EUMETSAT and the four CGMS "VLab" Centre of Excellence for training on satellite meteorology, which are located in Casablanca, Nairobi, Niamey and Pretoria. It also updated the Forum on the latest developed ASMET (African Satellite Meteorology Education and Training) courses. Finally, he provided some more insight on the training methodology, more specifically on the student selection process, which is generally based on a self-learning stage (organised through online courses), as a pre-requisite to participate in classroom training. The courses are based on case studies and simulation. The common objective of all training courses is for students to be able to apply the acquired knowledge when they return to their institutions.

Report of RAIDEG activities
(M. Diop Kane, RAIDEG Chair)

Mariane, chairwoman of the RAIDEG, recalled that the RAIDEG is composed of one NHMS per region (representing the entire region), ACMAD, VLAB CoE and invited experts. This group meets regularly (at least once per year physically, with virtual meeting happening also) and their members are in regular contact. Mariane recalled the role of the RAIDEG in advising EUMETSAT regarding access to meteorological and climatological data. She also explained the technical role played by RAIDEG in the preparation of the transition towards MTG. She presented the activities of the RAIDEG since the last Forum and commented on the recent inclusion of Copernicus data in EUMETCast and its impact on EUMETCast bandwidth. She finally concluded by highlighting the importance of the PUMA and MESA station, the need to plan for their upgrade in the coming years, and the importance in answering to continuous training needs, notably at the level of system administrators.

Copernicus and EUMETSAT contribution
(P. Counet, EUMETSAT)

Paul explained the involvement of EUMESTAT in the European Union flagship Copernicus programme. EUMETSAT has the responsibility to operate four of the six Sentinel missions: Sentinel 3 for marine and oceanographic applications, Sentinel 4 and 5 of the atmosphere, and Sentinel 6 dedicated to global sea level measurements. EUMETSAT is also fully involved in discussion related to the future Sentinel 7 mission dedicated to the monitoring of greenhouse gases.

Discussions and Recommendations

The question and answer sessions made it possible to cover the following points:

- the recognition of the crucial role of the RAIDEG group on the optimisation of EUMETSAT data flow, of operations tools and of dedicated professional training;

- the need to consolidate and strengthen these efforts, by making the relationship between the RAIDEG experts and the National Meteorological and Hydrological Services effective, in order to optimise feedback on countries' needs at the regional level;
- the need to establish close ties between the RAIDEG and the RCCs for discussions relating to data and products for the climate services;
- the need to promote involvement by the African academic sector (universities and research centres) in the development and analysis of tools to exploit data for meteorology and climate, by facilitating their access to EUMETSAT data (EUMETCast) and existing tools (PUMA Station and e-station/JRC);
- the request to improve the maintenance for the PUMA 2015 (and MESA) stations, based on the results of the survey carried out by EUMETSAT on the statuses of the PUMA 2015 stations, in particular by communicating this information to the GMES and Africa Project, which is in charge of organising PUMA station maintenance, with a heightened role by the regional centres.

The Session 1 contributed to recommendations #1, #3, #4, #8 and #10.

SESSION 2 - METEOSAT THIRD GENERATION

Chairperson: J. Mukabana, WMO
Rapporteurs: P. Counet, EUMETSAT + J. Kagenyi, IMTR

Session purpose and Content

The Second Session was dedicated to the Meteosat Third Generation (MTG) programme and its benefit for Africa. It allowed the participant to discuss priorities in terms of MTG data sets to be made available in near real time to Africa, as wells as transition from MSG to MTG. During the session A. Ratier, EUMETSAT Director General, gave an introductory remark followed by three presentations focusing on MTG products and status, MSG transition to MTG, the calendars and the data to be disseminated, as prioritised by RAIDEG taking into account the available bandwidth of 3.5 MBs/s. The Session also discussed the current plans for upgrading the PUMA-2015 stations in order to receive and visualise the prioritised MTG data.

Session contributions

Introductory remarks
(A. Ratier, EUMETSAT)

Alain Ratier, Director-General of EUMETSAT, introduced the session by recalling that at the last Forum there was a recommendation to initiate a study with RAIDEG to discuss the transition towards MTG. The study showed that there is some time as MTG data will be available for Africa after the end of 2022, one year after the launch of the first satellite and the commissioning phase of one year. Under the current plan, the MSG satellites will continue to be operated at 0 degree in parallel with MTG at least until end of 2024. Hence the need to define the best possible transition, that will need to take place between end of 2022 and beginning of 2025.

MTG Products dissemination and Status
(D. Fayard and V. Gabaglio, EUMETSAT)

D. Fayard and V. Gabaglio, EUMETSAT, highlighted in their presentation the main products of MTG with emphasis on the new Lightening product. Denis also presented the current Status of MTG spacecraft, which is being manufactured. A comparison between MSG and MTG in terms of spectral, spatial, and temporal resolution was presented. He also explained that the MTG ground segment is being put in place to be ready before the launch of the first MTG satellite, planned for the third quarter (Q3) of 2021.

The presentation then explained the challenges for the introduction of MTG data in Africa, as the volume of expected data is about 25 times bigger than the current volume of MSG data. This means that more capacities in term of data dissemination, reception, processing and applications will be needed. This implies also the need to upgrade the PUMA-2015, possibly through the Intra ACP-Climate Program, to ensure that the MTG data can be received, processed and visualized operationally in the NMHS and without interruption with respect to MSG data.

RAIDEG contribution to MTG Africa
(M. Diop Kane, Chair of RAIDEG)

Mariane Diop Kane explained the process adopted by RAIDEG to set priorities for the transition to MTG. She indicated that the RAIDEG looked at various needs related to various meteorological applications sectors (aviation, marine, agriculture, climate, etc.) and discussed the most appropriate set of MTG Data and products to satisfy these needs, while weighting also the need to ensure continuity with respect to the current situation. She explained that the RAIDEG discussed at length the best balance between temporal, spatial and spectral resolutions in order to find an optimal set of MTG data & products that could be disseminated operationally to all NMHS. The calendar for the transition to new MTG data was then discussed for their inclusion in the MSG to MTG transition roadmap.

PUMA-2015 Upgrade towards MTG
(V. Gabaglio, EUMETSAT)

Vincent explained that the current PUMA-2015 stations, installed in 2016/2017 would need to be upgraded in 2022, as the expected life-time of such equipment is about 6 years. After this time frame, it is very likely that maintenance would cost more than refurbishing equipment. With the arrival of MTG in 2023, it is also important to anticipate the need to have software within the PUMA station, which can continue the reception and visualisation of MSG data, but that has also the initial capabilities for the MTG data sets. He reported the needs expressed by the users to have the current PUMA-2015 and MESA stations maintained until 2022, mentioning that the MESA project put in place some expertise at regional level for the maintenance of the stations (RICs, RCCs, ASCENA, and some private individuals) that could be used to support the maintenance and training activities for the period 2019-2022. He reported that discussions are on-going on this with the GMES and Africa but reminded the responsibility of the NMHS to maintain their system.

EUMETSAT and RAIDEG also reminded that new meteorological products will be added in 2019 to EUMETCast (such as Rapidly Developing Thunderstorms (RDT) and the 4-km model products from UK-Tropical models) based on RAIDEG-9 meeting, which will need an update of the current PUMA-2015 software.

Considering the period beyond 2022, it is necessary to anticipate a refurbishment of the PUMA-2015 station with a new software that will be able to receive, process and visualise the MTG data. He mentioned that discussion are on-going to have this operational considered under the Intra-ACP Climate Services Program, and that RAIDEG will be fully involved in the preparation of the specification for the PUMA station hardware and the new software that shall be based on African user needs.

Discussions and Recommendations

Following the presentation, the following points were raised.

- RAIDEG confirmed that the access to Numerical Weather Models products was also taken into account during RAIDEG meetings. As a result several NWP model outputs are disseminated through EUMETCast Africa.
- The Forum highlighted the need for NMHSs to designate focal points to support the RAIDEG member from their region. WMO sent letters to WMO PR in the past, but these letters were not always responded to and RAIDEG regional member don't know who to contact.
- Further clarifications were provided on the Lightening Imager which will observe both Cloud to Ground and Cloud to Cloud lightening. Regarding the IRS instrument on board the MTG-Sounder satellite, it was indicated that the instrument will measure Africa less often than Europe, and that this was not considered yet in the priority discussion with RAIDEG.
- The Forum indicated the importance of a close cooperation between the RCCs and RAIDEG during discussion related to access to global climate data and products, which might result in putting more climate-related products in EUMETCast, in support to Climate services. The RCCs will play a key role within the Intra-ACP Climate Services and related applications programme, where they will assess needs for additional global climate data & products. RCCs shall ensure that their analysis and request are brought to the attention of RAIDEG, i.e. through ACMAD.
- Some participants raised question regarding the scope of the African Meteorological Satellite Application Facility (AMSAF), which has been promoted through the Abidjan Declaration. It was underlined that the Declaration is the start of a process, which will assess the feasibility of the AMSAF and its potential scope. There is indeed a need to formulate the scope of an African Meteorological SAF, how it should build on existing services (e.g. resulting from AMESD and MESA projects), how it will be structured and funded, as well as the role of the various stakeholders and the possible connection with the EUMETSAT SAFs. The Abidjan Declaration includes the creation of a Task Team to start looking at these aspects.

Session 2 contributed to recommendations #1 to #3, #4.

SESSION 3 - CLIMATE MONITORING AND SERVICES

Chairperson: B. K. Djeri- Alassani, ECOWAS
Rapporteurs: V. Nietosvaara, EUMETSAT; L. Razafindrakoto, ACMAD and H. Trebossen, EUMETSAT

Session purpose and Content

This session was dedicated to climate services and applications within the African continent to support climate monitoring activities. This session included eleven presentations (six during the morning session, five during the afternoon session) combining institutional and scientific elements, related to the establishment of Climate Services in and for Africa and working group discussions on implementation of the intra-ACP Climate services per region.

Session contributions

African Climate Change policy and intra-ACP Programme on Climate Service and related applications (L. Naess, AUC)

Leah introduced the Draft African Climate Strategy which vision is to provide to AU, RECs, member states, other stakeholders strategic guidance to address climate change challenges. The thematic pillars are governance, promoting research, education, awareness and advocacy, mainstreaming and integrating climate change imperatives in planning, budgeting, and development processes and promoting national, regional and international cooperation. Status of the Strategy is under review as well as the validation process. Then Leah presented the intra-ACP Programme on Climate Service and related applications funded by the 11th EDF and covering 48 African countries of ECCAS, ECOWAS, IGAD, IOC and SADC regions. The AUC role will be to provide overall guidance and coordination for Africa. This project will contribute, among others, to upgrade PUMA stations.

GFCS status and WMO contribution to intra-ACP Climate Service and related programme (F. Lucio, WMO)

F. Lucio from WMO introduced the vision and status of WMO Global Framework for Climate Services (GFCS) programme. He stated that we need a global, regional and a local network climate services especially for Africa as the climate hazards and their intensity are increasing. The pillars of GFCS are: User Interface Platform, Climate Monitoring, Research Modelling and Prediction and Capacity Development. Seamless hydro-meteorological and climate services are able to combine the weather, climate variability and climate change scenarios. The climate services need to be available, dependable, usable, credible, authentic, responsive, flexible and sustainable. He also presented the status of the establishment of National Framework of Climate Services and the major needs and pre-requisites identified during this exercise. Then he detailed the contribution of WMO contribution to intra-ACP CS programme through notably results 1 to 4.

Architecture for space-based climate observation
(P. Counet, EUMETSAT)

Paul presented the role and objectives of the joint CEOS/CGMS Working Group on Climate which is the focal point of space agencies to address GCOS requirements and which is the single coordinated voice towards UNFCCC. The Essential Climate Variables (ECVs) inventory provides a resource for the whole community that wants to use and create climate data records. The Climate WG has the tools for effective analysis of the data and plan of the space agencies, to optimise utilisation of existing measurements and planning of new measurements for climate monitoring.

Copernicus Climate Change Service
(J.-N. Thépaut, C3S)

Jean-Noel presented first the mission of the C3S, and then detailed the C3S services and products portfolio which aim to ensure access to the past, present and future climate data. The C3S portfolio includes: consistent estimates of multiple Essential Climate Variables, Global and regional reanalyses (covering a comprehensive Earth system domain: atmosphere, ocean, land and carbon), products based on observations alone (gridded; homogenised station series; reprocessed Climate Data Records), a near-real-time climate monitoring facility, multi-model seasonal forecasts and climate projections at global and regional scales. Then, Jean Noel described the Copernicus Climate Change Service Sectoral Information Systems which will provide sector-specific shop windows for the C3S Climate Data Store. He closed his presentation with details on the C3S partnership with International institutions which includes, among others: European Union, GFCS and NFCS in Europe, GCOS, GEO, UNFCCC and NOAA.

Satellite data in support to Climate Service
(S. Kothe, CM-SAF)

Steffen introduced CM-SAF which aims to use the Earth Observation (EO) data to deliver climate monitoring from space through the furniture of EO datasets with a specific focus on Global energy and water cycle. The CLAAS-2, CLARA-A2, HOAPS, SARAH-2 datasets, the Essential Climate Variables (ECV) inventory and their access were presented. Steffen gave some examples of the applications using these datasets, for example sunshine duration, sunny days and Microphysical cloud properties. Another example was about Solar Atlas in South Africa, which was established for solar energy and agricultural yield purposes. One more example was on Agricultural application in Ethiopia. In conclusion, Steffen told about how to access and manipulate the CM-SAF data, and how they arrange training workshops for climatologists.

Enhancing National Climate Services initiative (ENACTS)
(T. Dinku, IRI)

Dr Dinku presented IRI's "Enhancing National Climate Services (ENACTS)" programme, which is a multi-faceted initiative designed to bring climate data (including 35 years of climate data time series) and knowledge into local decision-making through 03 pillars: improved data accessibility, enhance access (online tools for data analysis and visualization) and user interface to promote and engage users in

the use of ENACTS data and products. GFCS and NFCS programmes benefit from ENACTS initiative, in this regards, Dr Dinku presented the example of the use of ENACTS products in agriculture in Rwanda.

Long-term rainfall monitoring and agricultural early warning across Africa
(R. Maidment, University of Reading)

Ross presented an overview of TAMSAT rainfall products and other areas of development within the group and the wider Earth Observation Division in University of Reading. He recalled that operational and locally calibrated, Meteosat-derived rainfall estimates have been generated by the "Tropical Applications of Meteorology using SATellite and ground-based observations "(TAMSAT) group at the University of Reading (UK) since the 1980s. The data have been used in many applications, in particular drought monitoring and famine early warning and are still used by many organisations across different sectors. TAMSAT is continually developing the rainfall estimates it produces, by closely working with various organisations, to provide valuable and timely user-relevant information. The TAMSAT Version 3.0 is operational since Jan 2017 and provides as primary products pentadadal rainfall estimates at 04 km resolution.

ESA EO4SD Climate Cluster - Earth Observation in support of Climate Resilience
(C. Domenech, GMV)

The presenter highlighted that resilience to climate change and variability has emerged as a key concept for policy and programme development. EO data is crucial for climate resilience decision-making, because it offers manifold possibilities for monitoring the environmental changes and complement the existing data. The EO4SD programme intends to provide answers about the real potential of EO in supporting climate resilience decision-making with IFIs and their client states. The services are developed in partnership with stakeholders in order to achieve a comprehensive overview. The system is based on space-based EO data, other climate data as well as on climate projections. The objectives of the programme are EO-based integrated platform, stakeholder engagement and capacity building. The project focuses on many impacts of the climate change. The EO-based climate information platform will also integrate user-driven reports. In Africa the preliminary countries and regions of interest include eastern Africa.

WASCAL activities based on Earth observation
(G. Forkuor, WASCAL)

The presentation gives an overview of the past, present and envisaged activities of the Earth Observation applications unit of WASCAL. It presents the spatial scales, themes, remote sensing data and applications that are used. Examples of WASCAL's Climate and Environmental Services (CES), products and capacity building activities in EO data usage were presented. The current state of the EUMETCast antenna installed at WASCAL's office in Ouagadougou is given, while the envisaged use of the data for providing climate and environmental services is elucidated.

Use of CM SAF data, example in Cote d'Ivoire
(D. Konaté, SODEXAM / MIRAH / CRO/MINADER)

Daouda presented the role of Earth Observation and its importance for early warning in Cote d'Ivoire. The challenges are the poor and limited coverage of the in-situ observation network, the limited access to NWP data and products, and tracking of the convective cells. The impacts of satellite observation data have significantly improved their monitoring weather watch and prediction. The presenter showed examples from various fields of application: agriculture, fire detection and flood monitoring to demonstrate the capabilities of EO.

Role of ACMAD in the implementation of Climate Service in Africa
(B. Lamptey, ACMAD)

Benjamin briefly presented ACMAD's history and recalled that ACMAD became operational in 1992. A WMO/RCC has been established at ACMAD the last few years to provide continental climate products in support of regional and national climate activities. There are two modes of implementation: fully self-contained or distributed mode. ACMAD is post-processing climate information from GPCs for application over the continent. Some of ACMADs RCC functions are climate monitoring, Long Range forecasting, Data services, training research and development. A success story of the MESA - AUC project was presented.

Discussions and Recommendations

After the presentations there were a number of points that were discussed in plenary including:

- The role of WMO in support to the Green Climate Fund (GCF): the GCF requested WMO to provide technical advices. Therefore WMO would not implement directly GCF funded project but would support GCF in identifying implementing entities for projects that have been already submitted to GCF by WMO.
- The AUC within its Climate Change Policy would enhance the role of African Scientists in assessing the scale of Climate Change impacts in Africa.
- The version 3 of the TAMSAT products will be available through EUMETCAST in a few months and will improve the monitoring of warm low cloud precipitation.
- The role of MSG products in the precipitation forecasting in support to the Flood Early Warning System set up in Côte d'Ivoire.

Outcomes of group discussions:

After the plenary session, Group discussions were organized per region to discuss about the Intra-ACP Climate Services and related applications programme. More specifically, for each region (i.e.: ECCAS/CEMAC, ECOWAS, IGAD, IOC and SADC), the objectives of the WGs were to inform countries about the on-going grant preparation and to collect feedback from country representatives. For the North Africa, the discussion focussed on MTG transition. The following points have been raised:

Group #1 - Central Africa (ECCAS/CEMAC - CAPC-AC)

- Operationalise the Central Africa Prediction Center (CAPC-AC) in order to involve and inform their member states about the preparation of its Intra-ACP CS regional Grant
- Take into account specific needs to Sao Tomé and Principe and Equatorial Guinea and to include provision in their grants to ensure that these two countries could benefit from intra-ACP programme activities planned in others Small Island Developing States in Africa, Caribbean and Pacific regions;

Group #2 - Western Africa (AGRHYMET / ECOWAS)

- Take into account the specific needs of Cabo Verde and Guinea Bissau for climate services, and to include provision in their grants to ensure that these two countries could benefit from intra-ACP programme activities planned in others Small Island Developing States in Africa, Caribbean and Pacific regions;
- Strengthen the capacity component notably in maintenance of ground climate stations

Group #3 - Southern Africa (SADC-CSC)

- Involve member states and other national and regional key players who could contribute to the implementation (SANSA, SAWS, SASSCAL etc.) in the development and in the implementation of the proposal;
- Include component of Training of users/system administrators for MESA/PUMA stations;
- Ensure linkage from long range to short range forecasting, to ensure that there is a smooth flow and agreement;

Group #4 - Eastern Africa (IGAD/ICPAC)

- Strengthen building capacity gap need assessment will be carried out by contacting NMHSs;
- Better involve NMHSs in drafting the project proposal;
- Consider to reinforce the NMHSs capacity in communication of climate information for decision makers and the general public.

Group #5 - Indian Ocean (IOC)

- IOC to inform its member countries on the status of the preparation of its grant for the intra-ACP Climate Services programme
- Take fully into account the needs expressed by the NMHSs and the RIC (MOI).
- Formalize the establishment of a Regional Climate Center for the Indian Ocean region,
- Ask IOC to facilitate the establishment of a common climate database management system for the entire region.

Group #6 - North Africa (MTG North Africa)

The Northern coast of the southern Mediterranean countries will benefit from additional services from MTG: the Rapid Scan Service and the Sounder of the MTG-S satellite.

- Share information coming from MTG-UP to the North Africa NMHS and provide calendar and main milestone of MTG-UP project
- Invite representative of NMHS of North Africa to the November 2019 meeting about MTG in Darmstadt.
- Plan for an upgrade of NHMSs's infrastructure before 2022 to receive (either via EUMETCast or via terrestrial telecommunication network, e.g. internet or dedicated local network), visualise, process, and assimilate MTG data, in particular sounder data, which are expected to be critical for their NWP model.

The Session 3 contributed to recommendations #3 and #7.

SESSION 4 - TRAINING, STATIONS AND DATA ACCESS

Chairperson: M. Diop Kane, RAIDEG Chairperson
Rapporteurs: C. Traeger, EUMETSAT + W. Balogh, WMO

Session purpose and Content

The fourth Session was dedicated to the discussion on training requirements, the use of EUMETCast/PUMA stations and the requirements for data. The session consisted of two presentations addressing EUMETCAST PUMA stations and one presentation from the CIGN (Centre d'Information Géographique et du Numérique (CIGN) from the Bureau National d'Etudes Techniques et de Développement (BNETD)) in view of the technical visit. The session was followed by group discussions on data access and training.

Session contributions

Use of EUMETCast station for agro- meteorological applications
(S. Traoré, AGRHYMET)

Seydou Traore presented the role of AGRHYMET which provides agrometeorological applications and services, such as rainfall monitoring, vegetation maps for pest control and livestock carrying capacity for the entire ECOWAS region. His presentation focused on the use by AGRHYMET of the PUMA and MESA stations in support to these services. In addition, Seydou also presented the current activities undertaken by AGRHYMET to improve awareness about the availability of its products.

Effective Use of PUMA station for nowcasting applications
(J. Kagenyi, IMTR)

This presentation explained how to make use of the PUMA WorkStation and of the Synergie software package to create forecasts, using a step-wise approach. The Synergie system was designed by meteorologists of MeteoFrance, dedicated specifically to the needs of weather forecasters. Synergie includes all data necessary for weather forecasting: NWP, satellite data and products, wave models, synoptic observations, radar observations, etc. Synergie is designed to integrate all data needed by forecasters and includes tools (analysis, diagnosis, prognosis) to provide weather forecast for various

applications (e.g. aviation, civil protection, etc.). The presentation included a description of the forecasting process used by Synergie.

Presentation of CIGN activities
(C. N'Doume, CIGN/BNEDT/ CNTIG/ASECNA)

The Centre d'Information Géographique et du Numérique (CIGN) du Bureau National d'Etudes Techniques et de Développement (BNETD) is responsible for the production of cartographic information in the Côte d'Ivoire. Participants visited CIGN/BNETD during the technical visit in the afternoon. In 2013 CIGN conducted a survey of the country's forest area to assess deforestation, using satellite images. A comparison with a 1969 map showed that the forest area had decreased from 10 million hectares to 3 million hectares, while the area of farms doubled during this period. CIGN also participates in the FAO/REDD+ process, which aims at determining the direct causes of deforestation, which was conducted in 2016. A new survey is being prepared through the national REDD+ programme and will make use of Copernicus Sentinel data.

Following the presentations in plenary two splinter groups discussed issues of data access and training. A third group met to discuss the follow-on of the Abidjan declaration.

Working Group 1. French-speaking NMHS

The Group 1 (French-speaking participants) on data access (station) and training gathered 44 participants mainly from NHMSs. The participants, during the group discussion, highlighted the various issues faced in using and maintaining PUMA Stations, their wishes in terms of new data for weather forecast, improvements and ideas of new training sessions. From the discussions the following points emerged:

- Training on PUMA and MESA station maintenance. WG1 participants suggest to include training module related to "system administration and maintenance" as part of the training sessions dedicated to data users.
- PUMA design: The WG1 highlighted the need to strengthen the involvement of data users notably the weather forecaster in the design (HW and SW) of the next generation of PUMA stations.
- Status of PUMA-2015 stations: The WG1 outlined some problems faced by NMHSs on the use and maintenance of PUMA 2015 stations before and after the move from EUTELSAT 5W to 8W and compared to the PUMA 2010 stations. An approach for the maintenance of existing PUMA station will be drafted in close cooperation with GMES&Africa, based on, among other elements, the outcome of the EUMETSAT survey on the status of the PUMA 2015 stations.
- WG1 participants outlined the need for EAMAC to better communicate with NMHS in order to adapt EAMAC training activities related to PUMA stations based on country's needs.

Working Group 2. English-speaking NMHS

The purpose of this working group was to address problems with the EUMETCast stations, to discuss on how and to whom to log complaints (e.g. hardware/software/data issues). Among the problems encountered by the countries:

- Antenna repointing has caused some issues in addition to those that had been present since the set-up of the station.
- There is in some countries confusion on who to contact and where to get help from.
- Discussions on how to access archived EUMETSAT data:
    - Archived data is free.
    - It can be ordered on disc or downloaded online.
    - Those making a request should carefully think about what they need to ensure that the order/request will be reasonable in size.
    - If not certain or assistance is required, please contact the helpdesk.
- Tour-de-table by the facilitator, asking whose station is not working:
    - Uganda (no signal, already contacted the helpdesk)
    - Zimbabwe (sent screenshot to helpdesk, they are currently working on it)
    - Sierra Leone (issue with their antenna, Telespazio has been contacted)
    - Cap Verde (requires new LNB)
    - Sudan, South Sudan, Angola and Liberia indicated also issue but could not describe it.
    - Egypt (cannot receive MeteoSat-11->seems to be a Software problem, they are not using a PUMA station though).

Working Group 3. Abidjan declaration follow-on

The scope of this meeting organised was to discuss the setting up of the joint Working Group to monitor and facilitate the implementation of the Abidjan Declaration. During the meeting, the following way forward was agreed:

- the African Union Commission will share initial Draft action plan and Draft Terms of Reference for the Joint Working Group (JWG), with the technical support of EUMETSAT;
- a first meeting of the Joint Working Group shall be planned prior to the 4th Session of the AMCOMET (February 2019), if possible still in 2018;

The meeting also proposed that the draft ToR of the JWG should include:

- define main actions to support the transition towards MTG (taking into account the technical work done by the RAIDEG in cooperation with EUMETSAT);
- draft initial concept note on the African Meteorological Satellite Application Facility (AMSAF) and plan for its implementation (taking into account the outcomes of the AMCOMET Task Force on the African Space Programme);
- refine the Draft Action Plan;
- define and support fund mobilisation for:
    - the implementation of transition to MTG and ramp-up after transition;
    - the feasibility study for the AMSAF;
    - the implementation of the AMSAF.

Then, the participants shared some ideas about MTG Transition and AMSAF:

Regarding the transition to MTG:

- the RAIDEG and EUMETSAT have been working over the past 3 years to define a Roadmap for the transition to MTG, which was presented during the Session #2 of the 13th EUMETSAT User Forum in Africa and the Forum recommended to RAIDEG and EUMETSAT to pursue this cooperation, notably on the prioritisation of the MTG data and products to be considered for the transition;
- this technical work will serve as input to the JWG, which will concentrate on more strategic issues regarding the transition (e.g. fund mobilisation), as well as on the post-transition ramp-up to allow full exploitation of MTG in Africa;

Regarding the AMSAF:

- the meeting showed willingness to learn more about the EUMETSAT SAF concept, which is based on:
    - the willingness of several countries to join forces (economy of scale) to commonly develop, based on meteorological satellites data, added-value thematic products or algorithm that can be used operationally by the NMHS in support to their mandate related to weather forecasting, public warning, marine forecast, hydrology, aviation, climate, air pollution, etc.
    - the collaborative approach in a network on specific themes/applications, mixing National Meteorological Services and Research Institutions, in order to combine expertise related to (i) EO R&D and innovation, (ii) exploitation of operational systems and (iii) actual forecasters/users' needs.

EUMESAT agreed to make available more information on the genesis, implementation and operation of its SAF, as a source of inspiration, but not necessarily for duplicating. A first meeting of the JWG could be done in association with one of the EUMETSAT SAF (e.g. LSA SAF).

- the meeting highlighted the need to associate closely NMHS to academic partners active in the area of atmospheric, marine, hydrology and climate sciences, as well as EO (remote sensing) specialist;
- the meeting underlined that AMSAF should focus on the needs expressed by African stakeholders/users, and make full use of existing African capacities available in existing African institutions, while looking at possibility to partner and cooperate with European entities specialized in these matters.

Session 4 contributed to recommendations #1, #3, #4, and #10

SESSION 5 - MARINE APPLICATIONS

Chairperson: T. Ouattara, AUC
Rapporteurs: S. Wannop, EUMETSAT + D. Kirugara, GMES&Africa

Session purpose and Content

The fifth Session was dedicated to Marine Applications. During the session, an overview of the capabilities of Sentinel-3 in delivery of products was highlighted following training opportunities provided by EUMETSAT, with specific reference to G&A Marine Consortia delivered by Christine Trager. Later, the presentation of the planned actions of all the four G&A Marine and Coastal Resource projects were delivered by Dogbeda Yao Azumah, Graeme McFerren, Omar Elbadawy and Oomarsing Gooroochurn for the G&A implementation for Western Africa, Southern Africa, Northern Africa, Indian Ocean and Eastern Africa respectively. This was followed by the delivery of a presentation by Lee-Ann Simpson from SAWS on the utilization of satellite data for Marine Meteorology. The session was concluded by an open discussion on G&A stations modulated by the Chair, Dr Tidiane Ouattara.

Session contributions

Sentinel – 3 Marine Products
(Ch. Traeger, EUMETSAT)

Christine Traeger, while making her presentation on behalf of Mark Higgins gave an overview on Sentinel-3 family of satellites operated by EUMETSAT, recalling that Sentinel-3A has been on orbit since February 2016 and Sentinel-3B was launched in April 2018. She reminded the audience that both satellites are currently in the tandem phase and EUMETSAT provides Sentinel-3 level-1 products and also level-2 products over ocean and large water bodies. Level-2 products over land are provided by ESA.

She briefly mentioned the instruments on-board the satellites, the SRAL – Altimetry Instrument, the SLSTR – Sea and Land Surface Temperatures Radiometer and finally the OLCI – Ocean and Land Colour Instrument. Finally, she demonstrated to the audience some different examples of applications derived from use of Sentinel 3, e.g. studying physical ocean dynamics, sea level measurement, detecting Harmful Algal Blooms and pointed the audience to the EUMETSAT training study library for more information (*https://www.eumetsat.int/website/home/Data/Training/TrainingLibrary/index.html*)

EUMETSAT training on Marine applications
(C. Traeger, EUMETSAT)

This presentation was also provided by Christine Traeger and highlighted the training opportunities offered by EUMETSAT in marine meteorology and ocean applications. She informed the audience that such regular training typically follows a blended approach combining online and classroom that is offered at the Marine Meteorology Training Centres in South African and Morocco to both English and French-speaking audiences.

She reminded the participants that EUMETSAT has in the past offered an Ocean Applications Training in Africa with collaboration with the University of Ghana and that in November 2018, EUMETSAT will

organize a Marine Expert Exchange Workshop with G&A Marine Consortia to exchange knowledge and experience, with the objective of harmonizing training activities on ocean applications to specific African needs. She also highlighted that the African User Community can benefit from EUMETSAT with specific training needs to certain tools (e.g. python, DIAS) and that opportunities exist from EUMETSAT for travel and accommodation support to young inexperienced Africans with interest to build operational services using Copernicus Africa training within the Collaborative Expert training programme.

She finalized her presentation by encouraging marine users to get in touch via email *Copernicus.training@eumetsat.int* or via the Copernicus Marine User Forum: *https://forums.eumetsat.int/forums/forum/copernicus-marine-calval/*

G&A implementation in Western Africa
(D. Y. Azumah, University of Ghana)

This presentation was delivered by Dogbeda Yao Azumah from the University of Ghana (UoG), the leader of the G&A Western Africa Marine and Coastal resources consortium. He informed that participants together with other seven other partners, the project will seek to provide information to decision-makers to support effective marine and coastal resources management in Western Africa. He emphasized that the project will build on the successes of the previous MESA project and that the five proposed operational Earth Observation services will be developed to support West Africa's blue growth to 12 ECOWAS coastal countries.

Finally, he demonstrated potential fishing zone charts overlaid with vessel traffic that has been used to provide information to fisheries decision makers resulting in the introduction of fishing closed seasons. He also informed the participants of the forecast of ocean conditions service that is disseminated as SMS alerts to the fishing community in collaboration with the Ghana Meteorological Agency.

G&A implementation in Southern Africa
(G. McFerren, CSIR)

This presentation was delivered by Graeme McFerren from the Council of Scientific and Industrial Research (CSIR) of South Africa, the leader of the G&A Southern Africa Marine and Coastal resources consortium. He explained that the services to be provided within the G&A project will largely be based on their experiences with the National Oceans and Coastal Information Management Systems (OCIMS) Project that will be upscaled regionally, to seven other partners derived from Benguela Current LME and the Agulhas Somali Current LME. The OCIMS service development has a strong bottom up approach in terms of users' needs in Sea State Monitoring & Maritime Operations Support, Fisheries operational support and compliance monitoring, Water Quality and Harmful Algal Bloom Monitoring. Finally, he expressed that CSIR is interested in the EUMETSAT Pathfinder projects and would like to explore EUMETCast Terrestrial access (currently under investigation).

G&A implementation in Northern Africa
(O. Elbadawy, CEDARE)

The presentation was delivered by Omar Elbadawy from the Centre for Environment and Development for the Arab Region and Europe (CEDARE) on behalf of Prof. Islam Abou El-Magd from the National Authority for Remote Sensing and Space Sciences (NARSS), the leader of the G&A Northern Africa Marine and Coastal resources consortium. Besides NARSS and CEDARE, Omar told the participants that the consortium consists of three more partners and together they will develop and deliver coastal vulnerability indices to sea level rise, natural hazards, pollution and environmental hazards to different specific category of target groups (e.g. NGOs, fishing and environmental agencies etc) along the North African coastline.

G&A implementation in Indian Ocean and Eastern Africa
(O. Gooroochurn, MOI)

The presentation was delivered by Oomarsing Gooroochurn from the Mauritius Oceanography Institute (MOI), the leader of the G&A Indian and Ocean Eastern Africa Marine and Coastal resources consortium. He reminded the audience that MOI was involved in predecessor programmes AMESD and MESA. He informed the audience that during G&A MOI will use Sentinel data to provide information of potential fishing zone locations, coastal mapping, and vulnerability. The project will also provide 3-day Marine Forecast based on Mercator Ocean products.

Use of satellite data for marine meteorology
(L.-A. Simpson, SAWS)

The presentation was delivered by Lee-Ann Simpson from South African Weather Services (SAWS). She informed the participants that SAWS is involved in training aspects for marine meteorology and then demonstrated some examples using multi altimetry sensors and scatterometers within World Meteorological Organization (WMO) training framework. She informed the audience that marine meteorologists are using satellite data (altimeter data from Sentinel 3 A and Jason) and scatterometer data from Metop-A & MetopB (ASCAT) for applications in weather system identification and placement, sea state measurement (mostly wind driven), anticipation/observation of marine weather-related hazards and assimilation into prediction models.

Discussions and Recommendations

Regarding the G&A implementation in Western Africa, participants from DRC, Togo and Cote d'Ivoire expressed interest in providing skills in Marine Forecasting available at their NMHS. They were advised to hold bilateral with the lead consortia.

Regarding the G&A implementation in Southern Africa, SAWS needed to know the proposed marine forecasting extent foreseen within consortium, whether only coastal or also deep sea. The response was that CSIR marine forecasting is primarily used for search and rescue operation within the 14 nautical miles coastal areas, yet they are willing to cooperate with SAWS to extend coverage to deep sea as well.

Regarding the G&A implementation in Northern Africa, there was a suggestion encouraging the Leader of the Consortia to engage bilaterally with other institutions within the Northern Africa region possessing thematic and/or technological capacities / capabilities as associates.

Regarding the G&A implementation in Indian Ocean and Eastern Africa, the participants were informed that Comoros is not a partner of the project but will be a beneficiary of the information derived from the project.

Then, an open discussion on Stations was modulated by the Chair, Dr Tidiane Ouattara.
He informed the audience that 20 new stations will be procured for the G&A consortia and partners. It was realized that all PUMA 2015 have a marine meteorology module for marine weather and only one MESA station of UoG is configured for Marine meteorology.

On the maintenance of stations and sustainability, it was agreed that there needs to be a system to know who is responsible for stations and documentation for accountability, and then collectively working together and mobilizing resources for maintenance of stations installed during AMESD and MESA.

Session 5 contributed to recommendation #8, #12 to #14

SESSION 6 - DISASTER RISK REDUCTION

Chairperson: A. Diane, AUC
Rapporteurs: H. Trebossen, EUMETSAT + D. Goudou, AfDB

Session purpose and Content

Tis session was dedicated to Disaster Risk Reduction applications. This session included ten presentations combining institutional and scientific and technical elements, related to the SAWIDRA project and other International and African regional and national experiences.

Session contributions

International Charter: Space and Major Disaster
(S. Wannop, EUMETSAT)

The Charter is a worldwide collaboration, through which satellite data are made available for the benefit of disaster management. By combining Earth observation assets from different space agencies, the Charter allows resources and expertise to be coordinated for rapid response to major disaster situations; thereby helping civil protection authorities and the international humanitarian community. This unique initiative is able to mobilise agencies around the world and benefit from their know-how and their satellites through a single access point that operates 24 hours a day, 7 days a week and at no cost to the user. The Charter encourages national disaster management agencies on the African continent to take advantage of Universal Access and to become an Authorized User. To become an Authorized User, the entity or its delegated agency, should have a national mandate to coordinate

emergency response measures in the respective country. A simple registration and training process is all that is required.

Satellite and Weather Information for Disaster Resilience in Africa (SAWIDRA)

Overview of SAWIDRA projects
(J. Kabyemera, AfDB)

Mr Kabyemera presented an overview of the five SAWIDRA projects (one continental and four regional). He informed the Forum that these projects were funded by the AfDB's ClimDev Special Fund, thanks to contribution by the European Union Development Fund through the intra-ACP Disaster resilience in Africa programme. Justus highlighted that all programme are now started and that the Bank has already made a mid-term assessment of three of the five projects.

SAWIDRA Continental (RARS Africa and NWP)
(B. Lamptey, ACMAD)

The continental component of the SAWIDRA project will assimilate polar orbiting satellite data from the four Regional Advanced Retransmission Systems (RARS) to be installed on the continent, as well as in situ data into the Weather Research and Forecasting (WRF) model to be run at a relatively coarse horizontal resolution (of the order of 6 km) and generate initial conditions for the regional centres to run their WRF model at higher resolution (of the order of 2km) over their respective regions.

Additionally, ACMAD will generate products for AU (e.g. AWGDRR), United Nations Office for Coordination of Human Affairs (UNOCHA), International Federation of Red Cross and Red Crescent (IFRC), among others. ACMAD currently organizes special Dialogue Days in the sub-regions during Regional Climate Outlook Forums to bring the DRR and NMHSs communities in the countries together for appropriate interaction for user needs and feedback information.

Science for Weather Information and Forecasting Techniques (SWIFT)
(B. Lamptey, ACMAD)

This UK Global Challenges Research Fund supported a research project that aims to (i) offer significant improvements in weather forecasts in Africa and the tropics, from hourly to seasonal timescales; (ii) Build capacity among UK and African partners to improve, maintain and evaluate operational tropical forecasts in future; (iii) Develop African capacity for sustained training of forecasters.

The UK partners are University of Leeds, National Centre for Atmospheric Science, Centre for Ecology & Hydrology, UK Meteorological Office, University of Reading. The African partners are ACMAD, Kenya (KMD, ICPAC and Univ. of Nairobi), Senegal (ANACIM and UCAD), Nigeria (FUTA, NiMET), Ghana (KNUST, GMet).

SAWIDRA Western Africa
(S. Traoré, AGRHYMET)

Seydou presented the SAWIDRA-WA project. After a reminder about the objectives and the expected results as well the list of final beneficiaries of the project, Seydou gave an update of the activities

already implemented by the project such as the organization of the 2017 RCOFs in West Africa (PRESAGG and PRESASS), tests of WRF/NWP model (07 days of Precipitation and Temperature forecasts).

SAWIDRA Eastern Africa
(A. Salih Babiker, ICPAC)

This presentation reports the current progress in the SAWIDRA project in Eastern Africa implemented by ICPAC in Nairobi, Kenya. The project has several components in Numerical Weather Prediction (NWP), Hydrological Forecasting and Disaster Risk Management (DRM). ICPAC is working to improve the human and technical capacity of the National Meteorological and Hydrological Services (NMHSs) in weather and flood forecasting. The products from these improvements are communicated to the DRM sector for a better mitigation of severe weather impacts. Aboubakar then detailed the on-going activities, notably those related to (i) NWP using the WRF model for precipitation forecast, (ii) Seasonal forecasts, (iii) experimentation of High Resolution 04 km NWP, (iv) experiment hydrological and flood forecast on Juba-Shabele basin.

SAWIDRA Southern Africa
(T. Moitlhobogi, SADC-CSC)

SAWIDRA project for Southern Africa is implemented by SADC Climate Service Centre and intends to develop the capacity to use Numerical Weather Prediction (NWP) models and Regional Climate Models for seasonal climate prediction by the NMHSs.

The project has four major components: the improvement of meteorological infrastructure equipment for catering early warning system in Member States countries; generation and dissemination of extreme weather and climate information services for disaster risk reduction; capacity building in early warning at national and regional levels and the project management.

The expected outputs of the project are: upgrading of Regional Telecommunication and observational Network equipment; improvement of forecast capacity and products accuracy; an operational early warning system; and capacity building in risk management. The outcome of the project will be measured in the improvement of the preparedness to risk and socio-economic gains in SADC member states. Then project is also addressing precipitation and flood forecasts, seasonal agricultural onset forecasts and support the organization of SARCOF.

SAWIDRA Central Africa
(E. Mbaitoubam, CAPC-AC)

SAWIDRA Central Africa is implemented by the Climate Application and Prediction Centre of Central Africa (CAPC-AC).

As the CAPC-AC is a newly created institution in central African for Climate, it includes institutional support to make CAPC-AC operational. The creation of this regional centre is the outcome of a process that began during the Climate Outlook Forum organized by ACMAD for the Central Africa region. This

process was consolidated by the various ministerial declarations and supported by the WMO, CEMAC and ECCAS.

ECCAS has been proactive in mobilizing resources to support the Centre and the SAWIDRA project is the first project that is managed by the Centre.

The presenter detailed the four components of the project, the expected results and the budget of the project. The Project Management Unit of the project is operational since July 2018; so far the project organized the Central Africa RCOF and edited 03 bulletins. The project will also co-organize with AfDB and ACMAD a Continental SAWIDRA Technical Meeting in November 2018 in Douala.

Assessing NWP outputs with Satellite imagery in Daily Operational Forecast
(D. Kone, EAMAC)

Mr Kone presented several methods to assess NWP outputs using mainly MSG satellite data. The following steps are used: (i) assess only the analysis charts (Initial state), (ii) find out and identify on the satellite data the various weather events at different scales and layers (waves, upper level structure: cold and dry air, centres of action, ITCZ, ITD, CAB, AEJ, STJ, TEJ, Convective Clusters, etc.), (iii) match the weather events with the appropriate level and parameters and (iv) assess the possible bias/error. From a general point of view, for an adequate quality assessment a good understanding of atmospheric dynamic is required.

New approaches for monitoring agricultural risk in developing countries
(M. Young, University of Reading)

The TAMSAT AgriculturaL EaRly warning sysTem (TAMSAT-ALERT) is a new decision support tool designed to provide early-warning of meteorological risk to agriculture, using information about the state of the land surface, historical weather and seasonal forecasts. The modular framework of TAMSAT-ALERT enables it to be applied to a variety of metrics and environmental data sources (e.g. satellite and ground-based) to quantitatively assess the likelihood of adverse weather-related events. Importantly, TAMSAT-ALERT can provide skilful assessments such events up to 2 months in advance, illustrating its capability of being a highly valuable tool for early warning.

DRR at national level, example of Côte d'Ivoire
(D. Konaté and B. Mobio, SODEXAM/CURAT -UFHB/MINESSUD)

SODEXAM has set up an Early Warning system since 2012 for the district of Abidjan, especially dedicated to monitor extreme weather events (such as heavy precipitation). It consists of a network of 15 rain gauges and a forecaster team. This system produces, notably using MSG data, warning bulletins every 03 days, in particular for civil protection services.

Discussions and Recommendations

After the presentations there were a number of points that were discussed in plenary including:

- SAWIDRA projects need to accelerate the procurement process for the infrastructure and to communicate with countries regarding the equipment foreseen to be delivered at national level;

- SAWIDRA projects need to increase coordination among the project in order to harmonize work; SAWIDRA projects were also invited to involve universities and River Basin Organisations as well as to improve communication about their activities at all levels (regional and national);
- The Forum also encourages AfDB to prepare for a continuation of the projects in order to allow fully exploitation of the investment made during this first SAWIDRA project.

Session 6 contributed to recommendation #15 and #16

SESSION 7 - EO PROJECTS AND INITIATIVES (LAND)

Chairperson: J. Wasambo, AUC
Rapporteurs: V. Nietosvaara, EUMETSAT + M. B. Saley, GMES&Africa

Session purpose and Content

This session, chaired by J. Wasambo, AUC, was dedicated to EO projects and initiatives for Land (natural resources and water management).

Session contributions

AfriCultuReS - Enhancing Food Security in African Agricultural Systems
(J. Suarez, GMV)

AfriCultuReS is an EU H2020 funded project (Grant Agreement No 774652) that aims to co-design, co-develop and demonstrate an integrated agricultural monitoring and early warning system to support improved decision-making in the field of food security in Africa. AfriCultuReS will apply geospatial science to support sustainable agricultural development, natural resource management, biodiversity conservation, and poverty alleviation. The Project will holistically address agricultural risk assessment in a spatial explicit manner, attending the regional particularities and main drivers, and associated long term dynamics of agricultural production of Africa, including but not limited to; meteorology, climate change, improper use of resources, health issues, gender issues, conflict, and socio-economic environment. AfriCultuReS is implemented in the context of GEO (GEOGLAM, AfriGEOSS, EuroGEOSS), Copernicus and GMES & Africa, programmes to which the project will contribute.

Use of MESA station for ICPAC G&A project
(V. Otieno, ICPAC)

Ms Otieno presented the overview of MESA station for ICPAC G&A project. The objective of the project is a long term management of natural resources in East Africa by providing decision and policy makers with environmental information.

Consortium consists of five institutions, led by IGAD. They have four result areas: Strengthening infrastructure, consolidation and extension of natural resources, capacity building and outreach.

The objectives cover Protected Area monitoring, Agriculture monitoring and Rangeland monitoring.

- Protected Area Monitoring aims at monitoring the effects of climate change, human population growth, vegetation evolution, fire and hotspot monitoring. They also study the impacts of extreme weather conditions to human health.
- Agriculture monitoring covers crop condition monitoring and forecasts.
- Rangeland monitoring helps in observing the changes in pastures and the movement of livestock.

Water and Natural resources management in Central Africa
(D. Kengni Kuitcha, CICOS)

The presentation described the project AMESD and MESA in Central Africa, followed by information about GMES Central Africa and thirdly information about communication strategies. Seven countries involved in the AMESD-MESA in Central Africa have built services including the monitoring of water resources for river navigation and the monitoring of hydrological balance of the sub-basins of the Central Africa region.

Further, the objective of G&A in water management and natural resources is to develop consolidate, improve and operationalise the applications already developed within AMESD-MESA projects. In addition to monitoring of water resources and hydrological balance this activity aims at monitoring the sub-forest areas within the Central basin of the Congo Basin.

The communication strategy focuses on workshops and forums, and on disseminating the results through media internet and social media as well as on working together with the Universities in the region.

Natural resources management in Western Africa
(T. Ba, CSE)

The Centre de Suivi Ecologique (CSE) is an association created in 1993 that brings together the State of Senegal, the private sector, donors, NGOs, among others. The interventions of CSE have extended over the years to one of the various fields covering, support for regional planning and development, urban management, scientific and technical support for sustainable land management, support for decentralized management and natural resources dynamics, environmental and social assessments, monitoring of poverty alleviation efforts, support for combating the negative effects of climate change and coastal erosion, etc.

Taibou Ba then described the project and consortium led by CSE within GMES&Africa. The objective of CSE project is to improve the knowledge of West African wetlands from a rational and sustainable management perspective to contribute to food security and enhance ecosystem resilience through the use of EO data.

Discussion and recommendations

Following the presentation, the following points were raised:

Regarding the GMES&Africa project led by CSE, Dr Ba clarified that two sites will be selected in each country. The CSE will work in each country with the national institution responsible for wetlands management.

ICPAC clarified that they are working closely with the national governments and institutions, through workshops, to assess how project data are made available and used in each country.

Session 7 contributed to recommendations #12 to #14.

CLOSING REMARKS

The 13th EUMETSAT User Forum in Africa ended with a closing ceremony, which included interventions of Paul Counet (EUMETSAT), Jolly Wasambo (African Union Commission) and Daouda Konaté (SODEXAM).

M. Counet thanked SODEXAM for their support and dedication on the hosting of the Forum. He assured participants that EUMETSAT will have a close look at all recommendations and take actions in order to facilitate and follow-up their implementation in the coming two years.

M. Wasambo thanks the Republic of Côte d'Ivoire and EUMETSAT for the organisation of the Forum. The back to back organisation of the Forum with the ECOWAS Hydromel Africa Forum and the G&A Technical Expert Meeting in Abidjan has allowed a very intense work and exchanges among all stakeholders. He particularly welcomed the good spirit of sharing good practices and lesson-learned during the Forum, and indicated to need to keep the same cooperative spirit for the implementation of the recommendation raised during the Forum.

M. Konaté thanked all participants for their commitment and contribution throughout the various sessions of the Forum. As president of the WMO RA-I, he highlighted the need to pursue and consolidate the cooperation with EUMETSAT. The usage of Earth observation in Africa is improving and institutions throughout Africa are demonstrating a great level of expertise. With Copernicus and Meteosat Third Generation, the potential impact of EO on Sustainable development in Africa is increasing, and the challenge in the years to come will be for Africa to make sure it can access and fully exploit these resources.

EUMETSAT POINT OF CONTACT

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LIST OF ABBREVIATIONS

ACMAD	African Centre for Meteorological Application for Development
ACP	African, Caribbean and Pacific Group of States
AfDB	African Development Bank
AGRHYMET	Centre Régional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle
AIS	Automatic Identification System
AMCOMET	African Ministerial Conference on Meteorology
AMESD	African Monitoring of the Environment for Sustainable Development
AMSAF	African Meteorological Satellite Application Facility
ASCAT	Advanced Scatterometer
ASECNA	Agence pour la Sécurité de la Navigation Aérienne en Afrique et à Madagascar
ASMET	African Satellite Meteorology Education and Training
AUC	African Union Commission
AUSWG	African Union Member State Working Group
AWGDRR	Africa Working Group on Disaster Risk Reduction
BNETD	Bureau National d'Etudes Techniques et de Développement
CAPC-AC	Climate Application and Prediction Centre of Central Africa
CCD	Cold Cloud Duration
CDSF	ClimDev Africa Special Fund
CEDARE	Centre for Environment and Development for the Arab Region and Europe
CEMAC	Central African Economic and Monetary Community
CGMS	Coordination Group for Meteorological Satellites
CICOS	Commission Internationale du bassin Congo-Oubangi-Sangha
CIGN	Centre d'Information Géographique et du Numérique
ClimDev	Climate Information for Development in Africa
CM-SAF	Climate Monitoring SAF
CSE	Centre de Suivi Ecologique
CSIR	Council for Scientific and Industrial Research
CURAT	Centre Universitaire de Recherche et d'Application en Télédetection
DEVCO	International Cooperation and Development – European Commission
DIAS	Data Information Access Service
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DVB	Digital Video Broadcasting
DWD	German Weather Service (Deutscher Wetterdienst)
EAMAC	Ecole Africaine de la Météorologie et de l'Aviation Civile
EC	European Commission
ECCAS	Economic Community of the Central Africa States
ECMWF	European Centre for Medium-Range Weather Forecasts
ECOWAS	Economic Community Of Western African States
EDF	European Development Fund
ENACTS	Enhancing National Climate Services
EO	Earth Observation
EPS	EUMETSAT Polar System
EPS-SG	EUMETSAT Polar System – Second Generation
ESA	European Space Agency
EU	European Union
EUMETCast	EUMETSAT's Broadcast System for Environmental Data

EWS	Early Warning System
FCI	Flexible Combined Imager
FFG	Flash Flood Guidance
GEO	Group on Earth Observation
GEOGLAM	Global Agricultural Geo-Monitoring
GEOSS	Global Earth Observation System of Systems
GFCS	Global Framework for Climate Services
GFCS-ACP	Global Framework for Climate Services – African, Caribbean and Pacific
GFS	Global Forecast System
GHACOF	Greater Horn of Africa Climate Outlook Forums
GIS	Geographical Information System
GMES	Global Monitoring of the Environment and Security
HRST	Human Resources, Sciences and Technology
ICPAC	IGAD Climate Prediction and Applications Centre
IFRC	International Federation of Red Cross and Red Crescent
IGAD	Intergovernmental Authority on Development
ILWIS	Integrated Land and Water Information System
IMTR	Institute for Meteorological Training and Research
IOC	Indian Ocean Commission
IODC	Indian Ocean Data Coverage
IPCC	Intergovernmental Panel on Climate Change
ITC	International Institute for Geo-Information Science and Earth
ITCZ	Inter Tropical Convergence Zone
JRC	Joint Research Centre, European Commission
JWG	Joint Working Group
LDC	Least Developed Countries
LI	Lightning Imager
LME	Large Marine Entity
LMS	learning management system
LNB	Low Noise Block
LST	Land Surface Temperature
LTI	Lightning Threat Index
MAPS	MTG Africa Preliminary Study
MEA	Multilateral Environment Agreement
MESA	Monitoring of Environment and Security in Africa programme
MET-8	Meteosat-8
MOI	Mauritius Oceanographic Institute
MOOC	Massive Open Online Courses
MSG	Meteosat Second Generation
MTG	Meteosat Third Generation
NARSS	National Authority for Remote Sensing and Space Sciences
NDVI	Normalized difference vegetation index
NFCS	National Framework for Climate Services
NMHS	National Meteorological and Hydrological Service
NWP	Numerical Weather Prediction
OCIMS	Oceans and Coastal Information Management Systems
OSS	Sahara and Sahel Observatory
PFZ	Potential Fishing Zone
PICSA	Participatory Integrated Climate Services for Agriculture

PR	Permanent Representative
PRESAC	Prévisions Saisonnières Climatiques en Afrique Centrale
PRESAGG	Prévisions Saisonnières Climatiques pour les pays du Golfe de Guinée
PRESASS	Prévisions Saisonnières Climatiques pour la zone soudano- sahélienne
PUMA	Preparation for the Utilisation of Meteosat Second Generation in Africa
RAB	Rwanda Agriculture Board
RA-I	Regional Association One (WMO)
RAIDEG	RA-I Dissemination Expert Group
RARS	Regional Advanced Retransmission Services
RARS-DRR	Regional Advanced Retransmission Services – Disaster Risk Reduction
RCC	Regional Climate Centre
RCMRD	Regional Centre for Mapping of Resources for Development
RCOF	Regional Climate Outlook Forums
REA	Rural Economy Agriculture
RECs	Regional Economic Communities
RIC	Regional Implementation Centre
SADC	Southern African Development Community
SADC-CSC	Southern African Development Community – Climate Services Centre
SAF	Satellite Application Facility
SARCOF	Southern African Regional Climate Outlook Forum
SATURN	Satellite User Readiness Navigator Portal
SAWIDRA	Satellite and Weather Information for Disaster Resilience in Africa programme
SODEXAM	Société d'Exploitation Aéroportuaire Aéronautique Météorologique
SPIRITS	Software for the Processing and Interpretation of Remotely sensed Image Time Series
TAMSAT	Tropical Applications of Meteorology using SATellite data and ground-based observations
UKMO	UK Met Office
UNOCHA	United Nations Office for Coordination of Human Affairs
UPS	Uninterruptible Power Supply
VLab	Virtual Laboratory (WMO)
WIS	WMO Information System
WMO	World Meteorological Organization
WRF	Weather Research and Forecast

ANNEXES

Programme of the Forum **46**

Opening Ceremony Speeches **544**

List of participants **700**

Kigali Declaration **734**

Photos **80**

PROGRAMME OF THE FORUM

FORUM DES USAGERS D'EUMETSAT EN AFRIQUE
24-28 Septembre 2018 - Abidjan

EUMETSAT USER FORUM IN AFRICA
24-28 September 2018 - Abidjan

PROGRAMME OF THE FORUM

Monday 24 September 2018 (am)			
Opening of the Forum			
10:00	Opening Ceremony (separate agenda)		
11:00	*Group Photo and coffee break*		
11:00	Media interviews (upon invitation)		
Introduction to the 13th EUMETSAT User Forum in Africa			
11:30	Introductory remarks	D. Konaté	President WMO RA-I and PR of Côte d'Ivoire with WMO
11:40	**Objectives and programme of the Forum (& review of 12UFA recommendations)**	P. Counet, V. Gabaglio	EUMETSAT
11:55	**Integrated African Strategy on Meteorology - Status and way forward**	J. Mukabana	AMCOMET
12:15	**African Union Space Policy and Strategy (inc. GMES&Africa programme)**	M. Ouedraogo	African Union Commission
12:35	Questions and answers		
12:45	*Lunch break*		

FORUM DES USAGERS D'EUMETSAT EN AFRIQUE

EUMETSAT USER FORUM IN AFRICA

24-28 Septembre 2018 - Abidjan

24-28 September 2018 - Abidjan

Monday 24 September 2018 (pm)			
14:00	Introduction of the participants		
Session 1 - Overview of EUMETSAT Programmes			
Chairperson: D. Konaté, SODEXAM Rapporteurs: E. Barisano, EUMETSAT + F. Eklou SODEXAM			
14:30	**Status of EUMETSAT programmes MSG, MTG, EPS, Jason and future programmes**	A. Ratier	EUMETSAT
15:10	**EUMETSAT Data access and User services**	S. Wannop	EUMETSAT
15:40	**EUMETSAT SAF activities**	C. Traeger	EUMETSAT
16:00	*Coffee break*		
16:15	**EUMETSAT Training activities**	M. Higgins	EUMETSAT
16:30	**Report of RAIDEG activities**	M. Diop Kané	RAIDEG Chair
16:45	**Copernicus and EUMETSAT contribution hereto**	P. Counet	EUMETSAT
17:00	Q&A, discussion		
17:30	*End of Session 1*		
18:00	*Cocktail dinner - Hotel Azalai*		

FORUM DES USAGERS D'EUMETSAT EN AFRIQUE

EUMETSAT USER FORUM IN AFRICA

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Tuesday 25 September 2018 (am)			
Session 2 - Meteosat Third Generation and Africa			
Chairperson: J. Mukabana, WMO Rapporteurs: P. Counet, EUMETSAT + J. Kagenyi, IMTR			
09:00	Introductory remarks	A. Ratier	EUMETSAT
09:10	**MTG programme**	D. Fayard	EUMETSAT
09:30	**Roadmap for transition to MTG in Africa**	V. Gabaglio D. Fayard	EUMETSAT
09:45	Outcome of RAIDEG discussion on MTG	M. Diop Kané	RAIDEG Chair
10:00	Discussion		
10:20	*Coffee break*		
Session 3 - Climate Monitoring and Services			
Chairperson: B. K. Djeri- Alassani, ECOWAS Rapporteurs: H. Trebossen, EUMETSAT + L. Razafindrakoto, ACMAD			
10:35	**African Climate Change policy and intra-ACP Programme on Climate Service and related applications**	H. Nyambe	AUC
10:50	**GFCS status and WMO contribution to intra-ACP CS programme**	F. Lucio	WMO
11:10	**Architecture for space-based climate observation**	P. Counet	EUMETSAT
11:30	**Copernicus Climate Change Service**	J.-N. Thépaut	C3S
11:50	**Satellite data in support to Climate Service (Climate SAF)**	S. Kothe	CM-SAF
12:10	**Enhancing National Climate Services initiative, or ENACTS**	T. Dinku	IRI
12:20	Question and answer		
12:30	*Lunch break*		

FORUM DES USAGERS D'EUMETSAT EN AFRIQUE

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Tuesday 25 September 2018 (pm)			
Session 3 - Climate Monitoring and Services Cont'...			
Chairperson: B. K. Djeri- Alassani, ECOWAS Rapporteurs: V. Nietosvaara, EUMETSAT + L. Razafindrakoto, ACMAD			
14:00	**Long-term rainfall monitoring and agricultural early warning across Africa**	R. Maidment	Uni Reading
14:20	**ESA EO4SD Climate Cluster - Earth Observation in support of Climate Resilience**	C. Domenech	GMV
14:40	**WASCAL activities based on Earth observation**	G. Forkuor	WASCAL
15:00	**Use of CM SAF data, example in Cote d'Ivoire**	D. Konate	SODEXAM/MIRAH/ CRO/MINADER
15:20	**Role of ACMAD in the implementation of Climate Service in Africa**	B. Lamptey	ACMAD
15:40	Discussion		
16:00	Coffee break		
16:15	Group discussion - Implementation of the intra-ACP Climate service		
16:30	Group #1 - Central Africa	ECCAS/CEMAC	
	Group #2 - Western Africa	AGRHYMET / ECOWAS	
	Group #3 - Southern Africa	SADC-CSC	
	Group #4 - Eastern Africa	IGAD/ICPAC	
	Group #5 - Indian Ocean	IOC	
	Group #6 - North Africa (MTG North Africa)	NMHS	
18:00	*End of Session #3 - End of Day #2*		
18:30	*EUMETSAT Dinner - Le Wafou*		

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Wednesday 26 September 2018 (am)			
08:30	Outcome of group discussion from Session #3 (intra-ACP Climate services)		
Session 4 - Training, stations and Data access			
Chairperson: M. Diop Kané, RAIDEG Chairperson Rapporteurs: C. Traeger, EUMETSAT + W. Balogh (WMO)			
09:00	**Use of EUMETCast station for agro-meteorological applications**	S. Traoré	AGRHYMET
09:15	**Use of PUMA station for nowcasting applications**	J. Kagenyi	IMTR
09:30	**Presentation of CIGN activities**	C. N'Doume	CIGN/BNEDT/ CNTIG/ASECNA
09:45	*Coffee break*		
10:00	Group discussion on data acess (station) and training		
	Group #1 - French speaking NMHS	RAIDEG member	
	Group #2 - English speaking NMHS	RAIDEG member	
	Group #3 - tbd		
12:00	*End of session #4, Lunch break*		

Wednesday 26 September 2018 (pm)	
Technical visit	
13:00	Departure for the Technical Visit
13:30	Visit CIGN/BNETD
15:00	Departure from CIGN/BNETD
15h15	Visit Lagoon Ebrié
17h30	End of Lagoon visit
18:00	*Back to Azalaï Hotel - End of Day #3*

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Thursday 27 September 2018 (am)			
Session 5 - Marine Applications			
Chairperson: T. Ouattara, AUC Rapporteurs: S. Wannop, EUMETSAT + D. Kirugara, GMES&Africa			
09:00	**Sentinel-3 Marine products**	M. Higgins	EUMETSAT
09:20	**EUMETSAT training on Marine applications**	C. Traeger	EUMETSAT
09:40	**G&A implementation in Western Africa**	D. Azumah	Uni Ghana
10:00	**G&A implementation in Southern Africa**	G. McFerren	CSIR
10:20	**G&A implementation in Northern Africa**	I. Abou El-Magd	NARSS
10:40	**G&A Implementation in Indian Ocean and Eastern Africa**	O. Gooroochurn	MOI
11:00	*Coffee break*		
11:20	Visualisation of S3 product on the e-station	A. Royer	JRC
11:40	**Use of satellite data for marine meteorology**	L-A. Simpson	SAWS
12:00	Open discussion on Marine application and related training		
12:45	*Lunch*		

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Thursday 27 September 2018 (pm)			
Session 6 - Disaster Risk Reduction			
Chairperson: A. Diane, AUC Rapporteurs: H. Trebossen, EUMETSAT + D. Goudou, AfDB			
14:00	**International Charter: Space and Major Disaster**	S. Wannop	EUMETSAT
14:10	**Overview of SAWIDRA projects**	J. Kabyemera	AfDB
14:25	**SAWIDRA Continental (RARS Africa and NWP)**	B. Lamptey	ACMAD
14:45	**SAWIDRA Western Africa**	S. Traoré	AGRHYMET
15:05	**SAWIDRA Eastern Africa**	A. Salih Babiker	ICPAC
15:25	**SAWIDRA Southern AFrica**	T. Moitlhobogi	SADC-CSC
15:45	*Coffee Break*		
16:00	**SAWIDRA Central Africa**	E. Mbaitoubam	CAPC-AC
16:20	*Q&A on SAWIDRA*		
16:40	**Assessing NWP outputs with Satellite imagery in Daily Operational Forecast**	D. Kone	EAMAC
17:00	**New approaches for monitoring agricultural risk in developing countries**	M. Young	Uni Reading
17:20	**DRR at national level, example of Côte d'Ivoire**	D. Konate / B. Mobio	SODEXAM/CURAT -UFHB/MINESSUD
17:40	*End of Session 5 & Lunch break*		
Dinner hosted by SODEXAM			
18:30	Bus departure		
19:00	Dinner		
21:30	Return to Azalaï Hotel		

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Friday 28 September 2018 (am)			
Session 7 - EO projects and initiatives (land)			
Chairperson: J. Wasambo, AUC Rapporteurs: V. Nietosvaara, EUMETSAT + M. B. Saley, GMES&Africa			
09:00	**AfriCultuReS - Enhancing Food Security in African Agricultural Systems**	J. Suarez	GMV
09:20	**Use of MESA station for ICPAC G&A project**	E. Kayijamahe	ICPAC
09:40	**Water and Natural resources management in Central Afirca**	D. Kengni Kuitcha	CICOS
10:00	**Natural resources management in Western Africa**	T. Ba	CSE
10:20	**GMES&Africa in Northern Africa**	F. Mar	OSS
10:40	*End of Session 7 & Coffee break*		
Session 8 - Review of the main recommendations			
Chairperson: D. Konate, SODEXAM Rapporteurs: H. Trebossen, EUMETSAT + V. Gabaglio, EUMETSAT			
11:00	Feedback form - 13th EUMETSAT User Forum in Africa		
11:30	Review of the recommendations of 13th EUMETSAT User Forum		
12:30	*Lunch break*		

Friday 28 September 2018 (pm)			
Session 8 - Review of the main recommendations cont'			
Chairperson: D. Konate, SODEXAM Rapporteurs: H. Trebossen, EUMETSAT + V. Gabaglio, EUMETSAT			
14:00	Review of the recommendations of 13th EUMETSAT User Forum (cont')		
14:45	Adoption of the recommendations from thw 13th EUMETSAT User Forum in Africa		
15:00	*End of Session 8*		
15:00	***Closing remarks***		
15:30	*End of Forum and departure of the participants*		

OPENING CEREMONY SPEECHES

Statement by Alain Ratier, EUMETSAT Director-General

[Protocol observed]

I am delighted to open this 13th EUMETSAT User Forum in Africa, here in Abidjan, Côte d'Ivoire, and it is also an honour to do so after the signing of the Abidjan Declaration.

Less than one year ago, the Heads of State and Government of Africa and Europe were gathered here for the 5th African Union – European Union Summit and adopted a final declaration that encourages, quote, "the use of space-based technologies and information", especially "for enhancing adaptive capacity to the adverse impacts of climate change and related shocks, and [to] increase resilience to environmental degradation".

In the field of meteorological observation and climate, our Forum and the capacity-building projects that we are going to discuss respond to this political encouragement through action, based on the continuation of the cooperation developed over several decades between Europe and Africa.

For EUMETSAT, cooperation with Africa is a commitment of the "Challenge 2025" strategy adopted by its 30 Member States, which wish to provide Africa the opportunity to benefit from the European meteorological satellite systems that they fund.

As part of this cooperation, our foremost commitment is to ensure real-time access to the products of observations from our satellites, to which are now added those from the Copernicus Sentinel satellites that we operate for the European Union.

Our second commitment is to cooperate with other European and African institutional actors, in particular the European Commission and the African Union Commission, as well as the World Meteorological Organization, to allow users to exploit these data. And to enable them to provide African decision-makers with the information services they need for the sustainable economic growth destined for Africa. This growth depends on the capacity to ensure the meteorological security of infrastructure, of goods and of people, faced with the impacts of climate change, and this brings us back to the final declaration of the 5th African Union – European Union Summit.

Finally, EUMETSAT supports the user training programmes carried out by the regional Centres of Excellence in the WMO VLab Programme.

We know that our contribution has meaning only if it fits within the framework of capacity-building projects supported by the African Union, the European Union, the World Meteorological Organization and other partners such as the African Development Bank.

This institutional support both guarantees consistency with the African strategy on meteorology and space and the common Africa – European Union strategy, and the long-term support of governments to user communities, whose commitment is crucial to the success of these projects.

Within this framework, EUMETSAT's ambition is to remain a trusted partner of the African stakeholders at the scientific, technical and operational levels.

Finally, we cannot talk about strategy without long-term commitment. And our commitment is to provide observations of our Meteosat and Metop satellites until 2040, to help the Integrated African Strategy on Meteorology.

To conclude, I would like to thank the Government of Côte d'Ivoire and especially Mr Amadou Koné, Minister of Transport, for hosting this 13th Forum in such excellent conditions, as well as SODEXAM and the EUMETSAT teams for having organised it.

Thank you for your attention.

Statement by Amadou Koné, Ministry of Transport of the Republic of Côte d'Ivoire

[Protocol observed]

On behalf of the Government of the Republic of Côte d'Ivoire and in my own name, I would like to welcome all the diverse participants, who for five days will participate in the 13th EUMETSAT User Forum in Africa.

Ladies and gentlemen,

Floods, storms and droughts are climate phenomena whose frequency and severity are on the increase.

The theme of this 13th User Forum is support from satellites for the reduction of risks from natural disasters and for resilience to climate change. Its main objective is to inform and to strengthen the well-established dialogue between EUMETSAT and its user community in Africa, in particular the African national meteorological and hydrological services and the institutional partners, in order to optimise the use of satellite data and products throughout the continent.

Additional efforts will be required to establish reliable information systems, in order to ensure correct interpretation and to deliver mechanisms supporting a wide range of specialised applications. We are committed to working in close cooperation with partners such as EUMETSAT and the World Meteorological Organization (WMO) within the framework of various training programmes, to see to it that the adverse effects of climate change are also covered within the range of products we offer to people for better resilience. In view of both the variability and the change in climate, it is important to strengthen the support provided to the use of satellite and data products and to continue it over the long term, in order to develop and promote wide-ranging access to meteorological and hydrological information and to customised products and services.

Ladies and gentlemen,
Côte d'Ivoire, along with the entire scientific community, notes that support from satellites to reduce the risks of natural disasters requires a global and strong user-oriented approach and that the provision of information on the atmospheric parameters and therefore on the climate, for adaptation and for risk management, will continue to be a priority for our Government. We recognise that it is necessary to make changes to the climate products so that they can serve as an aid for decision-making for policy-makers in various sectors.

For all of our countries, there is a real need to develop customised products that reveal climate impacts, such as agricultural forecasts and crop prospects, hydrological prospects, energy production and consumption forecasts, as well as early warnings concerning the health sector.

Developing capacities is a major trans-sectoral pillar of the Global Framework for Climate Services. It focuses explicitly on institutional capacities and on capacities related to infrastructure, those related to the procedures and those concerning human resources...

Ladies and gentlemen,

The partnerships established in the field of satellite remote sensing are extremely important, and we set great store by our cooperation with EUMETSAT. The contribution to African meteorology and hydrology that comes with the use of products from Meteosat Second Generation (MSG) and the setting up of the AMESD Project (African Monitoring of the Environment for Sustainable Development), now MESA (Monitoring of Environment and Security in Africa) and, in the near future, the implementation of the GMES-Africa Project (Global Monitoring for Environment and Security) is extremely valuable, and we are very grateful to EUMETSAT.

I would like to point out that, here in Africa, we need more accurate and more relevant local and regional knowledge. And this Forum is an excellent opportunity to take up that challenge. I therefore invite you all to work towards and think about solutions so that the continent is an active stakeholder, not only as a consumer but also as a designer of these satellite and data products for better resilience to climate change.

Honourable Guests,

I wish you every success in your work and declare this 13th EUMETSAT User Forum in Côte d'Ivoire open.

Thank you.

Statement by Dr Joseph R Mukabana, WMO Director, Offices for Africa and Least Developed Countries & AMCOMET Secretariat

[Protocol observed]

On behalf of the Secretary General of the World Meteorological Organization (WMO), Prof. Petteri Taalas, who sends his regrets for not being here with you today, I wish to extend my gratitude to the Government and people of Cote d'Ivoire for hosting the 13th Session of the EUMETSAT User Forum in Africa and welcome all participants to the beautiful city of Abidjan.

My delegation and I wish to thank the organizers for the excellent facilities put at our disposal and for the very warm welcome accorded to us.

Excellencies, Distinguished Participants, Ladies and Gentlemen

You are all aware of the longstanding partnership between WMO-AMCOMET and EUMETSAT and our joint collaboration to support African Member States to enable them to benefit from satellite data – its Application and Use for social economic development. These collaborations include:

- WMO Regional Association I Dissemination Expert Group (RAIDEG) which collects, reviews access to meteorological and environmental data and products by NMHSs and partner organizations; as well as make recommendations on the requirements for products for and on the assignment of priorities, aiming at optimizing product dissemination through EUMETCast or the Global Telecommunications System (GTS).
- Virtual Laboratory for Training and Education in Satellite Meteorology (VLab), which is a global network of specialized training centres and meteorological satellite operators working together to improve the utilisation of data and products from meteorological and environmental satellites;
- African Satellite Meteorology Education and Training (ASMET) which produces online and CD-based learning lessons that teach African forecasters how to enhance their forecasts by making better use of meteorological satellite images and products;
- The on-going face-to-face training for representatives of National Meteorological and Hydrological Services (NMHSs) in the exploitation of satellite data;

You will recall that AMCOMET is the high-level policy mechanism and the inter-governmental authority for the development of meteorology and its applications in Africa. AMCOMET therefore serves as the platform through which sustainable development programmes specific to weather and climate services are harmonized and coordinated in collaboration with the African Union (AU), the Regional Economic Communities (RECs), governments, non-governmental organizations (NGOs) and the private sector, among others.
As part of its mandate - the AMCOMET Task Force on the African Space Programme is expected to collaborate with the AU Space Working Group and with the AUC Department of Human Resources and Science and Technology (HRST) and stakeholders including EUMETSAT, to provide meteorological inputs for the implementation of the African Space Programme.

Excellencies, Distinguished Participants, Ladies and Gentlemen

It is my honour and privilege to inform you that following the 4th Bureau Meeting of AMCOMET which took place last week, on the 20 – 21 September, our partnership with EUMETSAT will further be strengthened with the adoption of the Abidjan Declaration, where we will jointly work towards strengthening African capacities at regional and national levels, in particular in the National Meteorological and Hydrological Services, to ensure a smooth transition to utilizing products from the Meteosat Third Generation (MTG) satellites; specifically, secure access to, and exploitation of MTG satellite data and products in support to the objectives of AMCOMET's Integrated African Strategy on Weather and Climate Services, and in line with the African Space Policy and Strategy.

WMO's deep gratitude goes to Ministers and Commissioners here present for their commitment to invest in the Hydromet sector as well as for their ardent support to the AMCOMET process.

WMO and the AMCOMET communities-at large count on your continued support for the development and enhancement of the sector of meteorology, to enable effective and sustainable contribution to disaster risk reduction (DRR) and to socio-economic development.
With these few remarks, I wish us all fruitful deliberations.

Thank you for your kind attention.

Merci
Asante
Obrigado

Statement by Dr Mahama Ouedraogo, Director for Human Resources, Science and Technology of the African Union Commission

[Protocol observed]

I am deeply honoured to deliver this message on behalf of the Commissioner for Human Resources, Science and Technology of the African Union Commission, who extends congratulations to EUMETSAT on this momentous Forum. Thank you for inviting the Commission to participate as a partner, and as a vital stakeholder in this forum where important African developmental issues are at the center of the agenda.

The African Union Commission also expresses its recognition to the Government of Côte d'Ivoire and all the sponsors for facilitating the participation of various scientists, professional and stakeholders from Africa and abroad in this Forum.

Agenda 2063 recognizes the critical role of space science and technology and has identified the African Outer Space Programme among African Union flagship projects. The objective is to enable Member States to harness space sciences, technologies and innovations for Africa's growth and transformation. The African Outer Space Programme provides a platform to coordinate and harmonize space activities in the continent, and facilitate skills, exchange of knowledge and information among actors with a view to increased synergies towards achieving Agenda 2063 aspirations using economy of scale.

In January 2016, through decision Assembly/AU/Dec.589(XXVI), the Assembly adopted the African Space Policy and Strategy as a step towards the realization of an African Outer-Space Programme to develop capacities in (i) earth observation, (ii) satellite communication, (iii) navigation and positioning, and (iv) space science and astronomy. The African Union is aware of the unique opportunities for the continent to collectively address socio-economic development issues through harnessing space sciences, technologies and innovations to responding to Africa's priorities for growth, and transformation. The Union is also aware that space sciences, technologies are often complex, cost intensive with a high financial risk. Therefore a common continental approach, that is well coordinated and systematic will allow the sharing of these costs, expertise, and the enabling infrastructure, including data; and the collective management of strategic initiatives.

An institutional and operational enabler of the African Space Policy and Strategy is the 3-year GMES & Africa initiative, which is a 30 million EURO programme jointly established by the African Union and European Commissions to address the growing needs of African countries to access and use Earth Observation data for the implementation of sustainable development policies on the continent through the integration and deployment of African requirements and needs in Copernicus Services. Allow me emphasize that this has been possible through the long-standing partnership between Africa and Europe, including in the area of Earth Observation. I therefore wish to take this opportunity to recognize and commend the continuous collaboration and support from the European Commission, which is exemplified by the joint conceptualization, designing and implementation of GMES & Africa.

EUMETSAT is one of the institutions under the EU banner providing technical support to GMES & Africa. It has been equally instrumental in the implementation of GMES & Africa's predecessors, including PUMA, AMESD and MESA. It is therefore no coincidence that this Forum is a platform of

dialogue between EUMETSAT and the African user community, focusing on the transition to the Meteosat Third Generation, on the utilization of Earth Observation for climate change resilience and disaster risk reduction, and on the role of African programmes in continental space and meteorology policies.

Meteorological data and information have indeed proven to be a catalyst that does not necessarily provide an ultimate solution to climate change, but contributes most effectively to preparing vulnerable communities and to the management of climate induced hazards. This therefore calls for a policy commitment, if not shift, to the provision of adequate weather information and climate analyses for disaster mitigation, food security and healthy populations. We must also recognize and be alive to the challenges besetting meteorological services in Africa, including limited capacities and funding as well as low levels of collaboration within and among sector operatives. This is one area where EUMETSAT and other partners have been rendering tremendous support and our anticipation is that this support will be strengthened to increase access to more infrastructure, forecasting systems and capacity development for more accurate weather information on the continent.

On our part, African stakeholders must rise up to the need to engender the necessary political will to strengthen meteorological services, and to capitalize on the existing internal potential as well as international goodwill for this sector. It is therefore imperative for us to promote active sharing of meteorological information to minimize the impact of climate hazards, foster stronger collaboration and partnerships within the Met Community, as well as promote sound environmental and natural resource management.

We at the African Union Commission believe that these are possibilities within our means and our collective endeavors in this direction would yield a safer, healthier, more prosperous and more progressive continent, working hand in hand with its international allies and partners towards the realization of our shared global development goals.

Once again, on behalf of the Commissioner for Human Resources, Science and Technology of the African Union Commission, I thank you for this opportunity and for your keen attention.

Statement by Dr Dr. Anthony Nyong, Director of Climate Change and Green Growth, African Development Bank

[Protocol observed]

It is delightful and pleasant to me to participate in the opening ceremony of the 13th EUMETSAT User Forum in Africa.

The importance of this Forum for Africa has already been alluded to by previous speakers; but let me also add my voice by thanking EUMETSAT for its long standing support to climate and weather services in Africa. EUMETSAT support has been instrumental in building and improving climate information services on the African Continent; as well as in averting the negative effects of extreme weather occurrences while building disaster resistance tools and methodologies.

To ensure an adequate technical and policy framework, EUMETSAT has established cooperation with regional technical centres and African policy institutions. Most significant is the close cooperation established with ACMAD, AGRHYMET; ICPAC/IGAD and SADC; which have the mandate to undertake weather, climate and environmental monitoring in support of socio-economic policies in Africa.

EUMETSAT is in contact with African policy institutions that provide necessary input into projects and initiatives and ensure that they are properly aligned with national, regional and continental policies in as far as climate and weather information services is concerned. It is along these lines that the African Development Bank signed a Memorandum of Understanding with EUMETSAT, with a view to facilitating on both the policy and technical fronts, the support by the African Development Bank to Regional and national climate centres in Africa.

Through this cooperation, EUMETSAT is engaged in the verification of both the technical and technological specifications of the climate and weather equipment for the *Satellite and Weather Information for Disaster Resilience Development in Africa* (SAWIDRA) projects to be procured by the African Development Bank through the ClimDev Africa Special Fund. This equipment includes Regional Advanced Retransmission Service (RARS) receiving stations and High Performance Computers (HPCs) to be installed at the Regional Climate Centres (ACMAD, AGRHYMET, ICPAC/IGAD, SADC and ECCAS). To ensure the harmonization and compatibility of systems across the climate centres, the African Development Bank has coopted EUMETSAT in organizing a Technical Workshop for the SAWIDRA projects in November this year.

As most of you are aware, the Bank has invested considerably in climate and weather information systems both from own funds and leveraging on funds from other partners. The Bank both through the institutional support to African climate institutions project (ISACIP) and the ClimDev Africa Special Fund (CDSF) is supporting the establishment and development of Climate Information Infrastructure across the continent. Over the period 2010- 2013/14, the Bank's the Bank invested UA 24.23 million (USD 35.6 Million) to enhance the capacity of African regional climate centres build their infrastructure that would enable them generate and make widely available relevant climate-related information to end users. The Bank through CDSF is is currently working to enhance the application of climate information services both for the Regional and national climate centres with an investment of over Euro 33 million. These investments coupled with those in the pipeline, including the Hydromet

Programme and working with the Africa Adaptation Initiative will go a long way to towards enhancing the resilience of countries against extreme weather effects. Total projected coverage is expected to cover 1.5 billion people and especially end users in the rural areas.

We are well aware that EUMETSAT operates within a wider framework of the Joint Africa-EU Strategy and the World Meteorological Organization's regional plans. This is with a view to expanding the user base for EUMETSAT data, products and services in EUMETSAT Member States and among WMO Members. With a projected increase in frequency and intensity of extreme weather events - such as severe storms, droughts and floods, a negative impact on agriculture and food and water security, the support by EUMETSAT to African countries cannot be underestimated.

I am certain that the state and scope of cooperation with the African institutions will be discussed at length in the course of this Forum, and all the concerned parties and stakeholders will agree on the trajectory for the improvement of this continuing collaboration. As the African Development Bank is party to this collaborative work, we will work with other partners and stakeholders to ensure a healthier and impactful collaboration as will be agreed at this Forum.

Ladies and Gentlemen, let me take this opportunity to reaffirm the African Development Bank's satisfaction with the support being provided by EUMETSAT, but also confirm the African Development Bank's continued collaboration and cooperation with EUMETSAT.

I thank the Organizers of this Forum and particularly the management of EUMETSAT for inviting us to this important event. I wish you very fruitful deliberations that will culminate into workable solutions that will continuously strengthen Africa's climate and weather prediction systems.

I thank you for your kind attention

Statement by Dr SEKOU SANGARÉ, Commissioner in charge of Agriculture, Environment and Water resources, ECOWÁS

[Protocol observed]

I once again wish to say that it is with great pleasure that I again take the floor on behalf of His Excellency Mr Jean-Claude Kassi Brou, President of the ECOWAS Commission, to wish a very warm welcome to all the participants in the EUMETSAT User Forum here in Abidjan.

I convey ECOWAS's sincere gratitude to the President of the Republic of Côte d'Ivoire, to its Government and to its people, for having accepted to hold the 13th EUMETSAT User Forum in Africa in Abidjan and for the warm hospitality shown to its participants.

The holding of the 13th EUMETSAT Forum following the ECOWAS HydroMet Forum is part of the follow-up to the communiqué adopted here in Abidjan on 21 September 2018, just three days ago, and to the Declaration signed a few moments ago.

This Declaration on the next generation of satellite and data products for meteorological and climate services in Africa prepares the ground for cooperation over the next few years between the European Union and Africa in making a significant contribution to the monitoring of our climate, for better promotion of development that is resilient to climate change.

To the Representative of the European Union in Côte d'Ivoire and to the Director-General of EUMETSAT, I express the sincere feelings of gratitude of ECOWAS and its praise for the support that you provide to the ECOWAS countries.

The technological progress of the satellite and data products should give us more efficient tools for improving our resilience faced with climate change.

This is why we hope that the seven technical sessions of the Forum will make it possible to take stock of the situation and to consider the appropriate channels in order to proceed without pitfalls from Meteosat Second Generation to the Third Generation.

The ECOWAS Commission intends to continue its cooperation with the European Union. It will carry out its role to the utmost to ensure the effective implementation of the commitments made by the Hydromet Forum and the Abidjan Declaration.

For Africa's socio-economic development, the people of our countries need information, products and services adapted to Africa's needs, and the ECOWAS Commission will support all the interesting initiatives that can help achieve this.

Accordingly, ECOWAS has carried out consultations with the CILSS to confirm the endorsement of the AGRHYMET Regional Centre as the Regional Climate Centre of ECOWAS and the Sahel, taking into account the experience it has accumulated since then.

Before closing my remarks, I would like to take the opportunity to thank the European Union for the projects in progress, particularly for those within the framework of the Global Monitoring for Environment and Security (GMES and Africa) and the ACP-EU project on climate services and related applications, whose start-up is planned for 2019.

That said, I now express my hope that our work will meet with the utmost success.

Long live international cooperation.

Thank you.

Statement by H.E. Marie Thérèse Chantal MFOULA, Assistant Secretary General, ECCAS

[Protocol observed]

It is an honour and a pleasure for me, following Kigali in 2016, to take the floor today on behalf of His Excellency Ambassador Ahmad Allam-mi, Secretary-General of the Economic Community of Central African States, who is not able to personally attend this conference. He has instructed me to thank the Government of the Republic of Côte d'Ivoire for the invitation sent to the General Secretariat of ECCAS, for having accepted to host on its territory the 13th EUMETSAT User Forum and for all the wonderful arrangements made to ensure its success.

The Republic of Côte d'Ivoire has an acknowledged commitment to issues in the meteorological, climate, and environmental sector. I urge you, Honourable Minister, to convey to His Excellency the President of the Republic of Côte d'Ivoire, the gratitude of the whole continent for his leadership in this sector.

Honourable Minister, your presence at this ceremony despite your busy schedule amply demonstrates the importance you place on the issues which bring us together today.

As I indicated earlier, on the occasion of the ceremony for the signing of the Abidjan Declaration on the next generation of satellite and data products for meteorological and climate services in Africa, the General Secretariat of ECCAS welcomes the initiatives of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) in Africa in general and in Central Africa in particular.

I would like to take this opportunity to invite the other development partners involved in climate, meteorological and disaster-resilience issues to join EUMETSAT in the framework of these initiatives, through a sincere and mutually beneficial partnership that can help the African continent accelerate the capacity building of our States in their fight to reduce the level of exposure of their populations to the unforeseen events of environmental origin, in accordance with the policies and strategies adopted by the African Union in these areas.

Allow me next to pay deserved tribute to the World Meteorological Organization (WMO) for its constant support to the regional economic communities.

I would like finally to thank, on behalf of the Secretary-General, the other partners in this sector, notably the European Union and the African Development Bank, which provide us support in making the Climatic Application and Prediction Centre for Central Africa operational, thanks to intra-ACP–EU financing for disaster resilience.

Your Excellencies,

Ladies and gentlemen,

As you all know, the EUMETSAT User Forum is an opportunity to strengthen ties and to define the cooperation priorities between EUMETSAT and its African partners. The ECCAS secretariat undertakes to

participate in this noble mission that should allow the States to benefit from the next generation of satellite and data products and strengthen the capacity of governments in meteorological and climate monitoring.

In this regard, it seems to me useful to point out that, in its strategic vision for 2025, ECCAS recognises the importance of the sectors of the fight against climate change, of desertification and drought, of peace and security, and especially of management of disasters of natural or human origin. These sectors are among the strategic intervention priorities upon which it has been focusing its efforts up to now.

Indeed, in our community, climate anomalies and extreme events occur with significant socio-economic and environmental impacts. The Intergovernmental Panel on Climate Change (IPCC) of 2007 indicated that an increase in extreme events will be more probable in the 21st century, with more disastrous consequences, if mitigation and adaptation measures are not taken starting now.

In this context, the actions to carry out in this framework are fully in line with the subregional strategy for risk prevention, disaster management and adaptation to climate change, as well as with the Action Plan for disaster preparedness and response in Central Africa, which is included in the Ministerial Declaration of Libreville of June 2012.

The ECCAS General Secretariat is pleased to note that this Forum will most certainly enable it to learn more and to forge new partnerships for the achievement of the goals of this strategy.

Your Excellencies, ladies and gentlemen,

My hope is that this meeting will be as successful as the organisation that has gone into it. I also express my wish that the outcomes of this Forum act as drivers for the initiatives presently under way on our continent as part of the fight against the vulnerability to climate events, and that they will inspire the efforts that we are currently making with a view to improvement of the climate services in the interest of sustainable development.

I thank you for your kind attention!

Statement by Hugo Van Tilborg, EU Delegation to Côte d'Ivoire

[Protocol observed]

It is with great pleasure that I stand this morning before this audience, full of national authorities in the field of climate change, great scientists, meteorologists in particular, and of course policy-makers, to participate in the opening of this 13th edition of the EUMETSAT Forum.

The European Union is committed to fighting the harmful effects of climate change at all levels. Its commitment is real, concrete and visible and can be described in three parts:

First, we are including climate action in the national economies of the EU, through ambitious objectives to reduce emissions, increase the share of renewable energy and improve energy efficiency.

Secondly, climate action is a key element of our external development policy. The European Commission alone is aiming to spend around 20% of its development portfolio on climate-related projects and programmes.

Finally, climate action is a key issue in our dialogue and cooperation with our partner countries. For example, through the Global Climate Change Alliance (GCCA+), an initiative launched in 2007 by the European Commission. Its objective is to intensify dialogue and cooperation in the field of climate change between the European Union and the most exposed developing countries.

None of our actions could be achieved without reliable and precise data. It is a crucial element to be able to initiate and pursue effective action against climate change. Reliable and accurate data make it possible to make decisions based on factual data and to take effective measures.

That is why the European Union supports several projects and programmes aimed at creating a global framework in Africa for earth observation applications. These include, among others, the GMES and Africa Programme, which is a programme of global monitoring of the environment and security in Africa. The GMES and Africa Programme is also a means to take advantage of and benefit from the continent's potential, by using earth-observation data for noteworthy advances in the field of civil security, health and agriculture. The EU's overall financial contribution to the project as a whole is around 29.5 million. As part of this programme, the European Commission, in partnership with the WMO (World Meteorological Organization), EUMETSAT and the European Space Agency, is mobilising the Copernicus Climate Service and the expertise of the Joint Research Centre of the European Commission (JRC) in Ispra, Italy.

In addition, I am sure that you know much better than I even the abbreviations PUMA, AMESD and MESA. These are three consecutive programmes with a total financial contribution of about 70 million euros from the EU. For its programmes, the European Commission has joined with EUMETSAT and the European Space Agency (ESA) to strengthen infrastructures and carry out training and technical assistance for national meteorological services, regional climate centres, AGRYMET, ministries,

universities and the African Union Commission in order to access, use and provide reliable information on the weather, the climate and the environment. More than 3,500 experts have been trained within the framework of these programmes, and 23 services and applications have been developed in the areas of water management and natural resources as well as in the management of marine and coastal areas.

Moreover, as part of the next intra-ACP programme on climate services, the EU will continue to support the ACP countries and their regional climate centres, the national meteorological services and other institutions in the provision of climate services, in accordance with the Global Framework for Climate Services (GFCS), amounting to 85 million euros. The AGRYMET Regional Centre will receive 8 million euros in financing, to better support the national meteorological services and other institutes concerned.

We also spend close to 54.5 million euros to help strengthen resilience faced with natural disasters in the African, Caribbean and Pacific countries, through the Africa Caribbean Pacific – European Union Natural Disaster Risk Reduction (ACP-EU NDRR) Programme, which was launched in 2011 and is managed by the Global Facility for Disaster Reduction and Recovery (GFDRR).

Apart from announcing the different initiatives of the European Union and their corresponding amounts in euros, I also wish to communicate two key messages:

The implementation of these programmes must be done in close cooperation with the African Union Commission, the regional economic communities and the regional information centres, and the United Nations organisations and other development partners such as the African Development Bank, to avoid duplicating efforts and to optimise the available resources.
We must also ensure that the data obtained and shared be exploitable and usable by the final beneficiaries. To do so, it is essential to develop the notion of service and to transform the data into useful services for ministries and users. This must be the starting point for the design of all programmes, to ensure that our data benefit as many people as possible.

Allow me to reaffirm the European Union's strong commitment to meet this challenge of green growth and resilience to climate change together!

Finally, I would like to take this opportunity to thank EUMETSAT for our fruitful teamwork at the European and Pan-African levels in order to facilitate the access to and the use of crucial climate-related data.

I would like also to very sincerely thank the Government of Côte d'Ivoire, the host country of this Forum, for its commitment and the special attention it pays to climate-related issues.

To all of you, I wish you an excellent Forum and hope that the exchanges will be enriching for the entire world community.

Thank you.

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ABIDJAN DECLARATION

ABIDJAN DECLARATION ON NEXT GENERATION OF SATELLITES PRODUCTS FOR WEATHER AND CLIMATE SERVICES IN AFRICA

Abidjan, Côte d'Ivoire, 24 September 2018

DECLARATION D'ABIDJAN PORTANT SUR LA PROCHAINE GÉNÉRATION DE PRODUITS SATELLITAIRES POUR LES SERVICES MÉTÉOROLOGIQUES ET CLIMATOLOGIQUES EN AFRIQUE

Abidjan, Côte d'Ivoire, 24 septembre 2018

We,

Representatives of the African Union Commission (AUC), the African Ministerial Conference on Meteorology (AMCOMET), and the Regional Economic Communities (RECs) ECCAS, ECOWAS, IGAD, SADC, upon the invitation of the Minister for Transport of the Republic of Côte d'Ivoire, in the presence of the representatives of the World Meteorological Organization (WMO), the ACP Group of States Secretariat, the African Centre of Meteorological Applications for Development (ACMAD), and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT),

Convened in Abidjan, on the basis of our respective mandates and responsibilities to address meteorology, climate and space to enhance regional integration in Africa, on the occasion of the 13th EUMETSAT User Forum in Africa;

Considering the Integrated African Strategy on Meteorology (Weather and Climate Services) endorsed during the 20th Ordinary Session of the African Union Summit of Heads of State and Government in January 2013, and its complementary Implementation and Resources Mobilization Plan approved by AMCOMET during its Third Session in Praia, Cabo Verde 13-14 February 2015;

Nous,

Représentants de la Commission de l'Union Africaine (CUA), de la Conférence des Ministres en charge de la Météorologie (AMCOMET), et des Communautés Economiques Régionales (CERs), CEEAC, CEDEAO, IGAD, SADC, à l'invitation du Ministre des Transports de la République de Côte d'Ivoire, en présence des représentants de l'Organisation Météorologique Mondiale (OMM), du Secrétariat du Groupe des Pays ACP, du Centre Africain pour les Applications de la Météorologie au Développement (ACMAD), et de l'Organisation Européenne pour l'exploitation des Satellites Météorologiques (EUMETSAT),

Réunis à Abidjan à l'occasion du 13ème Forum des Usagers d'EUMETSAT en Afrique, sur la base de nos mandats et responsabilités respectifs en matière de météorologie, de climat et dans le domaine spatial, visant à renforcer l'intégration régionale en Afrique,

Considérant la Stratégie africaine intégrée pour la météorologie (services météorologiques et climatologiques), adoptée lors de la 20ème session ordinaire du Sommet des Chefs d'Etat et de Gouvernement de l'Union Africaine (Janvier 2013), et son Plan complémentaire de mise en œuvre et de mobilisation des ressources, approuvé par AMCOMET lors de sa troisième session à Praia, Cap-Vert, 13-14 février 2015 ;

Noting that this Strategy highlights the importance of meteorological satellites for the monitoring of weather and climate considering the scarcity of land-based weather stations in Africa; and identifies as action that Africa should engage with international partners on the design of numerical weather prediction (NWP) and satellite derived products to better address African requirements; and **further noting** that the NMHS represented at the 12th EUMETSAT User Forum in Africa recommended to AMCOMET and AUC to explore possibility to invest in the development of African-made satellite derived added-value products, which will benefit all African countries;

Notant que cette stratégie souligne l'importance des satellites météorologiques pour la surveillance du temps et du climat compte tenu de la rareté des stations météorologiques terrestres en Afrique et considère que l'Afrique devrait collaborer avec des partenaires internationaux sur la conception de produits de prévision numérique du temps (PNT) et notant en outre que les SMHNs représentés au 12ème Forum des usagers d'EUMETSAT en Afrique a recommandé à AMCOMET et à la CUA d'étudier la possibilité d'investir dans le développement de produits à valeur ajoutée dérivés de satellites fabriqués en Afrique, ce qui profitera à tous les pays africains;

Considering, the African Space Policy and Strategy adopted in January 2016 in Addis Ababa by the African Union Assembly of Heads of State and Government, that envisions an African Space Programme that is user-focused, competitive, efficient, innovative and focused on earth observation, navigation and positioning, satellite communications, and space science and astronomy;

Considérant la Politique Spatiale en Afrique et la Stratégie Spatiale Africaine, adoptée par la Conférence des Chefs d'Etat et de Gouvernement de l'Union Africaine à Addis-Abeba en janvier 2016 qui conçoit un programme spatial africain orienté vers les utilisateurs, compétitif, efficace, innovant et se concentrant sur l'observation de la Terre, la navigation et le positionnement, les communications satellitaires, ainsi que les sciences spatiales et l'astronomie ;

Noting also that the African Space Strategy identifies Weather and Climate as key societal needs which can be better addressed using earth observation satellites; and also identifies international partnerships as opportunities to support the co-development of products and services to address remaining gaps and pursue new learning opportunities to build expertise in the region through active participation in global space initiatives and **further noting** that the AMCOMET Task Force on the African Space Program, in collaboration with the African Space Stakeholders Working Group, is expected to provide meteorological inputs to the African Space Programme;

Notant en outre que la stratégie spatiale africaine identifie la météorologie et le climat comme des besoins sociétaux essentiels qui peuvent être mieux traités en exploitant des satellites d'observation de la terre; et identifie également les partenariats internationaux comme des opportunités pour soutenir le co-développement de produits et services afin de combler les lacunes restantes et rechercher des opportunités d'apprentissage visant à renforcer l'expertise dans la région via une participation active dans les initiatives spatiales mondiales, et **notant également** que le groupe de travail AMCOMET sur le programme spatial africain, en collaboration avec le Groupe de travail des acteurs africain sur l'espace, fournira des indications sur les aspects météorologiques au Programme spatial africain;

Noting also that implementation of the Global Framework for Climate Services (GFCS) provides the needed coordination mechanism to enhance science-based climate information and services that support decision-making in climate-sensitive areas such as agriculture and food security, disaster risk reduction, energy, health and water resources management; and further noting that an intra-ACP programme funded by the EDF is supporting the implementation of Climate Services in Africa;

Notant également que la mise en œuvre du Cadre Mondial pour les Services Climatologiques (CMSC) fournit le mécanisme de coordination nécessaire pour améliorer les informations climatologiques scientifiques et pour fournir des services qui soutiennent la prise de décisions dans des domaines sensibles au climat tels que l'agriculture et la sécurité alimentaire, la réduction des risques de catastrophe, la gestion de l'énergie, de la santé et des ressources en eau, et notant en outre qu'un programme intra-ACP financé par le FED soutient la mise en œuvre des services climatologiques en Afrique;

Considering also the final Declaration of the 5th AU-EU Summit, held in Abidjan in November 2017, which underlines as part of the Joint Strategic Priority Area Two, the need to foster the use of space-based technologies and information in the context of enhancing adaptive capacity to the adverse impacts of Climate Change and increase resilience to environmental degradation; **and noting** the on-going cooperation between EU and AU through the GMES&Africa Initiative and through the intra-ACP Climate services and related applications programme;

Considérant aussi la déclaration finale du cinquième sommet UA-UE, tenu à Abidjan en novembre 2017, qui souligne comme faisant partie du deuxième domaine prioritaire de la Stratégie conjointe, la nécessité d'encourager l'utilisation des technologies et informations spatiales dans le contexte du renforcement de la capacité d'adaptation aux impacts négatifs du Changement Climatique et de la résilience à la dégradation de l'environnement; **et notant** la coopération en cours entre l'UE et l'UA par le biais de l'initiative GMES & Afrique et du programme intra-ACP pour les services climatologiques et les applications connexes;

Further considering, the WMO Space Programme, whose objective is to promote availability and utilization of satellite data and products for weather, climate, water and related applications to WMO Members, **and noting** that the WMO RA-I (Africa) Dissemination Expert Group (RAIDEG), the four African Centres of Excellence for Training and Education in Satellite Meteorology and its ASMET (African Satellite Meteorology Education and Training) are established African capacities in the area of satellite meteorology related to access to satellite data and products, as well as awareness and training;

Considérant en outre, le Programme spatial de l'OMM, dont l'objectif est de promouvoir la disponibilité et l'utilisation des données et produits satellitaires pour les applications météorologiques, climatologiques, hydrologiques et connexes vis-à-vis des Membres de l'OMM, et **notant que** le Groupe d'Expert RAIDEG du CR-I de l'OMM (Afrique), les quatre centres d'excellences africains de formation et d'éducation à la météorologie par satellite et son Programme d'éducation et de formation à la météorologie par satellite en Afrique (ASMET) sont des capacités africaines établies dans le domaine de la météorologie par satellite concernant l'accès aux données et produits satellitaires ainsi que la sensibilisation et la formation ;

Noting the key role of the RECs and Intergovernmental organisations in the dissemination at regional level of Earth observation techniques and in the strengthening of national capacities;

Notant le rôle clé des CERs et Organisations Intergouvernementales (OIG) dans la diffusion au niveau régional des techniques d'observation de la Terre et dans le renforcement des capacités nationales ;

Further considering the Memorandum of Understanding between the African Union Commission and EUMETSAT on general cooperation in the field of Earth observation that entered into force on 2 July 2018;

Considérant en outre le Protocole d'accord de coopération entre la Commission de l'Union Africaine et EUMETSAT dans le domaine de l'observation de la Terre, entré en vigueur le 2 juillet 2018;

Noting that the current Meteosat Second Generation (MSG) satellites provide since 2002, continuous weather and climate observations over the African continent and that several projects, funded by the European Development Funds (EDF) and implemented by the AUC with the support of the RECs over the last 15 years (PUMA, AMESD, MESA) have ensured that African national and regional institutions have free of charge direct access to and capacity to exploit data from MSG satellites;

Notant que les satellites actuels Meteosat de Seconde Génération (MSG) fournissent depuis 2002 des observations météorologiques et climatiques continues sur le continent africain et que plusieurs projets financés par les Fonds Européens de Développement (FED) et mis en œuvre par la CUA avec le soutien des CER au cours des 15 dernières années (PUMA, AMESD, MESA) ont veillé à ce que les institutions nationales et régionales africaines aient un accès gratuit et direct ainsi qu'une capacité à exploiter les données des satellites MSG;

Further noting that through the SAWIDRA continental project, implemented by ACMAD in cooperation with African space agencies, and funded by the African Development Bank (AfDB) as part of the Result #3 of the intra-ACP Building Disaster Resilience in Sub-Saharan Africa programmes, Africa will have direct access to polar orbiting meteorological satellites from NOAA, EUMETSAT and CMA to improve Numerical Weather Prediction;

Notant en outre que dans le cadre du projet continental SAWIDRA, mis en œuvre par l'ACMAD en coopération avec des agences spatiales africaines et financé par la Banque africaine de développement (BAD) dans le cadre du Résultat n°3 du programme intra-ACP de renforcement de la résilience face aux catastrophes en Afrique subsaharienne, l'Afrique aura un accès direct aux satellites météorologiques en orbite polaire de la NOAA, d'EUMETSAT et de la CMA pour améliorer la prévision numérique du temps ;

Emphasizing that the Meteosat Third Generation (MTG) satellites will be launched by EUMETSAT in 2021, replacing on the medium-term the MSG satellites, and providing more frequent and accurate observations of weather and climate over the African continent until 2040;

Soulignant que les satellites Meteosat Troisième Génération (MTG) seront lancés par EUMETSAT en 2021, remplaçant à moyen terme les satellites MSG et fournissant jusqu'en 2040 des observations plus fréquentes et plus précises de la situation météorologique et du climat sur le continent africain;

Convinced that

Convaincu que

- The joint and coordinated implementation of the Integrated African Strategy on Meteorology (Weather and Climate Services) and the Space Policy and Strategy will greatly contribute to the achievement of Agenda 2063 Vision of "an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in international arena",

- la mise en œuvre conjointe et coordonnée de la Stratégie africaine intégrée pour la météorologie (services météorologiques et climatologiques) et la Politique et Stratégie spatiales africaines contribuera grandement à l'Agenda 2063, qui est la vision d'une « Afrique intégrée, prospère et pacifique, dirigée et gérée par ses propres citoyens force dynamique dans l'arène internationale »,

- the delivery of weather and climate services is keystones for Africa's resilience and adaptive capacity to Climate Change, and for sustainable development in diversified but critical areas such as transport (aviation and maritime safety), agriculture, food security, disaster risk reduction, adaptation and resilience to climate change, and many other environment-sensitive situations;

- la fourniture des services météorologiques et climatologiques est la pierre angulaire de la résilience et de la capacité d'adaptation au changement climatique en Afrique et du développement durable dans des domaines divers mais critiques tels que les transports (aviation et sécurité maritime), l'agriculture, la sécurité alimentaire la prévention des risques de catastrophe, l'adaptation et la résilience au changement climatique et d'autres situations environnementales sensibles;

- space-based technologies and information play a crucial role in the monitoring of weather and climate and thus in the delivery of weather and climate services; and that current and future monitoring of any region in the world, including Africa, is achieved only thanks to international partnership with full and open data exchange principle and appropriate technology transfer;

- les technologies et les informations spatiales jouent un rôle crucial dans la surveillance des conditions météorologiques et du climat, et donc dans la fourniture de services météorologiques et climatologiques; et que le suivi actuel et futur de toute région du monde, y compris de l'Afrique, n'est possible que grâce au partenariat international avec un principe d'échange de données complet et ouvert;

- with the existing gap between providers and users, there is a need to establish User Interface mechanisms to serve as platforms for the systematic dialogue to co-design and co-develop effective and useful climate services that meet the needs and priorities of end users;

- compte tenu du fossé existant entre les fournisseurs et les utilisateurs, il est nécessaire de mettre en place des mécanismes d'interface utilisateur servant de plate-forme au dialogue systématique pour concevoir et développer conjointement des services climatologiques efficaces et utiles répondant aux besoins et aux priorités des utilisateurs

- Africa, while strengthening its human resources expertise and developing its own space capacities, can take advantage and benefit from existing or planned operational meteorological satellites that contribute to the global and continuous monitoring of weather and climate from both geostationary and polar orbits;

- l'Afrique, tout en renforçant son expertise en ressources humaines et en développant ses propres capacités spatiales, peut tirer profit des satellites météorologiques opérationnels en orbites géostationnaires et polaires existants ou prévus qui contribuent à la surveillance mondiale et continue du temps et du climat ;

- the Meteosat Third Generation (MTG) will provide a significant improvement of space-based monitoring of weather and climate over Africa for the next two decades, which will necessitate an increase and strengthening of existing capacities in Africa, at regional and national levels, to ensure access and exploitation of the MTG data;

- Meteosat Troisième Génération (MTG) apportera une amélioration significative de la surveillance spatiale des conditions météorologiques et climatiques en Afrique au cours des deux prochaines décennies, ce qui nécessitera une augmentation et un renforcement des capacités existantes en Afrique, aux niveaux régional et national, pour assurer l'accès et l'exploitation des données MTG;

- Continuous real-time access of space-based data is necessary through strengthening of multi-service dissemination systems, using satellite and terrestrial telecommunication infrastructure, to compensate for the narrow internet bandwidth; and

- un accès continu et en temps-réel aux données spatiales est nécessaire grâce au renforcement des systèmes de diffusion multiservices, utilisant les infrastructures de télécommunication satellitaires et terrestres, pour compenser une bande passante Internet souvent réduite ; et

- The development of African-tailored satellite products will be critical in responding to African requirements to support continental, regional and national decision-makers in implementing and monitoring policies in various sectors, such as agriculture, disaster risk reduction, water resources management, health, energy, transport (land, water and air), tourism, trade & commerce, including climate resilience and adaptation.

- le développement de produits satellitaires adaptés aux besoins de l'Afrique sera essentiel pour répondre aux exigences africaines visant à soutenir les décideurs continentaux, régionaux et nationaux dans la mise en œuvre et le suivi des politiques dans divers secteurs tels que l'agriculture, la prévention des risques de catastrophe, la gestion des ressources en eau, santé, énergie, transport (terrestre, fluvial/maritime et aérien), tourisme, commerce y compris la résilience et l'adaptation aux changements climatiques.

Solemnly agreed to:

- **Encourage and support** the strengthening of African capacities at regional and national levels, in particular in the National Meteorological and Hydrological Services, to ensure a smooth transition to MTG, and secure access to, and exploitation of MTG satellite data and products in support to the objectives of the Integrated African Strategy on Meteorology (Weather and Climate Services), and in line with the African Space Policy and Strategy;
- **Further strengthen** the African capacities in satellite meteorology by exploring the feasibility of developing and establishing, based on existing capacities, an African Meteorological Satellite Application Facility (AMSAF) leading to the generation of Africa-tailored satellite products on Weather and Climate Services answering to African requirements for socioeconomic development, capitalising on the main components of the WMO Space Programme and in line with the African Space Policy and Strategy;
- **Engage** with the European Union, within the framework of the Joint EU-Africa Strategy, to ensure that transition to MTG and the AMSAF are fully taken into account in the implementation of the joint Strategic Priority Area #2, which includes strengthening climate resilience in Africa, notably through fostering the use of space-based technologies and information;
- **Engage** with WMO and EUMETSAT to cooperate technically during the implementation of the points mentioned above;
- **Develop an action plan and constitute** a joint working group to monitor and facilitate the implementation of this Declaration;

Convenons solennellement de:

- **encourager et soutenir** le renforcement des capacités africaines aux niveaux régional et national, en particulier pour les services météorologiques et hydrologiques nationaux, pour assurer une transition en douceur vers MTG et sécuriser l'accès aux données et produits satellitaires MTG et leur exploitation pour atteindre les objectifs de la stratégie africaine intégrée de météorologie (services météorologiques et climatologiques), conformément à la politique et à la stratégie spatiales africaines;
- **renforcer** davantage les capacités africaines en météorologie par satellite en explorant la possibilité de développer et de mettre en place, sur la base des capacités existantes, une « Facilité Africaine pour les Applications des Satellites Météorologique » (AMSAF) permettant de générer des produits satellitaires pour les services météorologiques et climatiques adaptés aux besoins du continent africain pour son développement socio-économique basé sur les principales composantes du programme spatial de l'OMM et conformément à la politique et stratégie spatiales africaines;
- **coopérer avec** l'Union européenne, dans le cadre de la stratégie conjointe UA - UE, à veiller à ce que la transition vers MTG et AMSAF soit pleinement prise en compte dans la mise en œuvre du domaine de priorité stratégique n°2, notamment en encourageant l'utilisation de technologies et d'informations spatiales;
- **coopérer avec** l'OMM et EUMETSAT une coopération technique pour la mise en œuvre des points mentionnés ci-dessus;
- **développer un plan d'action et constituer** un groupe de travail commun chargé de suivre et de faciliter la mise en œuvre de cette déclaration et;

Kindly request:

- the Minister of Transport of the Republic of Côte d'Ivoire to bring the Abidjan Declaration to the attention of the AMCOMET and relevant African Union organs;
- the African Union Commission to draw the Abidjan Declaration to the attention of the international community and in particular to the European Union;
- the AMCOMET Bureau Chair to ensure that the content of this Declaration is used to update the Integrated African Strategy on Meteorology (Weather and Climate Services);

Invitons:

- le Ministre des transports de la République de Côte d'Ivoire à porter la Déclaration d'Abidjan à l'attention de l'AMCOMET et des organes compétents de l'Union Africaine;
- la Commission de l'Union africaine à porter la Déclaration d'Abidjan à l'attention de la communauté internationale et en particulier de l'Union Européenne;
- le Président du Bureau de l'AMCOMET à s'assurer que le contenu de cette déclaration soit utilisé pour mettre à jour la Stratégie Africaine Intégrée pour la météorologie (services météorologiques et climatologiques);

Done in Abidjan, Côte d'Ivoire, on Monday 24 September 2018, in 10 originals.

Fait à Abidjan, Côte d'Ivoire, le lundi 24 septembre 2018 en 10 copies originales.

For the African Union Commission
Pour le Commission de l'Union Africaine
H.E. Mrs Josefa Leonel Correia Sacko
Commissioner for Rural Economy and Agriculture

For the Republic of Côte d'Ivoire
Pour la République de Côte d'Ivoire
S.E. M. Amadou Koné
Ministre des Transports

For the AMCOMET
Pour l'AMCOMET
S.E. M. Gilberto Correia Carvalho Silva
AMCOMET Bureau Chair and Ministre de l'Agriculture et de l'environnement de la République du Cap-Vert

For the ECOWAS Commission
Pour la Commission de la CEDEAO
S.E. Sekou Sangaré
Commissaire chargé de l'agriculture, de l'environnement et des ressources en eaux

For the ECCAS Secretariat General
Pour le Secrétariat Général de la CEEAC
S.E. Madame Marie Thérèse Chantal Mfoula Edjomo
Secrétaire général adjoint en charge du Département de l'Intégration physique, Economique et Monétaires

For the IGAD Secretariat
Pour le Secrétariat de l'IGAD
on behalf of H.E. Amb. Eng. Mahboub Maalim
Executive Secretary

For the SADC Secretariat,
Pour le Secrétariat de la SADC,
H.E. Dr. Stergomena Lawrence Tax
Executive Secretary

PHOTOS

Signature Ceremony of the Abidjan Declaration

Opening Ceremony of the 13th UFA

13th UFA Group Photo