EUMETSAT

Report of the 15th EUMETSAT User Forum in Africa

13-16 September 2022

Dar es Salaam, United Republic of Tanzania

Monitoring weather and climate from space

REPORT OF THE 15TH EUMETSAT USER FORUM IN AFRICA

Organised by EUMETSAT in collaboration with the Tanzanian Meteorological Authority (TMA), under the Ministry of Works and Transports of the United Republic of Tanzania.

Julius Nyerere International Conference Center
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INTRODUCTION

The 15th EUMETSAT User Forum in Africa was organised in Dar es Salaam, United Republic of Tanzania, in collaboration with the Tanzanian Meteorological Authority, under the Ministry of Works and Transports of the United Republic of Tanzania.

The Forum was held from 13 to 16 September 2022 with some 150 participants representing 60 countries, of which 51 were African. This event also comprises Technical sessions organised online prior the Forum the 08th and 09th of June 2022.

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 satellite data throughout the continent, in support to sustainable development.

The programme of the Plenary sessions of the 15th EUMETSAT User Forum in Africa included an Opening Ceremony, seven plenary 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 the seventeen recommendations included in this report.

PARTICIPANTS

The Plenary sessions of 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 Works and Transports, several Tanzanian institutions were also represented such as the Tanzania Fisheries Research Institute and the Tanzania Forest Services Agency.

Finally, representatives of various European and International institutions also took part of the Forum. This includes representatives from the European Commission, European meteorological services and the World Meteorological Organization (WMO). Research institutions from Africa and Europe were also present.

The list of all participants of the Plenary sessions of the Forum is provided in Annex.

OVERVIEW OF THE FORUM

During the Opening Ceremony of the 15th EUMETSAT User Forum in Africa, representatives of the Dar es Salaam Regional Commission, the Tanzania Meteorological Authority, the EUMETSAT, the World Meteorological Organization, the African Union Commission, the Southern African Development Community, the EU Delegation to the United Republic of Tanzania, and the Minister of Works and Transport of the United Republic of Tanzania delivered welcome remarks and 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 revised Integrated African Strategy on Meteorology (Weather and Climate Services) and the African Space Policy and Strategy. These two, together with the Joint EU-Africa Strategy, constitute the main policy framework for EUMETSAT cooperation with Africa.

The Plenary sessions allowed participants to get information, discuss and provide feedback on EUMETSAT programmes, data access (inc. PUMA 2015 stations) and training activities. A session was specifically dedicated to the Meteosat Third Generation and another one to Climate services. Furthermore, the programme included specific sessions dedicated to the use of Earth observations for Blue Economy and Disaster Risk Reduction. These sessions also included presentations giving information about the status of implementation and results on the African Capacity Building Programme projects funded by European Funds such as the Intra-ACP ClimSA, SAWIDRA and GMES&Africa projects.

This report includes a summary of all sessions and presentations. All presentations and speeches delivered during the Plenary sessions of the 15th EUMETSAT User Forum in Africa are included on the Forum website (https://ufa.eumetsat.int/).

The Tanzanian Meteorological Authority organised a technical tour. This well-attended excursion included a visit to the new Tanzanian Standard Gauge Railway System with visits to the Dar es Salaam New Central and to the Pugu Stations.

Dar es Saalam High level event

A High-level event on the Meteosat Third Generation for Africa and the African Meteorological Satellite Application Facility took place on the 12th September afternoon at the eve of the Forum. This event was hosted by Hon. Atupele Fredy Mwakibete Deputy Minister of Works and Transport of the United Republic of Tanzania, with the participation of the Hon. Jean Ernest Masséna Ngallè Bibéhè, President of the AMCOMET Bureau and Minister of Transport of the Republic of Cameroon and a Representative of the Department of Agriculture, Rural Development, Blue Economy, and Sustainable Environment of the African Union Commission and representatives

of the SADC, IGAD, ACMAD, WMO, EU and EUMETSAT. This Statement was presented and at the end of the event, the Deputy Minister of Work and Transports, the President of the AMCOMET Bureau and the AUC endorsed the Dar es Salaam High-Level Statement and signed on by the Deputy Minister and AMCOMET President and later by the African Union Commissioner for Agriculture, Rural Development, Blue Economy, and Sustainable Environment.

A copy of the High-Level Statement is annexed to this report.

The African Space Art Project (ASAP)

On Monday 12th September, the African Artists for Development and EUMETSAT presented the Artwork produced by the African Artists of the N.E.T collective (Jean David Nkot, Michel Ekeba and Géraldine Tobe) that have been selected and supported by the African Space Art Project (ASAP).

The African Space Art Project programme (ASAP) has been conceived in 2017 by the French NGO African Artists for Development (AAD-Fund) in partnership with EUMETSAT and Arianespace. Together, they have decided to cover Ariane 5 with the image of a piece of art created by an African Contemporary Artist to celebrate the launch of the Meteosat Third Generation satellite which will contribute to meteorological observation of the African continent.

The Artwork, *Memory of today, Memory of the future*, is a monumental canvas that evokes the Africa of yesterday and today committed to a common future. With the collective N.E.T, it is the whole continent that is projected in this canvas.This work reminds us how much the earth and space are in fusion and live together.

Memory of today, Memory of the future by the N.E.T collective

Online Technical sessions

The Forum has been preceded by Technical sessions organised the 8th and 9th June 2022 online. These sessions consisted of one Introductory session, and 3 Technical Sessions on #1 Data access and training, #2 Meteosat Third Generation in Africa with a focus on the new PUMA-202X-MTG stations and #3 Climate monitoring and services (including ClimSA programme activities) with a focus on the new Climate Stations. These sessions allowed experts from African NMHS and Regional Centres to exchange on these topics. All sessions were organised around one to three keynote presentation(s) in plenary and in a splinter group session (4 to 6 groups based on Topics and or by African Region). More than 120 Experts participated for these 2 days sessions. The main outcomes of each technical session have been presented during the Plenary session and are part of this report incorporated in each thematic plenary session .

The Plenary Sessions

The full programme of the Forum (Plenary and Online Technical sessions) is presented in Annex.

MAIN OUTCOMES

The main outcomes of the Forum are:

- The Forum discussed the status of implementation of the **Roadmap for the transition from MSG to MTG in Africa** endorsed during the 13th EUFA and supported politically through the Abidjan Declaration and recalled through the Dar-es-Salaam High-Level Statement. It recommended that discussions continue:
    - To support the AUC, the RCCs and the NMHSs in order to ensure deployment of the upcoming MTG-ready PUMA (EUMETCast reception) station by 2023-2024 timeframe within the framework of the EU funded Intra-ACP ClimSA programme
    - With the AUC, RCCs and the NMHSs to ensure that a sufficient number of NMHSs staffs are trained in the coming years on the new PUMA stations and on the applications of the MTG instruments,

- The Forum discussed the way forward for the **establishment of the AMSAF**. It recommended that work continues wiith the Abidjan Declaration Joint Working Group and the RAIDEG to discuss a roadmap for establishing the AMSAF.

- The Forum discussed and provided recommendations in order to improve **Climate services and Nowcasting** in NMHSs;

- The Forum provided comments on three continental projects (SAWIDRA, GMES&Africa and intra-ACP ClimSA) and recommended ways **to ensure sustainability, cross-fertilization among programmes in order to enhance impact and appropriation of these projects at national level**;

- Finally, the Forum, supported by report from the RAIDEG, discussed **data access and training needs** to support the exploitation of satellite data for various applications in Africa.

The main recommendations are listed in the next section. They are related either to EUMETSAT data access and training activities, to the transition to MTG and the AMSAF, to thematic activities related to Blue economy, Climate monitoring and services, Nowcasting and early warning and aviation, to Capacity building programmes in Africa or more broadly to continental approach to foster Space and Earth observation.

LIST OF RECOMMENDATIONS

Arranged as follows:

- Transition to MTG and AMSAF- recommendations #1 to #5
- Satellite data for early warning and aviation – recommendations #6 to #9
- Satellite data for Blue Economy – recommendations #10 to #13
- Satellite data for Climate monitoring and services – recommendations #14 and #15
- Data access and Training – recommendations #16 and #17

Transition to MTG and AMSAF

#1 Dar es Salaam Statement

The Forum took note of the Dar es Salaam Statement on MTG for Africa and AMSAF. Participants fully supported this statement, and emphasized the strong added value of the new MTG instruments, in particular the Lightning Imager (LI) and Flexible Combined Imager (FCI) for Africa. The Forum kindly asked the AMCOMET Chair and Secretariat to bring this Statement to the attention of the AMCOMET and to all African countries.

#2 New reception stations for MTG (PUMA-202X stations)

The Forum thanked the AUC and the EU for planning ClimSA funds for the procurement of new PUMA-202X-MTG stations that will replace the existing ones, which were deployed in 2016. The new stations should provide capacity to access, process and visualise the MTG-Africa products made available through EUMETCast-Africa.

The Forum recommended to AUC to expedite the launch of the procurement process, so that new PUMA stations can be deployed in all sub-Saharan Africa NMHS before the end of 2024.

#3 New reception stations for North Africa

The Forum also recommends to EUMETSAT to support North Africa countries in the transition to MTG by providing technical specification for the different EUMETCast broadcast band (C-Band and Ku-Band) and supporting regional Vlab Centers of Excellence to deliver training on MTG FCI, LI and sounder instruments. It recommends EUMETSAT and North Africa NMHSs to hold a dedicated meeting after the launch of MTG to discuss their preparedness for MTG.

#4 Training

The Forum took note of the training sessions that are planned on the new PUMA-202x station (system administrator and applications) as part of the ClimSA programme, as well as the MTG-related training topic planned to be addressed by WMO Vlab CoE, as part of the African Satellite Meteorology Training (ASMET) programme on various topic such as atmospheric convection, cloud identification, precipitation products, lightning, etc.

The Forum recommends to AUC and EUMETSAT to ensure that a sufficient number of forecasters and IT specialists are trained in the coming years on the new PUMA stations and on the applications of the MTG instruments (FCI and LI), in order to ensure a fast ramp-up of African capacities for MTG and sustainability through a critical mass of trained staff.

#5 – African Meteorological Satellite Application Facility

The Forum noted the concept for MTG AMSAF programme and fully supported it. It noted that the installation of NWC SAF locally in Africa, and of the Drought & Vegetation Data Cube, could become precursors of such an AMSAF.

It recommends to the Abidjan Declaration Joint Working Group and the RAIDEG to further discuss a roadmap for establishing the AMSAF, through concrete step-by-step implementation including a strong capacity development component, an adequate training strategy, and technology transfer to allow a quick operationalisation of AMSAF.

Satellite data for early warning and aviation

#6 - Nowcasting . Turbulence

In view of its importance for aviation, the Forum recommends to RAIDEG to assess with EUMETSAT the possibility to include the NWC SAF Turbulence products in the EUMETCast Africa dissemination in addition to the other products.

#7 - Nowcasting SAF installation in Africa

The Forum noted that several regional centres and NMHSs have successfully installed and operated the NWC SAF software in recent years, notably thanks to the SWIFT-Africa project. It also noted the case of Southern Africa, where the Regional Specialised Meteorological Centre run the NWC SAF and make available NWC products in the Southern Africa region.

The Forum recommended the other regions to assess the implementation of similar scheme. It noted in particular the interest of CAPC-AC and the Central Africa NMHS

for the NWC SAF products, and recommends CAPC-AC and NMHS to continue discussion to install a regional NWC SAF seconded by National ones.

#8 - SAWIDRA – RARS Africa

The Forum recommended to ACMAD, in close cooperation with the four RARS Africa antenna hosting sites (SAWS & SANSA, AGEOS, ICPAC, AGRHYMET), to operationalise the RARS Africa network and put data in the GTS, so that all NMHSs and international partners can benefit from this infrastructure. The Forum also recommends ACMAD to operate a NWP regional model at similar resolution (or better) than global model.

#9 - Disaster Situation Room

The Forum recommended to the regional entities working in the area of disaster risk reduction, and running Disaster Situation Rooms to continue close collaboration with the national meteorological services and other national agencies and regional institutions working in this arena. The Forum noted that the mandate to raise warning for weather and climate related disaster is at national level.

In line with the 2022 Maputo Ministerial Declaration on “Bridging the Gap between Early Warning and Early Action”, the Forum also noted that MTG and AMSAF will be essential to feed MHEWS and Disaster Situation Room at continental, regional and national level. The Forum recommended to all NMHS to plan to include MTG, NWC SAF, Hydrology SAF and AMSAF derived products in their input to disaster early warning system at national level.

Satellite data for Blue Economy

#10 - G&A and Meteorological community

Inspired by the example of University of Ghana and Ghana Met cooperation, the Forum noted that Synergy between NMHS and GMES & Africa consortia could be greatly beneficial to strengthen EO-based services to citizens in Africa.

The Forum recommends that AUC (GMES & Africa and ClimSA) and AMCOMET secretariat, with the support from EUMETSAT, ESA and JRC, to define concrete engagement areas, where actual cooperation could be beneficial for the citizens, based on the existing GMES & Africa phase 2 services and NMHS. At least, one successful NMHS-G&A cooperation to be demonstrated per each region at the next GMES & Africa Service Workshops and Forum, and EUMETSAT User Forum in Africa, to serve as “best practices” inspiring others.

#11 - G&A and NMHS cooperation in Western and Northern Africa for Coastal & Marine services

The Forum noted that UoG call to the NMHS in Western and Northern Africa to engage with each other, and discuss possible cooperation. The Forum recommends UoG and NMHS to engage discussion on implementing services to fishermen, while taking into account respective national mandate in the area of marine weather forecast and marine & coastal resources management.

#12 - Use of EO by River Basin Authority

The Forum noted that River Basin Authorities are making extensive use of satellite data. In particular, Meteosat data are used for some critical operations (like flood warning and water management). The Forum recommended to the River Basin Authorities to consider transition to MTG as soon as possible to be ready and benefit increase accuracy for their services.

#13 - G&A Marine in Southern Africa and Indian Ocean

The Forum noted the excellent products made available by the G&A MarcoSIO consortia for Southern Africa and Indian Ocean (e.g. CSIR and TAFIRI). It recommended to the consortia to plan sufficient efforts to engage with users, policy and decision makers in all countries covered by their products, through awareness rising and training activities.

Satellite data for Climate monitoring and services

#14 - Satellite-based climate data for Africa and Climate station

The Forum noted a need for awareness raising and capacity building among potential users in Africa for satellite-based climate products and tools demonstrated (TAMSAT EUMETSAT Data Cube, CM SAF products and toolbox, JRC Climate station). The Forum called upon closer collaboration between African and European institutions (data/tool providers) to optimize utilization of available data/tools to improve climate services in Africa. Strengthened collaboration between the Africa institutions are also encouraged to increase skill/technology exchange.

The Forum recommended to ClimSA partners, to EUMETSAT, to JRC, to TAMSAT and to CM SAF, to strengthen training on these tools and products.

The Forum also recommends CLimSA partners to consider the maintenance of the existing MESA stations to ensure continuous reception and operation, in parallel to the Climate station.

Finally, the Forum recommends to AUC to assess under which modalities North Africa countries could also benefit from the Climate station.

#15 – Satellite based climate data on Cloud

The Forum also recommended to ClimSA, AUC and EUMETSAT to assess the possibility to make available these products (TAMSAT, EUMETSAT Data Cube, CM SAF products and toolbox) on a cloud service, such as the European Weather Cloud, or on an African Cloud service that could be established as part of the AMSAF.

Data access and Training

#16 – Pytroll for RARS and others

The Forum noted with interest the availability of the Pytroll open source python software modules built to read, process and visualise EO satellites and the opportunity for the RARS Africa Hosting Sites to use these modules. The Forum recommended the RARS Hosting Sites and partners (AGRHYMET, ICAPC, AGEOS, SANSA, SAWS and ACMAD) to engage with Pytroll in order to install and use the software for the exploitation of the data received from the Polar orbiting Meteorological Satellites through the RARS Station.

The Forum also encouraged the NMHS with good IT and Python coding knowledge to assess the possibility to install, test and run the Pytroll in their premises, as a parallel system to the PUMA station.

#17 – NMHS and NREN

The Forum welcomed the AfricaConnect3 initiative proposal to engage more with the meteorological and climate community. NRENs might indeed play a significant role in facilitating data exchange (satellite, model, others) especially when it comes to voluminous data sets (Big Data).

The Forum further noted that the EUMETCAST terrestrial (which can be based on NREN network) will allow access to all MTG data & products (contrary to EUMETCast-Africa). The Forum recommended to NMHSs and RCCs that are willing to adopt these technologies to contact their respective NREN and inform EUMETSAT and AfricaConnect, so that test connections can be prepared and performed. NMHS and other partners are also encouraged to stay engage with NRENs and express their needs in terms of connectivity, access, data dissemination and other services.

PLENARY SESSIONS REPORT

SESSION 1 – INTRODUCTORY SESSION

Chairperson: Agnes L. Kijazi, TMA
Co-rapporteurs: Wilbert Muruke, TMA and Vincent Gabaglio, EUMETSAT

1. Session purpose and Content

Following the Opening ceremony, this introductory session set the scene for this Forum with a focus on the Key African policies and strategies related to Space, Meteorology and on the cooperation between the AU and the EU. This session also informed the audience about the status of the various EUMETSAT programmes and activities: MSG, EPS, Jason, MTG, EPS-SG, SAFs.

2. Session contributions

African Space Policy (inc. GMES&Africa), Tidiane Ouattara (AUC-ESTI)

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 highlighted within his presentation the main outcomes of the first phase of the GMES&Africa Support Programme (2017-2021): The services implemented (8 Marine and Coastal services, and 11 Water and land services) involving 122 African institutions. Furthermore, GMES&Africa developed and performed more than 67 different training courses for more than 2,630 trainees. The 2nd phase of the GMES&Africa (2022-25) is build mostly on the same approach than during the first phase. Among the specificities of this 2nd phase a focus on women and youth will be highlighted.

Revised Integrated African Strategy on Meteorology (Weather and Climate Services), Jolly Wasambo, (AUC-DARBE)

Jolly gave to the participants an overview on the revised Integrated African Strategy on Meteorology (Weather and Climate Services) that has been endorsed during the AMCOMET-5 in March 2021 and adopted by the African Union Assembly (Decision: Assembly/AU/Dec. 819(XXXV)). This strategy is declined in five strategic pillars ((i) Policy (including gender) (ii) Observation networks, data access and processing, (iii) Services (weather, water, climate; and early warning systems), (iv) Research, innovation, development & training and (v) Partnerships). The revision of this Strategy has been done possible through Regional Consultations with Validation & Adoption by Member States.

EUMETSAT programme, Paul Counet (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. Paul detailed the role of EUMETSAT in the Copernicus program, which includes the operation of Sentinels-3, 4 and 5 in support to marine, atmosphere as well as climate services. Then, he focused his presentation on the new generation of satellite: the Meteosat Third Generation and the EUMETSAT Polar System - Second Generation (EPS-SG) and explaining the status of their respective development. Paul in formed the audience that the first MTG imager is scheduled to be launched on the 14th of December 2022. MTG satellites constellation are expected to be on operation as of 2024 and until 2040.

JRC contributions to enabling Earth Observation Services for decision-making in Africa, Ivan Kulis (European Commission, Joint Research Center)

Ivan Kulis through a video presentation, gave an overview of the JRC activities in Africa linked to Earth Observation. He recalled first the long cooperation history between EUMETSAT and JRC for EO in Africa starting from EU funded PUMA project in the early 2000's, until on-going GMES&Africa and ClimSA programme. Then, Ivan described how JRC is working on cross-cutting knowledge management for development policy and on how in this context to integrate EO and other datasets on knowledge platform such as the African Knowledge Platform[1] and the EU Knowledge Centre on Earth Observation[2]. This, in support to EU policies such as the Green Deal and the Digital Strategy. The recently launched African Knowledge Platform aims at offering an entry point for all JRC scientific actions and collaborations with a particular focus on Africa. Finally, Ivan outlined some of the lessons learnt such as the need for co-design services, the need to establish sustainable services and the need to identify social and economic governance framework as well as the Technical and Information governance framework in order to sustain service provision in the future.

[1] https://africa-knowledge-platform.ec.europa.eu/
[2] https://knowledge4policy.ec.europa.eu/earthobservation_en

SESSION 2 – METEOSAT THIRD GENERATION IN AFRICA AND AMSAF

Chairperson: Paul Elvis Tangem, AUC-DARBE
Rapporteurs: M. Diop Kane, AMCOMET/WMO and H. Trebossen, EUMETSAT

1. Session purpose and Content

The second session focused on the implementation of the Abidjan Declaration: the transition in Africa towards the Meteosat Third Generation (MTG) satellites and the African Meteorological Satellite Application Facility (AMSAF).

As the successor of the current Meteosat Second Generation (MSG), Meteosat Third Generation (MTG) will provide observation over the entire African continent on a continuous and frequent basis (every 10 minutes) for the next two decades. MTG will also substantially increase the observation spectrum providing 20 times more real-time information on fast developing high-impact weather and ocean and surface parameters such as sea surface temperature, turbidity of coastal waters, wildfires and incoming solar energy.

This session informed the audience about the new capabilities of MTG, the upgrade of the PUMA stations and related training activities. Then, the concept of the African Meteorological Satellite Application Facility is presented and discussed with the participants.

2. Session contributions

Meteosat Third Generation (MTG) programme, Katja Hungershoefer (EUMETSAT)

Katja started with an overview of the MTG programme and the instruments aboard MTG-I satellites. Then, she presented the baseline for the MTG-I products to be disseminated via EUMETCast Africa. This baseline was defined by RAIDEG experts and EUMETSAT over the last years and includes customised FCI Level L1c data, RGB images, FCI Level 2 products as well as products from the H SAF and L SAF. In addition, three products generated with the NWC SAF software will be generated by EUMETSAT and disseminated via EUMETCast Africa. The Lightning Imager (LI) Accumulated Flash Area product is disseminated to providing the African users the location and spatial extension of lightning flashes. During the MTG-I-1 commissioning phase (2023), the product sizes and timeliness will be measured based on real data. The outcomes and possible adjustments will be shared and discussed within the RAIDEG team.

Main benefits of MTG for Africa, Sarah Kimani (RAIDEG)

Sarah outlined in her presentation that the LI, the new channels with the high spatial resolution (2km) and temporal resolution (10 minutes) will tremendously improve NWP, nowcasting and subsequent applications for various socio-economic sectors.

The benefits of MSG data were pointed out as being extremely reliable, very versatile in various application areas, MSG data was an exponential enhancement from Meteosat 1st Generation of satellites in the product offering, the availability and accessibility of data has developed relationships and collaborative work between organizations and it has also allowed for innovation in multiple ways in which to visualize data.

She also presented the results of a the MASEIS Study on the potential socio-economic impact of MTG satellite in Africa in 3 socioeconomic sectors, including Agriculture, DRR, and Air Navigation for 10 potential services. The MASEIS showed benefits of 3 times even 4 times than with MSG.

However, MTG will come with lot of infrastructure and human resources constraints that need to be addressed for Africa to fully benefit from MTG.

Transition 2023-2025: Overview, Vincent Gabaglio (EUMETSAT)

Vincent Gabaglio presented the various elements to be taken into account for the transition period from MSG to MTG. He listed the main milestones for African NMHS to be ready for MTG when it will take over the primary Full Disk Scan service at 0 degree longitude in the 2025-26 timeframe. Then he introduced the two presentations on the upgrade of the PUMA stations and on the training.

Data access: Upgrade of the PUMA stations, Jolly Wassambo (AUC)

Jolly presented the plan for the upgrade of the PUMA stations and climate stations that will be deployed within the CLIMSA project. He first recalled that previous PUMA-2015 stations were deployed under the EU-funded MESA programme in 2016-2017, the warranty on this infrastructure expired in 2020 and therefore the PUMA-2015 Stations are ageing. He detailed the procurement and deployment of the infrastructure as well as the expected responsibilities.

MTG-Africa: Overview of Training activities, Vesa Nietosvaara (EUMETSAT)

Vesa introduced the set of training that will be implemented during the MTG era. The objectives of these trainings will be to help the operational meteorologists and other users in being ready for MTG new capabilities and to help the users in being proficient users of new products. Training needs are identified by the VLab CoE and comprise a broad range of thematic such as training on PUMA maintenance, RGB products interpretation, Climate, Fire monitoring among other themes. Then, Vesa described the current discussions that are occurring with the RAIDEG expert group. At last Vesa encouraged the NMHSs to contact the Training centres or their RAIDEG regional focal point to communicate their training needs.

Report of Technical Sessions Meteosat Third Generation, Jolly Wasambo (AUC)

Jolly presented briefly the results of the Online Technical Session dedicated to Meteosat Third Generation that was organised online the 8th June 2022 as a preamble of the Forum. The objective of the session was to introduce MTG, address the challenges related to the transition to MTG in Africa, interact with the participants on the upgrade of PUMA-2015 stations. This interactive session was composed of 2 presentations (one on MTG and one on the Transition Roadmap) and 5 Working Groups including 2 WGs dedicated to the Transition Roadmap, 2 WGs dedicated to the MTG New instruments (LI and FCI) and 1 WG focused on North Africa because of the specific transition scenario for the region. This session resulted in a set of recommendations that includes that NMHS experts shall get more familiar with the new MTG products, important training efforts are needed on the administration of the PUMA 202X stations, on alternative data access mechanism as well as on the exploitation of the new products in Nowcasting activities.

Proposal for a MTG-AMSAF programme, Mariane Diop Kane (AMCOMET/WMO, Secretariat of the Abidjan Declaration JWG)

Mariane put in context the MTG-AMSAF programme. She reminded the benefits MTG will offer in improving NWP, nowcasting and the production of weather and climate services, and the infrastructure and human resources challenges Africa may face. This was well captured in the Abidjan declaration, which further requested an establishment of a Joint Working Group to ensure a smooth transition from MSG to MTG, and reliable products available to users.

She informed that the group was established, following the approval of the declaration by AUC organs. The JWG is composed of RECs with their Regional Centers, AUC is the Chair, AMCOMET-Secretariat and EUMETSAT are the co-secretariat. The MTG-AMSAF has been thereafter developed. It is thought to be a successor of PUMA, AMESD, MESA and ClimSA projects, with a stronger component on training, research and development, and strengthened policy frameworks and knowledge sharing is shared across the continent. The RECs have prioritize their areas for products and services to developed. Hence the MTG-AMSAF will include eight thematic areas: Transport, Agriculture, Environment, Energy, Blue Economy, Desertification, DRR and Health.

She also indicated that the concept has been presented at many high level fora for awareness raising and as part of the resource mobilization efforts of the JWG.

3. Discussions and Recommendations

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

- Discussions occurred on the baseline agreed among RAIDEG experts. It has been recommended for a gradual increase of the datasets and to RAIDEG to continue to work with EUMETSAT and all stakeholders to ensure needs of users are captured;

- Regarding the AMSAF, it has been discussed about the work done by the Joint Working Group. It has been recommended to the JWG to continue their efforts under the leadership of AUC to mobilise resources to fund the MTG-AMSAF. It has been also recommend to the JWG to ensure that the MTG-AMSAF include a strong capacity development component, an adequate training strategy, and technology transfer to allow a quick operationalisation of AMSAF(s);

- Discussions also took place on the training program, in particular the training topics that will be covered during the MTG transition phase and notably the training for the maintenance and use of the future PUMA 202X stations.

Session 2 contributed to recommendations **#1** to **#5**

SESSION 3 - EARLY WARNING FOR EARLY ACTION

Chairperson: Dr Pascal Waniha, TMA
Rapporteurs: Leon Razafindrakoto (ACMAD) and Sally Wannop (EUMETSAT)

1. Session purpose and Content

The third session focused on Disaster Risk Reduction. It engaged more specifically on Nowcasting and Numerical Weather Prediction for Early Warning System and Disaster Situation Room. Discussion included activities at regional or national level, and ways to ease cooperation between the NMHS and the disaster management authorities.

2. Session contributions

DRR and MHEWS in Africa, Africa Multi-Hazard Early Warning and Action System for DRR Situation Room, Lusajo Ambukege (AUC-DARBE)

Lusajo focused his presentation on the African Strategy for Disaster Risk Reduction and the Programme of Action for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa. The presentation provided highlights of the Africa Multi- Hazard Early Warning and Early Action System for Disaster Risk Reduction Situation Room and other frameworks initiatives that aimed at developing EWS and advancing DRR on the continent. Finally, the presentation provided an overview of the Situation room taht has been installed at AUC, ACMAD and IGAD/ICPAC premises. These equipments have the objectives to increase the availability and access of early warning information to the African public to reduce disaster losses.

SAWIDRA and NWP in Africa, Leon Razafindrakoto (ACMAD)

Africa is one of the two regions (with the Pacific), which is not covered by the WMO Regional Advanced Retransmission Service (RARS) network. When considering the contribution of polar orbiting satellite data to the global and regional Numerical Weather Prediction models, this gap has an impact for various applications, such as Disaster Risk Reduction (early warning system). Leon's presentation gave a brief summary of the overall RARS-Africa network status and the challenges faced by ACMAD and its partners in Africa (mainly hosting sites and the regional centres) after the RARS-Africa network implementation in 2017-2020 within the SAWIDRA project.

Nowcasting SAF, products and use in Africa, Xavier Calbet (AEMET, NWC SAF)

Xavier, in his presentation, detailed the activities of the Nowcasting-SAF. The NWC-SAF develops software packages for geostationary and polar-orbiting satellites to support users making nowcasting in near real-time locally. These products provide a quick interpretation and analysis of the current weather situation as well as some extrapolation techniques for Nowcasting. Some of the products, such as Atmospheric

Motion Vectors (AMVs), are routinely assimilated into regional Numerical Weather Prediction (NWP) models. The presentation discussed on the future of these software and products in Africa.

RSMC NWC regional approach, Nico Kroese (SAWS)

The South African Weather Service (SAWS) is the National Meteorological Centre of South Africa with the mandate to provide weather and climate information, products, services, and solutions that contribute to the safety of life and property in the air, land and sea over South Africa and adjacent oceans. Additionally, SAWS is also a World Meteorological Organization (WMO) Regional Specialised Meteorological Centres (RSMC) and the lead RSMC for the WMO Severe Weather Forecasting Programme (SWFP) for southern Africa. Part of the responsibility of SAWS as lead RSMC for SWFP southern Africa is the provision of products and services to the SADC region to assist National Meteorological and Hydrological Services amongst others with the provision of nowcasting services. In his presentation, Nico outlined the current approach SAWS uses to assist the region in their nowcasting activities and the future plans envisaged.

Situation room at ICPAC, Viola Otieno (ICPAC)

Viola's presentation provided an overview of the newly established IGAD Disaster Operation Centre (IDOC). One of the core functions of the Disaster Operation Centre is the establishment of multi-hazard early warning systems to support early action and DRR initiatives in general. ICPAC has developed several early warning systems utilizing satellite-data and in this short presentation highlights the role of the IDOC in Disaster Risk Reduction efforts in the region and the satellite-based early warning systems developed with a special focus on Desert Locust Early Warning System.

Delivering nowcasting to users in Ghana, Maureen Abla Ahiataku (GMet)

In her presentation, Maureen gave an overview of Ghana's (GMet) approach to nowcasting for disaster risk reduction thus early warning for early action and evaluation of the Rapid Developing thunderstorms products of Nowcasting Satellite Application Facilities (NWC SAF) performance on high impact weather events. In line with this, results on how user communities use the weather information for preparedness during high impact weather will be accessed.

Early warning for disaster risk reduction, Emad Moselhi (EMA)

Emad described a DRR Early Warning System case study that occurred in March 2020. On these days, Egypt and Middle East witnessed one of the most instability cases in weather. All governorates were exposed to torrential rains, thunder storms, flash floods and dust storms. This event was forecasted and monitored by EMA. As the strength of the event continued to increase, it was decided to issue a warning for the

case 72 hours before it started. The warning was sent to the information and decision support center in the Council of Ministers, which is responsible to coordinate the actions that will be taken to face the case of instability: warning was published to the public, EMA and the Cabinet Chamber held a press conference led by the Prime Minister to highlight the strength of the situation. All governorates were alerted to prepare the response to the event.

Active Fire Monitoring in Tanzania, Kekilia Kanalimu (TFS)

Kekilia outlined the role of Earth Observation in the active fire monitoring in Tanzania. She notably detailed the activities undertaken during EU funded MESA project at the Tanzania Forest Services Agency with the use of Near Real Time EO products received through EUMETCast via the MESA Station installed at TFS premises. She also explained how the wildfire detected are reported to field staff for fire combating. Then, Kekilia detailed the wildfire distribution in Tanzania from 2019 to 2022 and the measures taken in place to strengthen local capacities to fight against fire.

3. Discussions and Recommendations

Following the presentations, the following points were raised :

- It has been recalled that the issuance of warnings is the main task of national meteorological services. Regional institutions are in support to NMHSs in the areas of training and support to disaster risk reduction;

- Entities which are running Disaster Situation Rooms should continue to collaborate with the national meteorological services and other national agencies and regional institutions working in this arena;

- Support and training are needed for the use of the NWC-SAF products and software are needed by the NMHSs. In addition, local support for assess NWC-SAF products;

- ASECNA commented that the products which contain turbulence information are important for aviation, and could these be considered for inclusion in EUMETCast Africa baseline;

- There is a need to operationalise the RARS Africa network and to put data in the GTS, so that all NMHSs and international partners can benefit from this infrastructure;

- Resolution of regional models that need to be at the same resolution than global model.

Session 3 contributed to recommendations **#6** to **#9.**

SESSION 4 - BLUE ECONOMY

Chairperson: Linda Amornghor-Oje Etta, AUC-DARBE
Rapporteurs: Meshack Ndiritu, AUC-ESTI and Hervé Trebossen, EUMETSAT

1. Session purpose and Content

This fourth session focused on Blue Economy. It addressed satellite applications for Marine, Great Lake and Rivers, focusing on the access and use of data and products of the Copernicus and EUMETSAT data as well as applications for fisheries, transport, water management and safety at sea.

2. Session contributions

Blue Economy Strategy, Linda Amornghor-Oje Etta (AUC)

Linda presented the Blue Economy Strategy for Africa which is coordinated by the African Union Commission. The Blue Economy covers not only the oceans, but also the inland waters, in which sense all Member States of the African Union are carried along. Linda recalled that 38 out of AU's 55 Member States are coastal countries. The aim of the Blue Economy strategy is to protect the ocean. The pillars of the strategy are: (i) Fishing, transportation, trade, ports, maritime security, safety, (ii) Climate-proof and building resilience for coastal communities and ecosystem, (iii) Sustainable energy and mineral resources and innovative industries and (iv) Strengthening institutional framework and capacities. The core principles of the department is to build sustainability, inclusivity and impact. To do so, there is need for accurate and timely data, and space is of importance. In the same sense, there is need for establishing synergies with marine meteorology institutions, EO programmes, etc. Synergies have already started with the EU funded GMES & Africa and ClimSA projects.

EUMETSAT products for blue economy, Sally Wannop (EUMETSAT)

Sally presented first the satellites that are operated by EUMETSAT and the products disseminated. Applications and services based on these products have huge societal impacts including measuring water quality, monitoring algal blooms, etc.. Data provides long-term baselines for environmental management. For instance EO support the estimation of coastal and inland water quality that provide tools for operational planning of the aquaculture activities. There are several case studies libraries on the EUMETSAT website. Then, Sally introduced some examples from the EUMETSAT Case Study Library such as the monitoring of marine heatwaves. In terms of data access, EUMETSAT provides a range of data access mechanisms from EUMETCast Africa to Cloud solutions as well as EUMETCast terrestrial.

EO support for GMES & Africa's Marine and Coastal Operations for Southern Africa and the Indian Ocean, Lufuno Vhengani (CSIR)

Lufuno presented on the MarcoSIO project which is funded by GMES & Africa Phase 2. The MarcoSIO project, previously known as MarcoSouth project during GMES & Africa Phase 1 intends to implement 6 services (I) fisheries service that provides weather forecasts to fishermen via mobile applications, (ii) aquaculture service based upon Sentinel-3 marine data, (iii) coral bleaching, (iv) coastal ecosystems, (v) ship traffic monitoring service using AIS and Sentinel-1 and (vi) sea rescue. EO and geophysical model data are invaluable to the success of the MARCOSIO services. Some of the challenges encountered in the project include requirements to purchase the EUMETSAT weather data at regional scale.

GMES&Africa in Western and North Africa, Bennet A. Foli (University of Ghana)

The presentation focused on MARCNoWA project which is funded by GMES & Africa Phase II covering West and North Africa regions with a total coverage of 18 countries. The project is implemented under the rationale that Marine Ecosystem is an integral driver of other socio-economic development issues. The objective is to improve human, infrastructural and institutional capacities on the management of Marine and Coastal Areas. The project is implementing 6 services: (i) Monitoring and forecasting oceanographic variables. Generates maps and creates dashboards, (ii) Fisheries resources management and protection. This includes vessel traffic information, forecast information, etc. (iii) Coastal vulnerability mapping and monitoring. This service addresses ocean erosion. Feed information includes wave heights, population, etc. (iv) Regional and marine weather forecasting. Fishermen are provided with 4-day forecast information through mobile apps and USSD channels. (v) Coastal ecosystems mapping. This service includes mapping ocean vegetation and (vi) Oil spill monitoring and warning service. The service identifies the vulnerable coastal zones following an oil spill event. University of Ghana as lead identifies dataset needs, assesses the infrastructural support, etc. and builds the capacities of participating partners. Academia Network is engaged to develop training materials and conduct the trainings. The consortium notes the need for easy and timely access to data that will lead to timely analyses and action by the concerned decision makers. The project emphasizes on the importance to provide accessible EO services that are applicable for use by target communities. African institutions need to strengthen indigenous capacity development and take ownership of infrastructures that come with projects so that their maintenance and operations are sustained.

EO for blue economy, example in Tanzania, Baraka Kuguru, Innocent Sailale, Happy Peter, Masumbuko Semba, Grayson Marwa and Ismael Kimirei (TAFIRI)

On behalf of Baraka Kuguru, Happy Peter described first the fishing activities in the Exclusive Economic Zone (EEZ) of Tanzania. In Tanzanian EEZ, one of the gap is to determine Hotspots and cold zone of Potential Fishing Zone (PFZ). TAFIRI has deployed a service on PFZ in both territorial waters and the exclusive economic zone. The objective to identify hotspots for Ilegal, Unreported and Unregulated (IUU) fishing practice and to develop algorithms for predicting PFZ. Satellite derived SST service is used to predict the PFZ. Overlay with satellite data is used to improve control and surveillance. TAFIRI is benefiting from the support of GMES & Africa to develop the PFZ service for Tanzania territorial waters and the EEZ. This service is benefiting for the marine spatial planning and to the ecosystem management. At last, Innocent Saillale shows the application on mobile phone for fishermen to locate PFZ

Marine weather forecast in Ghana, Eric Asuman (GMet) and Bennet A. Foli (University of Ghana)

Ghana Met and University of Ghana noted that fishermen and the fishing industry contribute largely to the country's GDP, and it is imperative to let the fishermen know the conditions at sea in advance. Bennet A. Foli and Eric Assuman presented a service dedicated to Ghana's fishermen in providing them Weather Forecasting in Ghana. This service is inherited from the EU funded MESA programme that has been consolidated within the GMES&Programme. Transmission of information and alerts are provided through various means (e.g app (UG-GMES), USSD code, text message). Then they described the role of the GMet in the implementation of the service: GMet is providing daily forecasts as well as coordinating activities of the Met agencies into the GMES project. This service is intended to be improved in extending it to North African countries as well as providing additional features to the service. GMet is conducted user feedback, in parallel of the user engagement

Forecasting Lake Victoria Storms using NWC Products, Jemimah Gacheru (KMD)

The presentation of Jemimah highlighted the utility of two NWC-SAF products in monitoring and nowcasting an intense storm that occurred on the Kenyan side of Lake Victoria on 25 February 2022. Indeed, The lake generates about $650M worth of fish and in capturing the development stages of the storm that hit Lake Victoria, which was not detected by the usual NWP, KMD contributed to the safety at lake. It also underscores a forecasting gap that can be filed by nowcasting in support of the Blue economy. Finally, it proposes ways in which NWC-SAF products and software can be more widely used for nowcasting in Africa.

EO support to navigation on Congo River and subsidiaries, Georges Gulemvuga (CICOS)

The presentation described one of the services implemented by the Consortia led by the CICOS within the framework of the GMES&Africa programme. This service intends to respond to urgent needs for fluvial transport. This support to navigation on Congo river and its subsidiaries has been developed since the EU funded AMESD project.

CICOS presented on the EO support for navigation of River Congo. Congo Basin is endowed with abundant natural resources. It is estimated that the inland navigation of River Congo is about 25,000km of waterways. Inland water navigation is the main mode of transport in the Congo Basin

The service uses bathymetric, hydrogeographic, hydrological and satellite data as the inputs. The service is provided through a mobile API alerting users on water levels. The service has created positive impacts such as Secure navigation, Reduction in time of travel, Increased trade between the urban and rural. The information about the level of the river is disseminated through SMS and Webportal to fluvial transporters.

Water resources and flow monitoring by satellite, Bachir Tannimoun (NBA)

Mr Bachir TANIMOUN informed the audience about the mission of the Niger Basin Authority (NBA). He detailed the various tools available to better know the water basin resource. The Niger Basin is vulnerable to flooding and other risks. A number of observing stations have been deployed at the Niger Basin to monitor the real-time situation,. Sath-Orio, a hydrological forecasting model has been developed into which NBA is integrating notably MSG data in developing the prediction models. Data from satellites provide accuracy of the model. Data dissemination to countries is provided through an ftp file interface. The project has built capacity for scientists, policy makers on the use of the tool. There is need for synergy at regional and national levels. Transition to MTG is needed in order to ensure sustainability of the Sath-Orio model and tools.

3. Discussions and Recommendations

After the plenary session, during the discussions, the following points have been raised:

- Discussions occurred on mandate of NMHSs in providing ocean weather forecasts and on how tio improve cooperation between GMES&Africa Marine and Coastal Services and NMHSs based on the inspiration given by the cooperation between University of Ghana and Ghana Meteorological Service;

- University of Ghana called for a collaboration with NMHSs of North Africa within the framework of the GMES&Africa phase 2 project in order to contribute to the establishment of the Weather forecast for fishermen service to this region. It has

been recommended to contact WMO Office to North, Central and West Africa to expand and deepen the partnership;

- GMES&Africa MARCOSIO consortium was encouraged to engage with users, policy and decision makers in all countries covered by their products, through awareness rising and training activities;

- GMES & Africa is inviting the meteorological community to synergize and work closely. GMES & Africa is a good case for synergy with meteorological communities, an example of the case with University of Ghana. University of Ghana is willing to transfer the knowledge and skills to other institutions such as the meteorological communities even in inland waters, and hence the University is reaching out to interested parties to register with them;

- Discussions take place on the transition to MTG for River Basins Authorities such as the NBA who run Run-off models based on meteosat data.

Session 4 contributed to recommendations **#10** to **#13**

SESSION 5 - CLIMATE MONITORING, CLIMATE SERVICES

Chairperson: Ladislaus Benedict Chang'a, TMA
Rapporteurs: Viola Otieno, ICPAC and Erdem Erdi, EUMETSAT

1. Session purpose and Content

The fifth session concentrates on Climate Change. It focuses on the implementation of Climate Services in Africa and on how earth observation is used to support Climate Monitoring and Services. In particular, this session highlights the use of Earth observation to support the development and operations of tools and services providing climate information. This session also comprises break-out sessions per Region on the status of implementation of the EU-funded Intra-ACP ClimSA programme.

2. Session contributions

Report of the Technical Sessions: #3: Climate monitoring / Climate services, Hervé Trebossen (EUMETSAT)

Hervé informed the audience about the results of the Online Technical Session dedicated to Climate monitoring / Climate services that was organised online the 09th June 2022 as a preamble of the 15th EUMETSAT User Forum in Africa. The objectives of the Interactive session was to inform participants (i) of the expected outputs of the ClimSA programme, (ii) the climate station that they will receive, (iii) the climate services that will be developed in their region and (iv) to inform on how EUMETSAT satellite and TAMSAT products could be used into the development of Climate services. This session was composed by 04 Introductory presentations and 5 splinter groups per region to collect feedbacks to their RCC about the implementation of the ClimSA as well as on the current use of Satellite data derived products for Climate Services.

Data cube for Drought and vegetation monitoring, Mark Higgins (EUMETSAT)

Mark Higgins gave first an overview of the data and tools available at the Copernicus Climate Service (C3S) notably the tailored services available for the following socio-economic sectors: agriculture, water and energy. Then, he informed that EUMETSAT is prototyping a Data Cube on Europe for Drought & Vegetation Monitoring. The idea is to bring data closer to the user with notably long-term analysis ready data, common data format. EUMETSAT would also been interesting in extending its prototype to Africa. Interests have been already expressed by some African institutions. Discussions are on-going with JRC to see complementarity with the ClimSA Climate Station. As a perspective, dialogue between EUMETSAT and potential stakeholders will play a crucial role to understand better the tasks and related challenges of climate services. Therefore, EUMETSAT would likely to collaborate on identifying those data that would be best suited to help solve a problem or a service.

Tamsat Climate Services, Ross Maidment (University of Reading)

Ross' talk presented a brief overview of the current and forthcoming TAMSAT climate services. TAMSAT's primary product is the rainfall product (v3.1) derived from Meteosat thermal infra-red imagery which now provides almost 40 years of temporally consistent rainfall estimates at the daily to seasonal scale for all Africa. The talk also presented two new rainfall products being developed - v3.2 which incorporates estimates of uncertainty with a latency of 24 hours and a satellite-gauge merged product. The talk also showcased a new full column soil moisture product and the TAMSAT-ALERT platform which can provide forecasts of soil moisture and hence agricultural drought.

Climate Monitoring SAF, Stephen Kothe (DWD /CM-SAF)

EUMETSATs Satellite Application Facility on Climate Monitoring (CM SAF) provides satellite-based long-term climate data records, which cover periods of partly more than 40 years. The CM SAF data record portfolio includes parameters in connection with the Earth energy and water cycle. The high accuracy, homogeneous data basis and the long-term coverage qualify CM SAF data for many applications, especially in Africa. We will present an overview of the CM SAF data and show how to use them.

ClimSA programme overview, Jolly Wasambo (ClimSA)

Jolly gave an overview of the African activities under the EU-Funded Intra-ACP ClimSA programme which is in support of the implementation of the Global Framework for Climate Services in the ACP region. The objective of the ClimSA programme is to strengthen the climate services value chain through building the capacities of decision-makers at all levels to make effective use of climate information and services. The Intra-ACP ClimSA programme is supporting, among others, the improvement of Decision Support System for Policy Development for sensitive key socio economic sectors (Agriculture & Food Security, Energy, Health, Water and Disaster Risk Reduction), the Certification of RCCs as WMO RCC compliance (ACMAD (Niger), AGRHYMET (Niger), ICPAC (Kenya), SADC-CSC (Botswana), CAPC-CA (Cameroon), Indian Ocean Network (Mauritius)) as well as the Sustainable Development & Climate Resilience Society.

Climate Station features and deployment, Marco Clerici (JRC)

Marco Clerici in his pre-recorded presentation informed the audience about the main characteristics of the Climate Station. The Climate Station is a key contribution of JRC for the ClimSA program [2019-2024] for the implementation of the GFCS in ACP countries. It gathers observations, forecast, projections and station data into a single operational environment, and builds on the achievements of previous EU funded programs in Africa (PUMA, AMESD, MESA and GMES&Africa). The African Regional Climate Centers (RCCs) received the Climate Station application in 2021, and an

enhanced version will be deployed to the NHMSs during 2023 though a supply contract managed by the AUC, including capacity-building initiatives.

ClimSA services at continental level, Leon Guy Razafindrakoto (ACMAD)

Leon Guy provided in his presentation information about the role of ACMAD in the ClimSA programme. He focused his speech on the User Interface Platform ACMAD is setting-up within the framework of ClimSA and the Continental Climate Outlook Forum that ACMAD is running in support to the following sectors: Agriculture, Health, water and DRR. Then, Leon provided also information about the Climate products and information that are and will be available notably (i) the technical notes to support NMHSs and RCCs forecasts briefings and climate fora, (ii) Bulletins, and reports for agriculture, water, DRR and health sectors and (iii) Statements, summaries, highlights for policy, decision makers.

The use-case of PPP in climate services, Mansur Bako Matazu (Nigeria Meteorological Agency, NiMet)

Mansur presented the use-case of Private Public Partnership in climate services was as implemented by NiMet. In Nigeria private sector engagement in public services delivery is guided by the ICRC Act adopted in 2005, the ICRC Public Private Partnerships Regulations in 2014 and the National Policy on PPP. This partnership is also guided by the necessity for NiMet more than thousands of varied recording and analytical instruments(especially AeroMet, AgroMet, MarineMet, ICT) and that technology and resources for maintenance and management are not always completely available at NiMet. Mansur illustrates his presentation with examples including the Installation of Lightning and Thunder Detectors in Airports with UbiMet, of AWS and synoptic stations with TAHMO.

3. Discussions and Recommendations

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

- Numerous data, data products and data access/analysis tool exist and are available to African users to support varied climate services;

- There is need for awareness creation and capacity building among potential users in Africa for TAMSAT products and the other products and tools (EUMETSAT Data Cube, CM SAF products and toolbox, Climate station);

- Proposition to explore a bottom-up approach in developing satellite products merged with station data; providing software to NMHS to merge station data with satellite data as the number of stations data availed to the GTS is limited;

- Some clarifications on the Climate Station were provided: Climate Station is built on MESA technology but separate hardware will be provided. The stations shall be procured by AUC for all regions except for SADC region;

- Call for closer collaboration between Africa institutions and European institutions (data/tool providers) to optimize utilization of available data/tools to improve climate services in Africa. Strengthened collaboration between the Africa institutions also encouraged to encourage skill/technology exchange.

The Session 5 contributed to recommendations **#14** and **#15**.

4. Outcomes of group discussions

After the plenary session, Group discussions were organized per region in order to discuss and inform about the ClimSA programme in their respective regions but also to collect feedback and recommendations from the NMHSs. The organisation was as follows:

- **WG#1:** ClimSA programme in ECOWAS region, faciltator: Seydou Traoré (AGRHYMET)
- **WG#2:** ClimSA programme in IGAD Region, faciltator: Zachary Atheru (ICPAC)
- **WG#3:** ClimSA programme in SADC Region, faciltator: Obadias Cossa (SADC/CSC)

In Central Africa (ECCAS) the **WG#4** (faciltator: Vincent Gabaglio (EUMETSAT)) discussed an approach to build regional and national capacities on the NWC-SAF software and to operationalize its use in the central Africa region.

In North Africa, the **WG#5** (Tareq Soubai (MétéoMaroc)) discussed the preparedness to MTG transition of the NMHSs.

SESSION 6 - TRAINING AND DATA ACCESS

Chairperson: Sarah Kimani, RAIDEG Chair
Rapporteurs: Heikki Pohjola, WMO Space Programme and Mark Higgins, EUMETSAT

1. Session purpose and Content

The sixth session was dedicated to data access and training. It will consist of presentations and discussions about the various means to get EUMETSAT data access (e.g online data store, EUMETCast Africa and Terrestrial, AfricaConnect). This Session will also discuss with the participants about the various training programme implemented in close cooperation with the African VLab Center of Excellence.

2. Session contributions

Report of the RAIDEG and Technical Sessions, Sarah Kimani (RAIDEG Chair)

Sarah, chair of the RAIDEG, first 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 and/or online) and their members are in regular contact. Since 2022, the Expert Group is under WMO RA-I Committee on Infrastructure. Sarah recalled the role of the RAIDEG and notably 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, the current activities, the outcomes of the 13thh meeting of RAIDEG held prior the 15-EUFA and the as well as the priorities and the work plan for years to come. In addition, Sarah informed the audience about the results of the PUMA 2015 survey conducted in August - September 2022 that saw an increase of the operational rate of these stations since 2021 (75% of the stations are functioning).

The second part of her presentation was dedicated to the results of the Online Technical Session dedicated to Data access and Training that was organised online the 8th June 2022 as a preamble of the 15th EUMETSAT User Forum in Africa. The objective of this session was to introduce the participants of the interactive sessions on the various systems operated by EUMETSAT to provide access to data and products. The participants had the opportunity to be informed and discuss about the various means to access EUMETSAT data, to learn more about EUMETCAST Terrestrial, Africaconnect initiative and cloud computing solution, to be informed and provide inputs to the VLab Training Centers activities. The presentations were followed by a session by working groups focused for some on data access and others on training. Among the key elements discussions within these WGs, Sarah cited the EUMETCast Terrestrial (what does it contain? Associated costs, Training needed), the support needed for the maintenance and use of the PUMA stations and the need for additional satellite meteorology training for meteorologists such as on convective storm training, high rainfall events/flooding, fog, temperature and frost.

Data access and User services, and latest EUMETSAT products, Sally Wannop (EUMETSAT)

In her presentation, Sally stated that EUMETSAT is reshaping its data services portfolio by introducing new web user interfaces (WebUIs) and application programming interfaces (APIs) to support for flexibility of use and incorporation into automated processing. The primary data access is still based on the EUMETCast-Africa dissemination system, which has been improved in terms of bandwidth, technology (from DVB to DVB-S2) and dissociated operation with respect to the EUMETCast-Europe service and described the additional data available through EUMETCast TERRESTRIAL. Sally also presented the web & internet access services that are currently available including Data access and Data Store services. Sally detailed the new features of the online EUMETView tool. 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 .

Data access live demonstration, Erdem Erdi (EUMETSAT)

In his presentation, a Erdem gave a live demonstration that shown to the audience two real-life EO data use cases.

In the first live demonstration, Erdem showed how to access a satellite product from EUMETView API using an open-source desktop GIS software and combine and visualize it along with other GIS data.

In the second demonstration, he showed and explained about how to download MSG data from Data Store API and how to automatize the process so that the latest NRT data is downloaded automatically and regularly without user intervention.

Using Pytroll for creating visualisations of Seviri and FCI data and products, Martin Raspaud (Pytroll / SMHI)

Martin Raspaud presented Pytroll which is a collection of free and open source python software modules build to read, process and write EO satellite. One of the most popular uses of Pytroll is the generation of imagery for visualization of EO satellite data. In this presentation, Martin showed how easy and flexible it is to generate both MSG-SEVIRI and MTG-FCI imagery, and how everyone can help make Pytroll modules even better. Martin explained how Pytroll is implementing out-of-memory processing (multi-core and distributed processing) to deal with FCI data size issue with good performance results. At last, he added that Pytroll acn be used to display other data such as the outputs of the NWC-SAF Software.

Use of NREN for Meteorology and climate, Yousef Torman (AfricaConnect / ASREN)

The presentation focused on the role and importance of research and education networks (NRENs and RRENs) to support the research and education communities in accessing resources through a high-speed dedicated connectivity to the regional and global research and education networks in addition to value added services that include eduroam and eduGAIN. NRENs are now more involved in Open Science, Open Access and Science Clouds which makes them more important than ever especially after being considered in the UNESCO's recommendations on Open science. Yousef' presentation gave special focus on engagements with science communities including Earth Observation, Climate actions and more.

EUMETSAT Training activities, Mark Higgins (EUMETSAT)

On behalf of Vesa Nietosvaara, training Oficer at EUMETSAT, Mark Higgins gave an overview of training and training opportunities within EUMETSAT and in collaboration with Vlab CoE training partners in Africa. Mark stated that the last few years, the traditional classroom training have suffered from pandemic, but an increasing amount of online training has helped in tackling this challenge. In the coming years, the training program will focus on MTG applications. He suggested to the potential trainees to check the Training courses Calendar that is available online (trainingevents.eumetsat.int) as well as additional resources (Training and data access) on the ASMET (https://asmet.africa/) and the EUMetrain (http://www.eumetrain.org/) websites. Then, Mark developed on the new training course that will be available for the MTG programme such as Core training on MTG data (as the data and products become available), Core new applications (e.g atmospheric composition). In addition, its is intended to increase the "test-bed" approach. At last, Mark reminded that needs for training can be addressed to the Training centres (Vlab CoE) and to the RAIDEG regional Representative[3].

Case Study of a Dust Storm in Southern Madagascar, Voahanginrina Anne Marie Pierrette RAMIANDRISOA (Direction Générale de la Météorologie Madagascar)

Madagascar is subject to increasingly frequent sand/dust storm phenomena and constitutes a growing challenge for the different socio-economic sectors. Voahanginrina Anne Marie Pierrette in its presentation showcase the monitoring, thanks to MSG-1 (IODC service), of one of this phenomena that occurred the 29th October 2020. At the end of the event, , this durst storm interested three regions of the South Madagsacar, going from Anosy/Androy (source zone) to reach the South of Atsimo Andrefana (dissipation zone). In terms of lessons learnt and perspectives, there is a need to develop capacities at DGM in monitoring, forecasting and

[3] https://community.wmo.int/en/activity-areas/wmo-space-programme-wsp/ra-i-dissemination-expert-group

alert/warning service of these dust storm phenomena in order to contribute to the reduction of their impacts, to strengthen observation infrastructures as well as to adopt the methods and practices used in the identification of source areas, the dynamics of the dust storm as well as the establishment of an early warning system.

3. Discussions and Recommendations

After the plenary session, during the discussions, the following points have been raised:

- Questions on EUMETSAT data access and services (EUMETView, available API);

- Discussions on the availability of the PyTROLL software modules to read, process and/or visualise EO satellites and notably the opportunity for the RARS Africa Hosting Sites to use these modules for the exploitation of the data received from the Polar orbiting Meteorological Satellites;

- Discussions on AfricaConnect on how NMHSs could engage with their respective NREN in order to connect to EUMETCast TERRESTRIAL that will allow access to all MTG data & products (contrary to EUMETCast-Africa);

- Discussions on training and especially on the new capabilities of MTG-I instruments (i.e FCI and LI) and their potential non strictly meteorological applications (e.g Active Fire Monitoring).

Session 6 contributed to recommendations #16 to #17

MAIN RECOMMENDATIONS AND CLOSING CEREMONY

The 15th EUMETSAT User Forum in Africa ended with a review of the Recommendations from the various Sessions of the Forum (see list of recommendations) and a closing ceremony, which included interventions of Vincent Gabaglio from EUMETSAT, Hon Khalid Salum Mohamed (MP), Minister of Infrastructure, Communication and transport of the Revolutionnary Government of Zanzibar, Tidiane Ouattara from AUC, Agnes Kijazi from TMA, MInistry of Works and Transport of the United Republic of Tanzania.

Vincent Gabaglio thanked all the speakers, organizers and participants for their commitment and contribution throughout the various sessions of the 15th EUMETSAT User Forum in Africa. He assured participants that EUMETSAT will have a close look at all 17 recommendations of the Forum and take actions in order to facilitate and follow-up their implementation in the coming years before the 16th Forum that is expected to take place in September 2024.

M. Ouattara thanks the United Republic of Tanzania and EUMETSAT for the organisation of the Forum. 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. He finally outlined the opportunity to improve cooperation between GMES&Africa and Meteorological Community for the benefits of African citizens.

Hon Khalid Salum Mohamed thanked all participants for their commitment and contribution throughout the various sessions of the Forum. He highlighted the need to pursue and consolidate the cooperation with EUMETSAT. He noted that the contribution provided by the participants in the recommendations of the forum will help EUMETSAT to improve its programmes for Africa while enhancing delivery of climate and environmental services in Africa. At last, he congratulated the Tanzanian Organizing Committee and the joint secretariat comprising of experts from Tanzania and EUMETSAT under the coordination of the Ministry of Works and Transport of the United Republic of Tanzania, for the well-coordinated preparations of this Forum.

EUMETSAT POINT OF CONTACT

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LIST OF ABBREVIATIONS

ACMAD	African Centre for Meteorological Application for Development
AfDB	African Development Bank
AGRHYMET	Regional Training and Application Centre for Operational Agrometeorology and Hydrology
AMCOMET	African Ministerial Conference on Meteorology
AMESD	African Monitoring of the Environment for Sustainable Development
AMSAF	African Meteorological Satellite Application Facility
API	Application Programming Interface
ASECNA	Agency for Aerial Navigation Safety in Africa and Madagascar
ASMET	African Satellite Meteorology Education and Training
AUC	African Union Commission
C3S	Copernicus Climate Change Service
CAMS	Copernicus Atmosphere Monitoring Service
CAPC-AC	Climate Application and Prediction Centre of Central Africa
CGMS	Coordination Group for Meteorological Satellites
CICOS	International Commission for the Congo-Oubangui-Sangha Basin
CM-SAF	Climate Monitoring SAF
DARBE	Department of Agriculture, Rural Development, Blue Economy, and Sustainable Environment
DRR	Disaster Risk Reduction
DVB	Digital Video Broadcasting
EAMAC	African School of Meteorology and Civil Aviation
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
EMA	Egyptian Meteorological Authority
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
FCI	Flexible Combined Imager
GFCS	Global Framework for Climate Services
GMES	Global Monitoring of the Environment and Security
GMet	Ghana Meteorological Agency
GTS	Global Telecommunication System
HPC	High Performance Computing
ICPAC	IGAD Climate Prediction and Applications Centre
IGAD	Intergovernmental Authority on Development

IMTR	Institute for Meteorological Training and Research
INTPA	Department for International Partnerships (DG INTPA)
IOC	Indian Ocean Commission
JRC	Joint Research Centre, European Commission
JWG	Joint Working Group
LI	Lightning Imager
LNB	Low Noise Block
MESA	Monitoring of Environment and Security in Africa programme
MHEWS	Multi Hazard Early Warning Systems
MSG	Meteosat Second Generation
MTG	Meteosat Third Generation
NBA	Niger Basin Authority
NBI	Nile Basin Initiative
NMHS	National Meteorological and Hydrological Service
NWC	Nowcasting
NWP	Numerical Weather Prediction
OACPS	Organisation of African, Caribbean and Pacific States
PR	Permanent Representative
PUMA	Preparation for the Utilisation of Meteosat Second Generation in Africa
RA-I	Regional Association One (WMO)
RAIDEG	RA-I Dissemination Expert Group
RARS	Regional Advanced Retransmission Services
RCC	Regional Climate Centre
RCOF	Regional Climate Outlook Forums
RDT	Rapid Development Thunderstorm
RECs	Regional Economic Communities
SADC-CSC	Southern African Development Community – Climate Services Centre
SAF	Satellite Application Facility
SAWIDRA	Satellite and Weather Information for Disaster Resilience in Africa programme
SIDS	Small Island Developing States
SOFF	Systematic Observation Financing Facility
TAFIRI	Tanzania Fisheries Research Institute
TAMSAT	Tropical Applications of Meteorology using SATellite data and ground-based observations
TFS	Tanzania Forest Services Agency
TMA	Tanzania Meteorological Authority
UPS	Uninterruptible Power Supply
VLab	Virtual Laboratory (WMO)
WEkEO	The EUMETSAT, ECMWF, EEA and MERCATOR OCEAN Copernicus DIAS service
WMO	World Meteorological Organization

ANNEXES

PROGRAMME OF THE FORUM

Plenary sessions

Day 1: Tuesday 13th September			
Session #1 - Introductory session			
Chairperson		**Agnes L. Kijazi**	**TMA**
Co-rapporteurs		Vincent Gabaglio	EUMETSAT
		Wilbert Muruke	TMA
11:00	African Space Policy (inc. GMES&Africa)	Tidiane Ouattara	AUC-ESTI
11:20	Revised Integrated African Strategy on Meteorology (Weather and Climate Services)	Jolly Wasambo	AUC
11:40	EUMETSAT programmes	Paul Counet	EUMETSAT
12:10	JRC contributions to enabling Earth Observation Services for decision-making in Africa	Ivan Kulis	European Commission
12:30	Q&A	Chairperson	
Lunch (12:30 - 14:00)			
Session #2 - Meteosat - Third Generation			
Chairperson		**Harsen Nyambe**	**AUC**
Rapporteurs		Paul Counet	EUMETSAT
		Mariane Diop Kane	AMCOMET
14:00	MTG programme	Katja Hungershoefer	EUMETSAT
14:30	Main benefits of MTG for Africa	Sarah Kimani	RAIDEG
14:45	Transition 2023-2025: Overview	Vincent Gabaglio	EUMETSAT
	• data access: upgrade of the PUMA stations	Jolly Wasambo	AUC
	• training: overview of activities	Vesa Nietosvaara	EUMETSAT
15:20	Report of the Technical Sessions Meteosat Third Generation	Jolly Wasambo	AUC
15:30	Meteosat for aerial navigation safety	Hama Hamidou	ASECNA
15:45	Q&A (15')	Chairperson	
Break (16:00 - 16:30)			
16:30	Q&A Cont'd (15')	Chairperson	
16:45	Proposal for a MTG-AMSAF programme	Mariane Diop Kané	Abidjan Declaration JWG
17:00	Open discussion		
18:00	End of Day 1 / programme overview of Day #2	Chairperson	

Day 2: Wednesday 14th September			
Session #3 - Disaster Risk Reduction (Early warning for Early Action) Satellite contribution to Multi Hazard Early Warning Systems			
Chairperson		**Dr Pascal Waniha**	***TMA***
Rapporteurs		Sally Wannop	*EUMETSAT*
		Leon Razafindrakoto	ACMAD
09:00	DRR and MHEWS in Africa Africa Multi-Hazard Early Warning and Action System for DRR Situation Room	Lusajo Ambukege	AUC
09:15	SAWIDRA and NWP in Africa	Leon Guy Razafindrakoto	ACMAD
09:30	Nowcasting SAF, products and use in Africa	Xavier Calbet	NWC SAF
10:00	RSMC NWC regional approach	Nico Kroese	SAWS
10:15	Q&A	Chairperson	
Break (10:30 - 11:00)			
11:15	Situation room at ICPAC	Viola Otieno	ICPAC
11:30	Delivering nowcasting to users in Ghana	Maureen Abla Ahiataku	GMet
11:45	Early warning for disaster risk reduction	*Emad Moselhi*	Egyptian Meteorological Authority
12:00	Active Fire Monitoring in Tanzania	Kekilia Kanalimu	Tanzania Forest Services Agency
12:15	Q&A / Open discussion on contribution of EO for DRR	Chairperson	
Lunch (12:30 - 14:00)			
Session #4 - Blue Economy			
Chairperson		**Ms. Linda Amornghor-Oje Etta**	**AUC**
Rapporteurs		Hervé Trebossen	EUMETSAT
		Meshack Ndiritu	AUC
14:00	Blue Economy Strategy	Linda Amornghor-Oje Etta	AUC
14:15	EUMETSAT products for blue economy	Sally Wannop	EUMETSAT
14:30	EO support for GMES & Africa's Marine and Coastal Operations for Southern Africa and the Indian Ocean	Lufuno Vhengani	CSIR
14:50	G&A in Western and North Africa	Bennet A. Foli	Univ of Ghana
15:10	EO for blue economy, example in Tanzania	Baraka Kuguru	TAFIRI
15:45	Q&A (15')	Chairperson	
Break (16:00 - 16:30)			
16:30	Marine weather forecast in Ghana	Eric Asuman Bennet A. Foli,	GMet Univ of Ghana,
16:45	Forecasting Lake Victoria Storms using NWCSAF Products	Jemimah Gacheru	KMD
17:00	EO support to navigation on Congo River and subsidiaries	Georges Gulemvuga	CICOS
17:15	Water resources and flow monitoring by satellite (SATH-ORIO)	Bachir Tannimoun	NBA
17:30	Q&A (15')	Chairperson	
18:00	End of Day 2 / programme overview of Day #3	Chairperson	

Day 3: Thursday 15th September				
Session #5 - Climate Change, Climate monitoring and services				
Chairperson			**Ladislaus Benedict Chang'a**	**TMA**
Rapporteurs			Viola Otieno	ICPAC
			Erdem Erdi	EUMETSAT
09:00	Report of the Technical Sessions #3: Climate monitoring / Climate services		Herve Trebossen	EUMETSAT
09:15	Data cube for Drought and vegetation monitoring		Mark Higgins	EUMETSAT
09:25	Tamsat Climate Services		Ross Maidment	University of Reading
09:35	Climate Monitoring SAF		Stephen Kothe	CM-SAF
10:05	ClimSA programme overview		Jolly Wasambo	ClimSA
10:15	Climate Station features and deployment		Marco Clerici	JRC
Break (10:35 - 11:00)				
11:00	ClimSA services at continental level		Leon Guy Razafindrakoto	ACMAD
11:15 - 12:30	Break Out Rooms	WG#1 ClimSA programme in ECOWAS region	Seydou Traore	AGRHYMET
		WG#2 ClimSA programme in IGAD Region	Zachary Atheru	ICPAC
		WG#3 ClimSA programme in SADC Region	Obadias Cossa	SADC/CSC
		WG#4 ClimSA programme in ECCAS Region	Vincent Gabaglio	EUMETSAT
		WG#5 Climate services in North Africa	Tareq Soubai	Meteo Maroc
Lunch (12:30 - 14:00)				
Technical visit				

Day 4: Friday 16th September			
Session #6 - Training and data access			
Chairperson		**Sarah Kimani**	**RAIDEG Chair**
Rapporteurs		Heikki Pohjola	WMO Space Programme
		Mark Higgins	EUMETSAT
09:00	Report of the RAIDEG and UFA Technical Sessions	Sarah Kimani	RAIDEG Chair
09:20	Data access and User services, and latest EUMETSAT products	Sally Wannop	EUMETSAT
09:40	Data access live demonstration	Erdem Erdi	EUMETSAT
10:00	Using Pytroll for creating visualisations of Seviri and FCI data and products	Martin Raspaud	Pytroll / SMHI
10:20	Use of NREN for Meteorology and climate	Yousef Torman	AfricaConnect / ASREN
10:40	Q&A	Chairperson	
Break (11:00 - 11:20)			
11:20	EUMETSAT Training activities	Vesa Nietosvaara	EUMETSAT
11:50	Etude de cas d'une Tempête de poussière dans le Sud de Madagascar	Voahanginrina Anne Marie Pierrette RAMIANDRISOA	Direction Générale de la Météorologie Madagascar
12:10	Q&A	Chairperson	
Lunch (12:30 - 14:00)			
Session #7 - Recommendations review & adoption			
Chairperson		**Agnes L. Kijazi**	**TMA**
Rapporteurs		Vincent Gabaglio	EUMETSAT
		Hervé Trebossen	EUMETSAT
14:00	Feedback from 15th EUMETSAT User Forum in Africa	Participants of the 15-EUFA	
14:20	Hosting of the 16th EUMETSAT User Forum in Africa		
14:30	Review and adoption of the main recommendations of the 15-EUFA	All	
Closing Ceremony			

Interactive sessions

Day 1 : 8th June				
#0 Introductory session				
Moderator			Vincent Gabaglio	EUMETSAT
08:00	Opening remarks (10') / Setting the scene		Paul Counet Harsen Nyambe Mariane Diop Kane	EUMETSAT / AUC (DARBE) / WMO
08:10	Introduction to the Interactive sessions and splinter groups (10')		Vincent Gabaglio	EUMETSAT
08:20	Report of RAIDEG activities (10')		Sarah Kimani	IMTR/RAIDEG
08:30	Review of the recommendations from the14-EUFA (10')		Herve Trebossen	EUMETSAT
08:40	Q&A (20')			
#1 EUMETSAT data access and training				
Chairperson			Sarah Kimani	SAWS
Rapporteur			Sally Wannop	EUMETSAT
09:00	EUMETSAT Data access		Erdem Erdi	EUMETSAT
09:15	MTG-Africa: Training aspects		Vesa Nietosvaara	EUMETSAT
09:30 - 09:50	Vlab Training Centres activities for 2022-23 (5' each)		Nicholas Maingui	KMD
			Mark Higgins	EUMETSAT
			Bennet Foli	University of Ghana
			Erdem Erdi	EUMETSAT
09:50	Q&A (10')			
10:00	End of the Session			
Break (10:00 - 12:00)				
#1 EUMETSAT data access and training (Cont'd)				
12:00	Africaconnect-3		Yousef Torman	ASREN
12:15	Introduction to the WGs		Vincent Gabaglio	EUMETSAT
12:20 - 13:40	**Splinter session (WG) - Parallel**	WG #1 : Data access (ENG/FR)	Nico Kroese	SAWS
			Sally Wannop	EUMETSAT
		WG #2 : Data access (ENG)	Kwame Adu Agyekum	University of Ghana
			Erdem Erdi	EUMETSAT
		WG #3 : Data access (FR)	Maixent Kambi	DMN Congo Brazzavile
			Herve Trebossen	EUMETSAT
		WG #4 : Training (FR)	Tareq Soubai	Meteo Maroc
			Vincent Gabaglio	EUMETSAT
		WG #5 : Training (ENG)	Sarah Kimani	IMTR
			Natasa Strelec Mahovic	EUMETSAT
13:40	Report of the Working Group #1 to #5		Rapporteurs from WG #1 to #6	
14:00	End of the Session			

Day 2 : 9th June				
#2 Meteosat Third Generation				
Chairperson			Jolly Wasambo	AUC (DARBE)
Rapporteur			Vincent Gabaglio	EUMETSAT
8:00	MTG for Africa (inc, Product User Guide)		Katja Hungershoefer	EUMETSAT
8:15	PUMA-202X-MTG station (specifications and deployment in Africa)		Jolly Wasambo	AUC
8:30 - 9:40	**Splinter sessions (WG) - Parallel**	WG #1 : Transition Roadmap and New PUMA-202X-MTG stations (ENG/FR)	Diakana Kone	EAMAC
			Katja Hungershoefer	EUMETSAT
		WG #2 : Transition Roadmap and New PUMA-202X-MTG stations (ENG)	Sarah Kimani	IMTR
			Erdem Erdi	EUMETSAT
		WG #3 :MTG-I data (FCI and LI instruments) (ENG)	Nico Kroese	SAWS
			Vesa Nietosvaara	EUMETSAT
		WG #4 :MTG-I data (FCI and LI instruments) (FR)	Leon Guy Razafindrakoto	ACMAD
			Vincent Gabaglio	EUMETSAT
		WG #5 : MTG North Africa(MTG-Up) (FR and Arabic)	Tareq Soubai	Meteo Maroc
			Herve Trebossen	EUMETSAT
9:40	Report of the Working Group #1 to #5		Rapporteurs from WG #1 to #5	
	Break (10:00 - 12:00)			
#3: Climate monitoring / Climate services				
Chairperson			Dieudonne Nsadisa Faka	OACPS
Rapporteur			Hervé Trebossen	EUMETSAT
12:00	Climate Station (15')		Christophe Lavaysse	JRC
12:15	Datacube for Drought and Vegetation monitoring (15')		Carla Barroso	EUMETSAT
12:30 - 13:15	**Splinter Sessions (WG) - Parallel**	WG #1 Western Africa (ENG/FR)	Seydou Traore	AGRHYMET
			Hervé Trebossen	EUMETSAT
		WG #2 Central Africa (FR)	Pascal Moudi	CAPC-AC
			Vincent Gabaglio	EUMETSAT
		WG #3 Southern Africa (ENG) and Indian Ocean	Mathias Rabemananjara	SADC-CSC
			Gina Bonne	IOC
			Christophe Lavaysse	JRC
		WG #4 Eastern Africa (ENG)	Zachari Atheru	ICPAC
			Marco Clerici	JRC
		WG #5 North Africa (Arabic/ENG)	Erdem Erdi	EUMETSAT
13:15	Report of the Working Group #1 to #5		Rapporteurs from WG #1 to #5	
13:45	#4 Concluding remarks			EUMETSAT

OPENING CEREMONY SPEECHES

Technical Note by Dr Agnes KIJAZI, Director General of the Tanzania Meteorological Authority and Third Vice-President of the World Meteorological Organization (WMO),

[Protocol observed]

I would like to begin my technical note by expressing my sincere gratitude to My Government, The Government of the United Republic of Tanzania through you Honorable Prime Minister for allowing this 15th EUMETSAT User Forum in Africa" to take place here in Dar es Salaam, Tanzania. Also to the "European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) and all the collaborating partners for the trust and opportunity given to Tanzania Meteorological Authority (TMA) to host and co-organize the 15th EUMETSAT User Forum in Africa. The decision to bring the forum to Tanzania affirms the trust and our continued collaboration in the provision of climate services to the society. We value this opportunity and we assure you of our commitment towards attainment of the anticipated goals, which include enhancing the capacity in the provision of meteorological services by National Meteorological and Hydrological Services (NMHSs) and its applications in Africa.

Honourable Guest of Honour, Ladies and Gentleman,

Data is the fundamental requirement to carry out the functions of National Meteorological and Hydrological Services (NMHSs) include monitoring the evolution of weather and climate systems and weather forecasting. In that regard, National Meteorological and Hydrological Services (NMHSs) are obliged and mandated to make systematic observations of weather systems to monitor any impending weather related hazards, prepare weather forecasts and communicate the information to the general public and socio-economic sectors.

Honorable Guest of Honour, Ladies and Gentleman,

The EUMETSAT satellite observation programmes in Africa play a significant role in complementing the work of NMHSs by bridging the data gap in data sparse areas of Africa including Tanzania due to their capability to observe a large area from space. Satellite imagery and data avails information even at locations where ground observations are not available. Satellite data is also useful in Numerical Weather Prediction (NWP) through data assimilation to produce products for Disaster risk reduction and for use in blue economy sectors, as we will observe though the themes to be discussed during this week. Therefore NMHSs in Africa including TMA are direct beneficiaries of satellite data and products provided by EUMETSAT.

Honourable Guest of Honour, Ladies and Gentleman,

Through this Forum, users will discuss with EUMETSAT as service provider to agree on the ways for improvement of their services in Africa. Therefore, through this forum, users of data provided by EUMETSAT, particularly NMHSs will get an opportunity to provide their views for resolving the challenges they are facing.

Honourable Guest of Honour, Ladies and Gentleman,

I wish to re-iterate that the 15th EUMETSAT User forum in Africa is an opportunity of great benefit for meteorological services across the entire African continent. As providers of meteorological services at national level, we are also privileged to have stakeholders of climate services from socio-economic sectors have been invited to this forum. Therefore we are looking forward to have a wide spectrum of views that EUMETSAT will consider for improvement of their services to the NMHSs of Africa.

I would like to conclude my remarks by urging stakeholders, both from NMHSs and socio-economic sectors to participate actively in the discussions to ensure that the requirements of both providers and users of meteorological services are identified and actionable interventions that suit the needs of Africa are identified.

Thank you very much for your Attention

Asante sana

Statement by Phil Evans, EUMETSAT Director-General EUMETSAT Director General

[Protocol observed]

It is a great please and honor for me to be here in Dar es Salaam, United Republic of Tanzania, for the opening of the 15th EUMETSAT User Forum in Africa, and to meet all of you in person.

Let me first thank our Guest of Honor and our Host, the Tanzania Meteorological Authority under the Ministry of Works and Transport, for the very warm welcome in the country and for the attention that they brought to us and each participant.

We initiated the preparation for this Forum 3 years ago, as the initial plan was to hold it in September 2020. But the COVID-19 pandemic arrived and changed these plans. We hold the 14th Forum last year virtually, and resumed the preparation this year for this 15th Forum. And we are finally here, all together, four years after the Forum in Abidjan, Cote d'Ivoire.

As you will see in the coming days, many activities have taken place over the past years. Despite the COVID situation, we have been able to provide satellite data to our users in Africa, without interruptions. We have also made significant progress in the preparation of our new generation satellites. We will actually launch the first satellite of the new Meteosat Third Generation at the end of this year, from Kourou in French Guyana.

This first Meteosat Third Generation satellite will be positioned over Africa, and it will provide unprecedented observations of weather and climate from space over the continent. It will indeed offer, thanks to new innovative instruments, more observations, more frequently and with an higher-resolution to track severe weather events and monitor the climate.

This first satellite will be followed by 5 other ones, in geostationary orbit over Africa and 6 new ones in the so-called low earth orbit, providing an even more accurate and comprehensive observation of the Earth system globally. These two new constellations will provide valuable information for the next two decades.

This information is even more precious in a changing climate. Last week, the African Union Commission and the WMO have issued their report on the State of the Climate in Africa in 2021. The report highlights that climate change is already a reality in Africa, and also recommends mitigation measures.

In a changing climate, extreme weather events become more frequent. Better observations of the weather and climate are needed to improve Early Warning Systems. This will help the national weather services and disaster management units to pertinently advise, warn and protect lives, livelihoods and infrastructure.

Better observations of the weather and climate are also needed to improve climate services. They inform decision makers in climate-sensitive socio-economic sectors about adaptation measures to increase resilience against climate change.

The data from our current and new generations of satellite will certainly help here. As we did for the last two decades, we expect to provide our new satellite data and products free of charge for the national meteorological services and other national users in Africa, in accordance with the new WMO Unified Data Policy adopted last year.

The opportunities arising from these new satellite constellations have been well considered by our African partners at technical and policy level.

Indeed, the revised Integrated Africa Strategy on Meteorology that was adopted by the African Union Assembly at the 35thAU Summit at the beginning of this year, is very explicit about the need for Africa to take benefit from MTG. Beyond early warning and climate change, MTG will improve weather services in the transport, agriculture and water management sector.

Honorable Minister and Deputy Minister,

Dear participants,

The opportunities offered by MTG come with new challenges!

The quantity of the data provided by satellites will increase drastically in the years to come. This implies challenges for accessing and processing these data. Current system will need to be considerably improved. And capacities in Africa, as well as in Europe actually, will need to be strengthened to transform the MTG opportunities into improved services for the population.

Satellite data play an increasingly crucial role for weather forecasting and climate monitoring in Africa. The transition to MTG by 2025 is a must. It is needed to ensure continuity of the services provided today based on the current Meteosat Second Generation. And to deliver better services in the future thanks to the new observations.

This challenge was captured in the Abidjan Declaration, signed by the AUC, AMCOMET and the Regional Economic Communities in 2018. Yesterday we met to take stock of the progress made since then, to discuss a Concept note for a MTG-Africa – AMSAF programme and agree on a way forward.

To overcome the challenges of this transition, we shall build on the successful partnership established more than 20 years ago between Europe and Africa. I would like here to thank our partners: the African Union Commission, the WMO, the AMCOMET and the European Commission, who has funded several Capacity Building

programmes to support weather, climate and environmental monitoring services in Africa, such as PUMA, MESA, ClimSA and GMES&Africa.

EUMETSAT is ready to play its role in facilitating the transition to MTG. Our 30 Member States adopted last year a new Strategy: “Destination 2030”.

Cooperation with Africa is fully part of this Strategy. And the objective remains for us to ease the access to our satellite data and facilitate their use in the African continent in response to your own needs.

EUMETSAT will implement these activities in Africa taking fully into account the policy context and priorities that are set in Africa, via the Agenda 2063 of the Africa Union, and more specifically through the Integrated African Strategy on Meteorology, and the Africa Space Policy and Strategy.

We will also rely on the Africa-Europe Strategic Partnership, that was reinforced during the February 2022 EU-AU Summit, through the “Joint Vision for 2030”, and the associated investment package.

This Europe-Africa partnership has also facilitated the cooperation on the Copernicus programme. Copernicus satellite and services make large amount of data available for the monitoring of the ocean, the atmospheric composition and for climate analysis. EUMETSAT operates several Copernicus satellites and provides the data, free and open, to African users, including in Tanzania.

On EUMETSAT side, we will continue to work to ensure that Africa can fully benefit from both EUMETSAT and Copernicus and can develop innovative services based on this space infrastructure.

As you can see, we have in front of us many opportunities and challenges.

This 15th Forum is therefore very timely. We will provide information on our activities, and hear your suggestions. It is also a platform for you, to share your experience in working with satellite data. The recommendations that will arise from the Forum will help improving access and use of weather and climate monitoring from space.

I wish that this Forum will allow us to make significant step forward in our cooperation.

Together, we can ensure that Africa will continue to fully benefit from satellite data for weather and climate services, in support the implementation of the African Union Agenda 2063, the joint Europe-Africa Partnership and WMO regional plan.

I thank you for your attention and wish you all a successful Forum.

SPEECH BY Hon. ATUPELE FREDY MWAKIBETE (MP), DEPUTY MINISTER WORKS AND TRANSPORT, REPRESENTING PRIME MINISTER OF THE UNITED REPUBLIC OF TANZANIA AND GUEST OF HONOUR AT THE OPENING OF THE FIFTEENTH EUMETSAT USER FORUM IN AFRICA, 13TH SEPTEMBER 2022; DAR ES SALAAM, TANZANIA

[Protocol observed]

It is with great honor and privilege to get this opportunity on behalf of the Government of the United Republic of Tanzania to address you today at this opening ceremony of an important and historical event, the Fifteenth "European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) User Forum in Africa (15th EUFA). It is a historical event because it is being held for the first time here in Dar es Salaam the "Haven of Peace" in the United Republic of Tanzania since EUMETSAT began organizing "User Forums in Africa" in 1995 (23 years ago).

On behalf of the Government of the United Republic of Tanzania and on my own behalf, I wish to express my sincere gratitude to the organizers for giving me this honor, and for choosing the United Republic of Tanzania to host the 15th EUMETSAT User Forum in Africa. In this gesture, allow me to convey warm greetings from Her Excellency Samia Suluhu Hassan, the President of the United Republic of Tanzania.

Ladies and Gentlemen,

Let me extend my warm welcome to all of you; I trust that you will both have a pleasant stay in Dar es Salaam, and that you will get an opportunity to see some of Tanzanian's natural attractions found in Dar es Salaam, Zanzibar, Arusha, Kilimanjaro and other touristic destinations in the country some of which are among seven wonders of the world. Tanzania is gifted with several National Parks and natural attractions, which include Ngorongoro Crater, Mount Kilimanjaro (the highest mountain in Africa and the highest single free-standing mountain in the world, standing at 5,895 metres above sea level), Mikumi National Park, The Spice Islands of Zanzibar, and the Serengeti National Park, just to mention a few. I encourage all of you to spare your time and visit some of these beautiful natural attractions during this time or in the near future.

Ladies and Gentlemen,

I would also like to thank EUMETSAT for the continued support to Africa in meteorological activities, which have been of great support and benefit to the continent. We are very grateful for this support and collaboration. The Government of the United Republic of Tanzania would like to assure you of its utmost support in this initiative in addressing the weather and climate risks facing our people. This service from EUMETSAT contributes to the implementation of the Sendai Framework for Disaster Risk Reduction (DRR) and bring us closer to achieve the UN Sustainable Development Goals (SDGs) for the wellbeing of our people. The Service also

contributes to the implementation of the National strategic documents such as National Environmental Policy (2021) and the National Framework for Climate Services (NFCS) which advocate for weather and climate monitoring to support sustainable socio-economic development of the country.

Ladies and Gentlemen,

Tanzania as host of this event is very much pleased with the objective of the forum, especially the themes of the planned sessions. These themes tally with Tanzania's priorities for enhancing weather and climate services, and they present a cross-cutting role in socio-economic development of the country and the African continent at large. The forum is a good complement for socio-economic development through strengthening climate change adaptation and Disaster Risk Reduction in Tanzania and the African continent.

Ladies and Gentlemen,

I have been informed that, 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 and Hydrological Services (NMHSs) and their regional centres, in order to identify actions and initiatives that could be taken by EUMETSAT to meet the requirements of its African partners.

In the stated purpose of the forum, I would like to draw your attention to the expected output, which is: Identification of actions and initiatives for addressing the requirements of users of EUMETSAT partners, particularly the National Meteorological and Hydrological Services and their regional centres.

Ladies and Gentlemen,

As we all know, the economies of the majority of African countries, Tanzania inclusive are dependent on climate sensitive sectors including Agriculture, Livestock, Fisheries, Water, Hydro Electric Power, and so forth. The inherent variability nature of climate system poses a great risk to the lives, properties, livelihoods and economies of our people, particularly the most vulnerable communities, and the National economy at large. The variability of weather and climate systems has been found to be a contributing factor to the occurrence of weather and climate extreme events, including droughts and floods.

Furthermore, the impact of climate change has caused an unprecedented increase of hydro-meteorological disasters due to increase in drought and flood events in terms of frequency and intensity. The disasters have led to widespread socio-economic impacts in many parts of the world.

Ladies and Gentlemen,

Tanzania like many other African countries and elsewhere in the world has witnessed an increase in disasters associated with extreme weather and climate events including floods and droughts, with considerable impacts on human lives, livelihoods and properties. For instance, floods and droughts in 2020 and 2021 were reported to cause damage of infrastructure, destruction of human residences and properties, affected transportation services, death of livestock and humans at times in some parts of Tanzania.

Ladies and Gentlemen,

In view of the risk that climate variability and change is posing to communities, economic sectors and the national economy, it is imperative to monitor and predict weather accurately and ensure that early warning information reaches the needy communities timely and, in a cost, effective manner. Accurate and timely weather and climate information is key for effective planning of socio-economic activities. Accurate weather and climate information will also support climate change adaptation and reduction of weather-related disasters.

I am glad that EUMETSAT through its space observation programmes in Africa is contributing in weather observation and monitoring and share this information through National Meteorological and Hydrological Services (NMHSs) to help in addressing these challenges.

Ladies and Gentlemen

Mindful of the requirements of the NMHSs to deliver reliable meteorological services to the society, the Government of the United Republic of Tanzania under the leadership of Her Excellency Samia Suluhu Hassan, the President of the United Republic of Tanzania in collaboration with other partners has been at the fore front to strengthen the capacity of Tanzania Meteorological Authority in addressing the requirements in TMA's Strategic Plan. Among the deliberate interventions undertaken is the investment in observation and monitoring of weather and climate whereby the Tanzania Government has supported TMA to procure meteorological infrastructure and acquisition of necessary expertise for enhancing observation, monitoring and availability of quality data. Through the Government support TMA has been able to install 50 Automatic Weather Stations (AWSs) and meteorological RADARs network comprising of seven (7) RADARs of which three (3) are operational, two (2) are about to be installed, and two (2) are at manufacturing stage.

These initiatives are also in line with the ruling party "Chama cha Mapinduzi" election Manifesto of 2020, which put strong emphasis on strengthening conservation and management of the environment, including addressing the challenge of climate change in the country. Among the strategic interventions stipulated in the manifesto include construction of infrastructure such as the Standard Gauge Railway and Julius Nyerere Hydropower Dam for generation of about 2115 MW Hydroelectric Power,

which are all weather dependent. Enhancement of Meteorological Infrastructure in this case has very much contributed to the increased accuracy of weather forecasts in the country. In terms of enhancing the capacity of Meteorological personnel, The Government is supporting and making use of the National Meteorological Training Centre (NMTC) in Kigoma, which also has a cross border accreditation by our National Council for Technical Education (NACTE). Furthermore, the Government established a BSc in Meteorology programme at the University of Dar es Salaam conducted in collaboration with the Tanzania Meteorological Authority (TMA). Training programmes conducted in these Institutions and from other International prtner fellowships have been crucial for the expertise in Meteorology and the increased accuracy of weather forecast we enjoy today.

Ladies and Gentlemen,

I am pleased that this forum has included sessions with themes on data access, climate change and Disaster Risk Reduction (DRR). I have noted that they are broad thematic areas in which the requirements of NMHSs of Africa can be derived. I have the confidence to say that this forum has the potential to address the requirements of the Meteorological sector in Africa with the focus on the challenges facing the NMHSs in connection to the needs of end users in weather and climate services that may be addressed through EUMETSAT programmes.

Ladies and Gentlemen,

The long lasting value of the 15th EUMETSAT User Forum in Africa will be brought up by proper identification of specific requirements for National Meteorological and Hydrological services of Africa with relevant initiatives and actions. This in turn will help in addressing the chronic challenges for Africa with regards to provision of weather and climate services. In that regard, the EUMETSAT programme will contribute sustainably in enhancing early warning services to support socio-economic development, climate change adaptation and Disaster Risk Reduction in a cost effective manner.

It is my hope that, through the planned activities the objective of the forum with the focus on African context will be achieved. With these few remarks, I would like to declare that the Fifteenth EUMETSAT User Forum in Africa is officially opened. I wish you fruitful deliberations.

Thank you very much for your attention

Asanteni sana kwa kunisikiliza

REMARKS BY DR. ALLY POSSI, DEPUTY PERMANENT SECRETARY MINISTRY OF WORKS AND TRANSPORT-THE UNITED REPUBLIC OF TANZANIA AT THE OPENING OF THE FIFTEENTH EUMETSAT USER FORUM IN AFRICA, 13TH - SEPTEMBER 2022; DAR ES SALAAM, TANZANIA

[Protocol observed]

As you may have noted in the programme, my role in this opening ceremony is to invite the Guest of Honor, Right Honorable Kassim M. Majaliwa (MP), the Prime Minister of the United Republic of Tanzania to officiate this forum. Before I invite the Gueat of Honor to deliver his opening remarks, please allow me to say few words.

First and foremost, I would like to thank the Guest of Honor for accepting to officiate this “Fifteenth EUMETSAT User Forum in Africa” despite of his very busy schedule. This shows the great importance he has attached to meteorological services and disaster risk reduction supported by EUMETSAT amid alarming dangers of climate change in the world with significant impacts felt in Africa as well.

Let me join the Director General of the Tanzania Meteorological Authority (TMA) who is also the Third Vice President of the World Meteorological Organization (WMO), Dr. Agnes Kijazi to welcome all delegates to this forum. I do believe that you will have an unforgettable experience while in Dar es Salaam and Tanzania during the days allocated for this forum and beyond as time and resources will permit.

Guest of Honor, Ladies and Gentlemen,

As you are already aware that, Meteorology Sector is key and an important crosscutting sector to all other socio-economic sectors in Tanzania as it is with other countries in Africa and the world. The need for meteorological services for the growth of other socio-economic sectors cannot be underestimated in particular due to the adverse impacts triggered by climate variability and change. This is to say that, enhancing resilience to the risks and reduction of related disasters necessitates improved weather and climate services for planning of socio-economic activities to support sustainable socio-economic planning. This in turn requires investment in sustainable weather and climate services that suit the needs of societies and various socio-economic sectors.

Guest of Honor, Ladies and Gentlemen,

Sustainability of meteorological services that meet user needs requires joint efforts by all stakeholders. Furthermore, effective collaboration among the stakeholders needs an environment that enables stakeholders to work together for achieving a common goal. In that regard, the Ministry of Works and Transport of the Government of Tanzania, which is responsible for meteorology has made enormous efforts to spearhead development of enabling environment to support collaboration between TMA and other stakeholders in the sector, including Development Partners,

International Organizations, Private Sector, Civil Society Organizations and Academia. The enabling environment in place include the Tanzania Meteorological Authority Act No. 2 of 2019 which mandates TMA not only to provide weather and climate services, but also to be a regulator of players in the sector.

Guest of Honor, Ladies and Gentlemen,

The government of Tanzania through the Ministry responsible for Meteorology has continued to allocate funds in its annual budget to strengthen the meteorology sector in the country. The focus in this regard is to enhance meteorological infrastructure and capacity building for meteorological personnel, which include training and rehabilitation of our National Meteorological Training Centre (NMTC) in Kigoma. Given that the NMTC has a National Council for Technical Education (NACTE) cross border registration, I would like to take this opportunity to invite prospective candidates from all over Africa and especially our neighbours in the EAC and SADC to bring your staff and young people to enroll for meteorological courses at our Training Centre.

Guest of Honor, Ladies and Gentlemen,

To conclude, I would like to call upon all stakeholders to make good use of meteorological services offered by our National Meteorological and Hydrological Services and for our case in Tanzania, the Tanzania Meteorological Authority (TMA). Doors are open for collaborations and partnerships with the Government in the investment and enhancement of Meteorological services in the country according to the Tanzania Meteorological Act No. 2 of 2019. EUMETSAT activities in Africa present a good example of such collaborations in Africa and in Tanzania. Thank you for these initiatives.

Guest of Honor,

After these few insights, it is now my humble request to invite you Honorable Prime Minister to officiate the 15th EUMETSAT User Forum in Africa.

Thank you for listening.

AHSANTE SANA

Speech by Ambassador Manfredo Fanti, Head of the European Union Delegation to Tanzania and to the EAC

[Protocol observed]

It is a great pleasure to be here today and contribute to the opening of this 15th EUMETSAT event on behalf of the European Union. I am pleased to see so many climate change specialists, great scientists and meteorologists.

This is the first physical event since the last forum in Abidjan in Sept 2018 held in this beautiful city of Dar es Salaam. I have checked the weather forecast on the website of Tanzania meteorological Authority (TMA) and it looks like that the day will be sunny and bright. We will discuss this evening during the dinner if the forecast was accurate!

You must be wondering the reason for my presence this morning in this forum.

First let me say that the European Union is a long standing partner of Tanzania cooperating in a number of areas: security, governance, transport, agriculture, digitalisation, management of natural resources, energy, trade, private sector development. Recently we signed a programme to support the sustainable development of two cities in Tanzania, Mwanza and Tanga and the island of Pemba. We are now negotiating another programme promoting the development of the blue economy in Tanzania. The session tomorrow regarding space services for implementing a blue economy strategy will be very useful for our future programme.

Climate events in the recent years have impacted the implementation of development strategies of our African partners. The sustainable economic growth in Tanzania and the region is vulnerable to the increasingly frequent devastating weather extremes associated with climate change.

The EU and the African Union during the last Summit in February 2022 recognised the importance to address climate change in our various Green Transition and Digitalisation cooperation activities as part of “the Joint Vision for 2030”. This is also another important priority of our Global Gateway strategy.

Through various programmes since 2002 (PUMA, AMESD, MESA), the EU has supported the procurement of satellite data reception stations in each sub-Saharan country providing continuous access and exploitation of earth observation satellites data to African national and regional institutions such as the national meteorological and hydrological services, universities, regional weather or climate change centres. Satellite observations are an essential input to weather prediction and to gather long-term information from space in support of climate change adaptation and mitigation.

The ongoing programme ClimSA funded by EU is for example providing services to our African partners to design and implement their agriculture and blue economy strategies or to carry out a proper disaster risk reduction plan. One objective of this

programme is to strengthen the capacity of African Regional Climate Centres to convert data into user-friendly information. It can inform for instance farmers when to plant certain crops, when to irrigate and when to harvest. It can also help countries and regions to prepare for possible disease outbreaks and make strategic decisions on water and energy infrastructure.

Through the same programme, new generation satellite data reception stations will be procured by the African Union Commission compatible with the Meteosat third generation data which will enable more precise monitoring of our changing atmosphere, land surfaces and ocean. This will probably be an important investment for implementing the blue economy strategy of Tanzania for example.

The EU has been informed about the need for African partners to strengthen their capacities to fully benefit from these satellite services, key for climate sensitive socio economic sectors. This was well documented in the latest recommendations of the Abidjan declaration chaired by the African Union Commission.

Strengthening the capacities of the various partners is an important task for the years to come. This will also require the development of a robust network of institutions to share data, experience and propose services to end-users such as fishermen in case of extreme weather forecasts on the Lake Victoria, or flash flooding in Dar es Salaam. This network could also be useful to develop South-South cooperation.

Our goals are ambitious, and we can achieve them only in collaboration with our partners. All these digital solutions are only useful if design and implemented together with the right local partners leading to a sustainable uptake of space-based information and services.

Going beyond this programme, I would like to mention the various support we are providing regarding space services to Africa:

First, we do have a bilateral arrangement with the African Union to share data gathered by the Copernicus programme using high bandwidth hub-to-hub network connections. This fosters the exchange of Earth observation data between Europe and Africa. This data can be used to develop tools to monitor the environment, crops, water bodies and coastal ecosystems, as well as for disaster management, among many others.

Second, the Global Monitoring for Environment & Security (GMES) & Africa is a EUR 50 million project and focuses on information services value chain: from access to data, to process them and tailor-make to needs of African countries, to training people to policy and institutional framework. It also involves the private sector and encourages partnerships between private sector companies.

Speaking about biodiversity: we monitor protected areas through the BIOPAMA project and support specialised forest observatories in Central Africa (OFAC) and in East Africa (OFESA).

These are examples that tell about partnership, ownership and life-changing applications.

Obviously, EU-Africa space cooperation also goes beyond earth observation and already includes projects around satellite use (EGNOS) for regulating air traffic (in cooperation with the Agency for the Safety of Air Navigation in Africa [ASECNA]).

To conclude, “Space-based information and services” as a truly global digital tool can certainly be instrumental in achieving the goals of the EU Global Gateway, as well as supporting our partners meeting their objectives.

I wish you fruitful sessions that will be able to provide you with relevant information on the main activities and benefits of satellite data in Africa for general information or for decision making processes.

In particular, I hope that the Forum will allow you to be updated on the status of related programmes, to identify possibilities of collaboration and also on future perspectives linked to the transition to new generation of satellites data & products.

Thank you.

CLOSING CEREMONY

CLOSING REMARKS BY HONOURABLE KHALID SALUM MOHAMED (MP), MINISTER OF INFRASTUCTURE, COMMUNICATION AND TRANSPORT OF THE REVOLUTIONARY GOVERNMENT OF ZANZIBAR AT THE CLOSING OF THE FIFTEENTH EUMETSAT USER FORUM IN AFRICA, 16TH -SEPTEMBER 2022; DAR ES SALAAM, TANZANIA

[Protocol observed]

It is a great honor for me to address you today at this closing ceremony of the “Fifteenth European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) User Forum in Africa (15th EUFA). I would like to appreciate the organizers’ decision to invite me to officially close this event which was unique and of great importance to the African continent and to Tanzania in particular.

Ladies and Gentlemen,

I would like also to congratulate all of you for your active participation in this “Fifteenth EUMETSAT User Forum in Africa”, and for the deliberations that you have had with the aim of enhancing the use of satellite data and products provided by EUMETSAT to African Users. The need for enhancing meteorological services is due to the fact that meteorological information is a fundamental ingredient for sustainable socio-economic development, especially in Africa where the most national economies depend on weather and climate sensitive sectors. The contribution you provided in the recommendations of this forum are very much appreciated, as they will help EUMETSAT to improve its programmes for Africa while enhancing delivery of climate and environmental services in Africa. This will eventually reduce the risks of African societies to the prevailing weather and climate related disasters, which threaten livelihoods, and economies of this continent.

Ladies and Gentlemen,

As we all know, scientific reports and policy documents have continued to indicate that most of the disasters occurring in the world are hydro-meteorological related. According to the WMO Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes report of 2020, weather, climate, and water-related hazards accounted for over 2 million deaths and economic damage of about 3.64 trillion USD between 1970 and 2019. Low income countries, including the majority of African countries are the most vulnerable to socio-economic impacts of such disasters.

Ladies and Gentlemen,

Furthermore, National Meteorological and Hydrological Services of African states have limited capacities in the provision of meteorological services, especially availability of essential meteorological and other environmental data for provision of quality weather forecasts to support objective planning and decision making in socio-economic sectors. The inadequacy in the data to provide meteorological services of the required quality makes Africa to remain vulnerable to the risks of weather and climate disasters.

Ladies and Gentlemen,

In view of the vulnerability of Africa to risks of hydrometeorological disasters, initiatives to support reduction of such disasters are an urgent priority. It is also an excellent idea to integrate the initiatives with stakeholders engagement, which will ensure that we focus on the actual and pressing needs of stakeholders. In that context, I wish to commend EUMETSAT for implementing programmes specific for Africa on meteorological satellite observation and monitoring, and for the frequent dialogues to improve the services through the EUMETSAT User Fora in Africa.

Ladies and Gentlemen,

In ensuring that the EUMETSAT programs contribute adequately in addressing the specific meteorological challenges facing Africa, I am pleased to note that the deliberations in this forum were organized in sessions that focused on specific topics including climate change and Early Warning for Early Action. I am also glad to note that in each of the topics you deliberated on, you made specific recommendations on appropriate actions and initiatives that could be taken by EUMETSAT to meet the requirements of African partners.

I wish to congratulate you for this commendable milestone and I am looking forward to the implementation of the recommended actions in the near future. On behalf of the Government of the United Republic of Tanzania, I would like to assure you continued utmost support by the Government on the implementation of the planned actions for Tanzania.

Ladies and Gentlemen,

I would like to conclude my closing remarks by once again thanking EUMETSAT for organizing the Fifteenth EUMETSAT User Forum in Africa here in Dar es Salaam, Tanzania. I believe that the forum will leave a long lasting legacy to all of us. I wish also to congratulate the Tanzanian Organizing Committee and the joint secretariat comprising of experts from Tanzania and EUMETSAT under the coordination of the Ministry of Works and Transport of the United Republic of Tanzania, for the well-coordinated preparations that enabled the success of the forum.

Ladies and Gentlemen,

Once again, I would like to thank the Ministry and EUMETSAT for organizing this important forum and for inviting me to officiate this closing ceremony. I wish all delegates and participants safe journey back home. For those who came from outside Tanzania, I strongly advise you to extend your stay in Tanzania and arrange to visit some of our tourism attraction in Kilimanjaro, Zanzibar, Serengeti and Ngorongoro. I am quite sure you will not regret you decision.

With that note, I would like to declare that the Fifteenth EUMETSAT User Forum in Africa is officially closed.

Thank you very much for your attention

Asanteni sana kwa kunisikiliza

DAR ES SALAAM HIGH-LEVEL STATEMENT

High level Statement on

Meteosat Third Generation (MTG) for Africa and the African Meteorological Satellite Application Facility (AMSAF)

Dar es Salaam, 12 September 2022

Déclaration de haut niveau

sur Météosat Troisième Génération (MTG) pour l'Afrique et la Facilité Africaine pour les Applications des Satellites Météorologiques (AMSAF)

Dar es Salam, le 12 septembre 2022

We, representatives of the African Union Commission (AUC), the African Ministerial Conference on Meteorology (AMCOMET) met in Dar es Salaam, on the 12th September 2022 upon the invitation of the Ministry for Works and Transport of the United Republic of Tanzania, in the presence of the representatives of the Regional Economic Communities, the World Meteorological Organization (WMO), the African Centre of Meteorological Applications for Development (ACMAD), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), and the European Union (EU), on the eve of the 15th EUMETSAT User Forum in Africa.

Nous, représentants de la Commission de l'Union Africaine (CUA), de la Conférence Ministérielle Africaine sur la Météorologie (AMCOMET) nous sommes réunis à Dar es Salaam, le 12 septembre 2022 à l'invitation du Ministère des Travaux Publics, et des Transports de la République Unie de Tanzanie, en présence des représentants des Communautés économiques régionales, de l'Organisation météorologique mondiale (OMM), du Centre africain pour les applications de la météorologie au développement (ACMAD), de l'Organisation européenne pour l'exploitation de satellites météorologiques (EUMETSAT) et de l'Union européenne (UE), à la veille du 15ème Forum des Usagers d'EUMETSAT en Afrique.

We recall the **Abidjan Declaration on the *Next Generation of Satellites Products for Weather and Climate services in Africa*** signed in September 2018 by the AUC, the AMCOMET President and the representatives of the Regional Economic Communities, under the auspices of the Minister for Transport of the Republic of Côte d'Ivoire, and which called upon the strengthening of African capacities to:

Nous rappelons la **Déclaration d'Abidjan sur la prochaine génération de produits satellitaires pour les services météorologiques et climatologiques en Afrique** signée en septembre 2018 par la CUA, le Président de l'AMCOMET et les représentants des Communautés économiques régionales, sous les auspices du Ministre des transports de la République de Côte d'Ivoire, et qui a appelé au renforcement des capacités africaines pour :

- ensure a ***smooth transition*** from Meteosat Second Generation ***to the new Meteosat Third Generation (MTG),*** and secure access to, and exploitation of MTG satellite data and products in support to the Agenda 2063 of the AUC as well as a contribution to the achievement of the Sustainable Development Goals;

- assurer une ***transition en douceur*** de Meteosat Seconde Génération ***vers le nouveau Meteosat Troisième Génération (MTG)***, et sécuriser l'accès et l'exploitation des données et produits satellitaires MTG à l'appui de l'Agenda 2063 de la CUA ainsi qu'une contribution à la réalisation de les Objectifs de Développement Durable;

- and explore 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, in line with the African Space Policy and Strategy.

- et explorer la faisabilité de développer et d'établir, sur la base des capacités existantes, une ***Facilité Africaine pour les Applications des Satellites Météorologiques (AMSAF)*** permettant de générer des produits satellitaires pour les services météo-rologiques et climatiques adaptés aux besoins du continent africain pour son développement socio-économique conformément à la politique et stratégie spatiales africaines;

We note that the Abidjan declaration was presented to the 4th AMCOMET Session in 2019, and that sustainable access to and use of

***Nous* notons** que la déclaration d'Abidjan a été présentée à la 4ème session de l'AMCOMET en 2019, et que l'accès et l'utilisation durables de

MTG and establishment of an AMSAF are part of the Integrated African Strategy on Meteorology (Weather and Climate Services) (2021-2030) that was approved by the 35th African Union Summit (Assembly/AU/Dec. 819(XXXV) – lit.125.) in January 2022.

MTG et la mise en place d'un AMSAF font partie de la Stratégie africaine intégrée sur la météorologie (services météorologiques et climatologiques) (2021-2030) qui a été approuvé par le 35e Sommet de l'Union africaine (Assembly/AU/Dec. 819(XXXV) - lit.125.) en janvier 2022.

We consider that climate events in the recent years demonstrated once again that the sustainable economic growth of Africa is vulnerable to the increasingly frequent devastating weather extremes associated with climate change and **noted** that decision makers at all levels in Africa need sound and reliable information on weather, climate and the environment to plan and act in climate-sensitive sectors, such as agriculture, blue economy, water management, transport, renewable energy, and disaster risk reduction.

Nous considérons que les événements climatiques de ces dernières années ont démontré une fois de plus que la croissance économique durable de l'Afrique est vulnérable aux extrêmes météorologiques dévastateurs de plus en plus fréquents associés au changement climatique et avons **noté** que les décideurs à tous les niveaux en Afrique ont besoin d'informations solides et fiables sur le temps, le climat et l'environnement pour planifier et agir dans les secteurs sensibles au climat, tels que l'agriculture, l'économie bleue, la gestion de l'eau, les transports, les énergies renouvelables et la réduction des risques de catastrophe.

We further note that the first MTG satellite is planned to be launched at the end of 2022, and that the Third generation will provide unprecedented observation of weather and climate over Africa every 10 minutes with a 1 km spatial resolution for the next two decades.

Nous notons en outre que le premier satellite MTG devrait être lancé à la fin de 2022 et que la troisième génération fournira une observation sans précédent du temps et du climat sur l'Afrique toutes les 10 minutes avec une résolution spatiale de 1 km durant les deux prochaines décennies.

We note the benefits expected from MTG satellites data and AMSAF products for future weather and climate services in Africa, and the potential positive impact on key sectors such as transport, agriculture, blue economy, water management, renewable energy and early warning of natural disaster;

Nous notons les bénéfices attendus des données satellitaires MTG et des produits AMSAF pour les futurs services météorologiques et climatiques en Afrique, ainsi que l'impact positif potentiel sur des secteurs clés tels que les transports, l'agriculture, l'économie bleue, la gestion de l'eau, les énergies renouvelables et l'alerte précoce en cas de catastrophe naturelle ;

We also note the benefits of the combined use of MTG and Copernicus data for these sectors.

Nous notons également les avantages de l'utilisation combinée des données MTG et de Copernicus pour ces secteurs.

We **note** the support of the EU and EUMETSAT since 2002 through EU funded programme such as PUMA, AMESD, MESA, GMES&Africa and ClimSA that are implemented by the AUC and regional consortia and are ensuring continuous access and exploitation of Earth observation satellites

Nous notons le soutien de l'UE et d'EUMETSAT depuis 2002 par le biais de programmes financés par l'UE tels que PUMA, AMESD, MESA, GMES&Africa et ClimSA qui sont mis en œuvre par la CUA et des consortiums régionaux et garantissent un accès et une exploitation continus des données des satellites d'Observation de la

data by African national and regional institutions, such as the National Meteorological and Hydrological Services, universities, the Regional centres and consortia.

We note the outcomes and recommendations of the Abidjan Declaration Joint Working Group (JWG), chaired by AUC and composed of regional representatives, and we concur to the Concept-Note for a MTG-AMSAF programme whose objective is to strengthen African capacities to access meteorological and climate satellite derived data, and to deliver, through innovative products and services, adequate information to decision makers in various socio-economic sectors.

We note also the Joint Vision of the 6th EU-AU Summit held in February 2022, and considered that the use of MTG in Africa falls into the EU-AU cooperation areas related to Green Transition and Digitalisation,

We further note the recommendation of the AMCOMET Bureau meeting, 9th September 2022, Maputo, that calls upon Partners to urgently fund the MTG-AMSAF programme to ensure timely and smooth transition to MTG which is a priority for the implementation of the Maputo Ministerial Declaration on "Bridging the Gap between Early Warning and Early Action" adopted in September 2022.

In conclusion,

We encourage the AUC and the EU to mobilise resources to fund activities proposed in the Concept note for the MTG-AMSAF programme and promote its implementation at Continental, Regional and national levels.

We request the AUC, AMCOMET Secretariat and EUMETSAT to continue providing support to the implementation of the Abidjan Declaration.

Terre pour les institutions nationales et régionales africaines, telles que les Services météorologiques et hydrologiques nationaux, les universités, les centres régionaux et les consortiums.

Nous avons pris note des résultats et des recommandations du Groupe de Travail Conjoint sur la Déclaration d'Abidjan (JWG), présidé par la CUA et composé de représentants régionaux, et nous avons approuvé la Note Conceptuelle pour un programme MTG-AMSAF dont l'objectif est de renforcer les capacités africaines d'accès aux données météorologiques et climatiques dérivées des satellites, et de fournir, grâce à des produits et services innovants, des informations adéquates aux décideurs dans divers secteurs socio-économiques.

Nous avons également pris note de la vision conjointe du 6ème sommet UE-UA qui s'est tenu en février 2022 et avons considéré que l'utilisation de MTG en Afrique relève des domaines de coopération UE-UA liés à la transition verte et à la transition numérique,

Nous notons en outre la recommandation de la réunion du Bureau de l'AMCOMET, tenue le 9 septembre 2022 à Maputo, qui appelle les partenaires à financer d'urgence le projet MTG-AMSAF afin d'assurer une transition en douceur vers MTG, ce qui est une priorité pour la mise en œuvre de la Déclaration ministérielle de Maputo sur "Réduire l'écart entre l'alerte précoce et l'action rapide" adopté en septembre 2022.

En conclusion,

Nous encourageons la CUA et l'UE à mobiliser des ressources pour financer les activités proposées dans la note conceptuelle du programme MTG-AMSAF et à promouvoir sa mise en œuvre aux niveaux continental, régional et national.

Nous demandons à la CUA, au Secrétariat de l'AMCOMET et à EUMETSAT de continuer à apporter leur soutien à la mise en œuvre de la Déclaration d'Abidjan.

We further request EUMETSAT to continue providing Meteosat data free of charge to Africa in accordance with the WMO Unified Data Policy Resolution (Res.1) adopted in 2021, and, considering the novelty of new MTG instruments, to continue easing access and provide regular training to its African users.

We request the AUC to communicate to the European Commission this High Level Statement and the Concept note for an MTG Africa – AMSAF programme requesting to include the proposed activities as part of upcoming Europe-Africa regional Actions in Space, Earth Observation and related services supporting Green Transition and Digitalisation.

Nous demandons en outre à EUMETSAT de continuer à fournir gratuitement les données Meteosat à l'Afrique conformément à la résolution de l'OMM sur la politique unifiée des données (Res.1) adoptée en 2021 et, compte tenu des nouveaux instruments innovants de MTG, de continuer à faciliter l'accès et à fournir une formation régulière aux utilisateurs africains.

Nous demandons à la CUA de communiquer à la Commission européenne cette déclaration de haut niveau et la note conceptuelle d'un programme MTG Afrique - AMSAF demandant de l'inclure dans les activités proposées dans le cadre des prochaines actions régionales Europe-Afrique sur l'espace, l'observation de la Terre et les services connexes soutenant la Transition verte. et la Transition numérique.

Done in Dar es Salaam, The United Republic of Tanzania, on Monday 12th September 2022, in 5 original copies.

Fait à Dar es Salam, République-Unie de Tanzanie, le 12 Septembre 2022, en 5 exemplaires.

For the United Republic of Tanzania
Pour la République Unie de Tanzanie

Hon. Atupele Fredy Mwakibete (Mp),
Deputy Minister for Works and Transport
on behalf of Honourable Prof. Makame Mnyaa Mbarawa (Mp), Minister of Works And Transport of The United Republic of Tanzania

For the AMCOMET
Pour l'AMCOMET

Hon. Jean Ernest Masséna Ngallè Bibéhè
Président du bureau de l'AMCOMET et Ministre des Transports de la République du Cameroun

For the African Union Commission
Pour la Commission de l'Union Africaine

H.E. Josefa Leonel Correia Sacko
Commissioner for Agriculture, Rural Development, Blue Economy, and Sustainable Environment

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