Regional Association I (Africa)

Abridged Final Report of the Seventeenth Session

Cairo, Egypt

21–23 February 2019
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BACKGROUND INFORMATION SUPPORTING THE WORK OF THE SESSION (PART II TO THE PRESENT REPORT)
1. The acting president of Regional Association I (Africa) (RA I), Mr Daouda Konate, opened the seventeenth session of RA I on 21 February 2019 at 2.30 p.m. at the Conference Centre of the Egyptian Meteorological Authority in Cairo. He welcomed the delegates and Permanent Representatives and expressed his gratitude to the government of Egypt for hosting the meeting. Africa is one of the most vulnerable continents to climate and weather disasters. Droughts, flash floods and heatwaves cause social upheaval and major food insecurity. These derail the development strategies of Members and Agenda 2063. We must move quickly to implement the Integrated African Strategy on Meteorology (Weather and Climate Services) to mitigate weather and climate risks. This needs to be at the centre of the African development agenda to support decision-making and maximize socioeconomic benefits to be accrued through effective weather, water and climate services.

The Permanent Representative of Egypt with WMO, Dr Ahmed Abdel–Aal welcomed all Permanent Representatives and delegates to Egypt. He expressed his appreciation for the election of His Excellency Lieutenant General Younis Almasry, Minister of Civil Aviation of Egypt as Chair of the African Ministerial Conference on Meteorology (AMCOMET) during the AMCOMET High Level Segment on the preceding day. Climate change is negatively impacting human life. We need to find effective solutions for the security and welfare of African citizens. We need to implement a strategy to improve National Meteorological and Hydrological Services (NMHSs) to make sure they fulfil their mandate and make improvements to their infrastructure and early warning systems. We are very happy to receive so many experts. We hope that at the end of this meeting we will have a good strategy to address these continental challenges.

Prof. Petteri Taalas, Secretary-General of the World Meteorological Organization, welcomed the delegates and Permanent Representatives and expressed his gratitude to the government of Egypt for hosting the meeting, and in particular to His Excellency Lieutenant General Younis Almasry, Minister of Civil Aviation. He reminded the meeting that Africa is the most vulnerable continent when it comes to weather and climate variability and change. The impact these have on food security, public health and safety, and the economy can lead to social unrest in some countries. Climate change will continue to impact sea level rise, increase temperatures, affect ecosystems, produce heat waves and flash floods and increase air pollution, resulting to harm to human health.

He further reminded the session that the United Nations Secretary-General will hold a climate summit in September 2019 to give a boost to the upcoming United Nations Framework Convention on Climate Change Conference of the Parties. There is therefore an urgent need to advance climate adaptation, for example, to improve early warning systems, to encourage North-South cooperation and to enhance services on the continent. He also reminded the participants that many United Nations Sustainable Development Goals have a weather and climate component. He reiterated his commitment and that of WMO to supporting NMHSs in Africa in areas such as IT infrastructure, observations, and weather and climate services and in building partnerships with development partners.

2. The agenda of the session is provided in Appendix 1.

3. The session adopted 18 resolutions, given in Appendix 2, and 11 decisions, given in Appendix 3.

4. The Association elected Mr Daouda KONATE as president and Dr Ahmed ABD EL-AAL as vice-president.

5. The list of participants is given in Appendix 4. Out of a total of 69 participants, 18 were women, i.e. 26%.

6. The seventeenth session of RA I closed at 1.30 p.m. on 23 February 2019.
APPENDIX 1. AGENDA

1. ORGANIZATION OF THE SESSION
   1.1 Opening of the session
   1.2 Keynote address: WMO reform
   1.3 Adoption of the agenda
   1.4 Establishment of committees
   1.5 Programme of work of the session
   1.6 Other organizational matters

2. REPORTS
   2.1 Report by the president of the Association
   2.2 Report by the chairpersons of working groups
   2.3 Report of the Regional Office
   2.4 Report from the Regional Conference

3. RA I STRATEGIC PRIORITIES AND EMERGING ISSUES IN WEATHER, CLIMATE AND WATER
   3.1 Weather and disaster risk reduction
   3.2 Climate and water
   3.3 Observations and infrastructure

4. CAPACITY DEVELOPMENT, EDUCATION AND TRAINING, PARTNERSHIPS
   4.1 Education and training
   4.2 Country Profile Database
   4.3 Development partnerships in RA I
   4.4 Public-private engagement in RA I

5. WORKING SMARTER - RA I FUTURE GOVERNANCE
   5.1 WMO Strategic and Operating Plan and Governance Reform 2020–2023 - Regional aspects
   5.2 Internal matters of the Association
   5.3 Gender issues

6. ELECTION OF OFFICERS

7. DATE AND PLACE OF THE EIGHTEENTH SESSION

8. CLOSURE OF THE SESSION
APPENDIX 2. RESOLUTIONS ADOPTED BY THE SESSION

Resolution 1 (RA I-17)
Enhancing multi-hazard and impact-based services for disaster risk reduction in Regional Association I

REGIONAL ASSOCIATION I (AFRICA),

Recalling:

(1) Resolution 2 (Cg-17) – Implementation of the WMO Strategy for Service Delivery, requesting the Executive Council (EC) to support the further development of service delivery by Members in the area of impact-based forecast and warning services, Resolution 9 (Cg-17) – Identifiers for cataloguing extreme weather, water and climate events, and Resolution 10 (Cg-17) – Sendai Framework for Disaster Risk Reduction 2015–2030 and WMO participation in the International Network for Multi-hazard Early Warning Systems,

(2) Decision 3 (EC-70) – Further implementation of the WMO Disaster Risk Reduction Roadmap, Decision 4 (EC-70) – Development of the Global Multi-hazard Alert System, and Decision 5 (EC-70) – Support to the United Nations and humanitarian agencies,

(3) Decision 4 (EC-69) – Impact-based decision support services, with regard to the implementation of the WMO Guidelines on Multi-hazard Impact-based Forecast and Warning Services (WMO-No. 1150),

Noting the draft WMO Strategic Plan 2020–2023 as endorsed by Recommendation 20 (EC-70) – WMO Strategic Plan, for submission to the Eighteenth World Meteorological Congress,

Noting further:

(1) The adoption of the Paris Agreement by the Conference of the Parties to the United Nations Framework Convention on Climate Change in December 2015,


Considering:

(1) The importance of user-driven, integrated, fit-for-purpose and actionable approaches to service delivery to better serve societal needs as stipulated in the WMO Strategy for Service Delivery and the draft WMO Strategic Plan 2020–2023,

(2) The considerable risks from hydrometeorological and other natural and human-caused hazards in Regional Association I (Africa) (RA I), especially due to climate change, increasing vulnerabilities, exposure and protracted crises and humanitarian emergencies,

(3) The ongoing activities and opportunities in RA I for further collaboration with experts and other organizations in the following areas of disaster risk reduction (DRR) in line with the WMO DRR Roadmap:

(a) DRR governance,

(b) Hazard and risk analysis,

(c) Multi-hazard early warning systems (MHEWSs) and services,

(d) Support to the United Nations and other humanitarian agencies,
Decides to endorse the following recommendations from the Regional Conference of the seventeenth session of RA I (RECO-17):

(1) Task the RA I Management Group:

(a) To develop an overview map of all DRR-related projects in RA I to share best practices;

(b) To coordinate, in collaboration with World Meteorological Centres and Regional Centres, the implementation of subregional pilot projects of the Global Multi-hazard Alert System (GMAS) Africa, starting in subregions of southern and East Africa, benefiting from their experience in the provision of warnings within the context of the Severe Weather Forecasting Demonstration Project;

(2) Request Members to enhance collaboration between National Meteorological and Hydrological Services (NMHSs) and their end users, particularly disaster management agencies, the hydrology, agriculture and health sectors, and so forth, and to facilitate the implementation of impact-based forecasting and risk-based warning services;

Further decides:

(1) To align its operating plan and relevant activities with the WMO DRR Roadmap to support the implementation of the Sendai Framework as well as regional strategies and plans regarding DRR, climate change adaptation (CCA) and resilience building, and in particular:

(a) To strengthen the RA I partnerships with (sub)regional organizations (such as the African Union Commission, subregional economic commissions, the Climate Prediction and Applications Centre of the Intergovernmental Authority on Development, the Regional Office for Africa of the United Nations Office for DRR, and so forth) and regional bodies of international organizations and to support WMO Regional Centres to provide early warning information;

(b) To encourage its Members’ NMHSs to engage at the highest level of their national DRR and CCA mechanisms and to participate in their national delegations to the Africa–Arab Platform on Disaster Risk Reduction (next session planned for 2020) and the Global Platform for Disaster Risk Reduction (sixth session to be held from 13 to 17 May 2019 in Geneva);

(c) To nominate NMHS WMO DRR focal points in the WMO Country Profile Database;

(2) To test the methodology for cataloguing high-impact weather, water and climate events, as recommended by the EC at its seventieth session, learning from the pilot phase conducted in RA VI (Europe), and to provide feedback on the outcomes to the EC Working Group on DRR;

(3) To strengthen multi-hazard early warning services and to contribute to the WMO GMAS by:

(a) Enhancing the national MHEWSs of Members in RA I, benefiting from good practices in RA I and from regional and global support mechanisms;

(b) Supporting the GMAS concept as a driver and vehicle for:

(i) Capacity development at national, subregional and regional levels;

(ii) Efficient outreach to and recognition from key national, regional and global users and stakeholders, especially humanitarian organizations and agencies;

(iii) Harmonization/standardization of warnings;
APPENDIX 2. RESOLUTIONS ADOPTED BY THE SESSION

(c) Exploring regional/transboundary multi-hazard early warning mechanisms/platforms/advisory systems as a possible contribution to a future GMAS based on RA I Members’ good practices (such as the Severe Weather Forecasting Demonstration Project’s sub-projects) and a continued assessment of the Members’ requirements in this area;

(4) To support national humanitarian preparedness and response agencies, as well as United Nations and other regional and global humanitarian agencies, by contributing to the development of, and by participating in, a WMO Coordination Mechanism (WCM) that enables easy access to authoritative information, provides expert advice to these agencies to respond to their immediate requests in anticipation of, and during or after hydrometeorological hazardous situations, and allows for an internal mechanism to provide relevant guidance, coordination and support to Members;

(5) To request the African Union Commission, in collaboration with WMO, to strengthen various components related to DRR and humanitarian activities;

Requests the Secretary-General:

(1) To facilitate technical assistance and assist with resource mobilization for and the coordination of projects in support of DRR and capacity development activities in the region;

(2) To allocate resources to complement the contributions from Members in the development of a WCM to better support humanitarian action;

(3) To hold regular consultations on the requirements of NMHSs with respect to risk assessments in the region;

(4) To organize a WMO workshop/conference on innovation in MHEWS/GMAS to share best practices and to facilitate the enhancement of Members’ capacity, especially least developed countries and small island developing States;

Requests the president of RA I and the RA I Management Group:

(1) To facilitate and support the implementation of the cataloguing testing phase by engaging the relevant working groups and volunteering NMHSs of RA I Members;

(2) To document good practices with MHEWS and DRR activities as well as capacity development projects targeted at NMHSs of RA I Members;

(3) To gather, in collaboration with the Secretariat and the Expert Group on GMAS, under the guidance of the EC Working Group on DRR, RA I Members’ expectations from and requirements for a regional or subregional warning platform and a GMAS as well as their capacities and readiness for involvement in such mechanisms.

Note: This resolution replaces Resolution 5 (RA I-16) – Implementation of disaster risk reduction activities in Regional Association I (Africa), which is no longer in force.
Resolution 2 (RA I-17)

Filling the gap regarding the implementation of the Common Alerting Protocol for effective public weather service delivery in Regional Association I

REGIONAL ASSOCIATION I (AFRICA),

Recalling the Seventeenth World Meteorological Congress: Abridged final report with Resolutions (WMO-No. 1157), general summary, paragraphs 3.1.58 and 3.1.59 under International exchange of public forecasts and warnings, and paragraphs 4.1.25 and 4.1.26 under Severe Weather Forecasting Demonstration Project (SWFDP),

Noting the need of users at the national and international levels, including the humanitarian community, to have fast and easy access to authoritative warnings,

Noting further the growing importance of the international exchange of hydrometeorological warnings between Members,

Mindful that the efficient and accurate dissemination and exchange of warnings is greatly facilitated by the adoption of a common technical standard,

Considering that the Common Alerting Protocol (CAP) standard has been identified as the best and most appropriate mechanism for WMO Members to use to facilitate the communication of all warnings,

Having considered the need of Regional Association I (Africa) (RA I) to enhance its participation in the mechanisms and standards approved by Congress for the international exchange of weather forecasts and warnings,

Convinced that WMO needs to increase efforts to ensure that all Members have the capability to issue and exchange their warnings via CAP so that these warnings are visible and available to all users,

Recognizing that CAP Jump Start workshops and other training events are important because they allow Members to become familiar with and generate warnings via CAP,

Decides:

(1) To support Members as necessary in order for them to adopt and operationalize the use of the CAP standard for coding alerts, including the provision of warning feeds to the Filtered Alert Hub (prototype for the WMO Alert Hub in support of the Global Multi-hazard Alert System (GMAS));

(2) To endorse the recommendation from the Regional Conference of RA I-17 (RECO-17) to mobilize resources to support training on and the implementation of CAP in RA I, thus facilitating the implementation of GMAS Africa;

(3) To ensure that all Members nominate focal points to edit, and keep updated, the Register of WMO Members Alerting Authorities of their national register pages;

Requests the Secretary-General to allocate resources within available budgets for further training and capacity development initiatives aimed at increasing the number of RA I Members using CAP for the dissemination and international exchange of warnings.
Resolution 3 (RA I-17)

Consolidation of severe weather forecasting and contribution to the enhancement of data processing, forecasting and applications in Regional Association I

REGIONAL ASSOCIATION I (AFRICA),

Recalling Resolution 1 (EC-70) – Consolidated approach to severe weather forecasting, which decided:

(1) To conduct a joint independent review of the Severe Weather Forecasting Demonstration Project (SWFDP), Flash Flood Guidance System and Coastal Inundation Forecasting Demonstration Project,

(2) To develop a consolidated approach to these projects for consideration by the Eighteenth World Meteorological Congress,

Recalling further:

(1) Resolution 11 (Cg-17) – Towards a future enhanced integrated and seamless Data-processing and Forecasting System, through which the Executive Council (EC) initiated a process for the gradual establishment of an enhanced integrated and seamless WMO Data-processing and Forecasting System,

(2) Decision 55 (EC-68) – Implementation of the seamless Data-processing and Forecasting System, through which EC established the Steering Group on the Seamless Global Data-processing and Forecasting System (GDPFS) to address the implementation of Resolution 11 (Cg-17),

(3) Recommendation 15 (EC-70) – Seamless Global Data-processing and Forecasting System Implementation Plan, which endorsed the overall approach of the EC Steering Group on the Seamless GDPFS, and urged Members to provide comments on the draft Implementation Plan for the Seamless GDPFS,

Noting the progress made in the implementation of the SWFDP in West Africa through two technical planning and training workshops (Dakar and Abidjan, November 2015 and September 2017, respectively) and a regional training on severe weather forecasting and warning services (Lomé, November 2018),

Noting further with appreciation that the SWFDP in West Africa has moved to the demonstration phase with the involvement of 15 National Meteorological and Hydrological Services (NMHSs) in the subregion,

Considering the paradigm shift into impact-based forecasting and warning services (IBF&WS) and the demonstrated ability of South Africa in this area,

Acknowledging that an SWFDP database has been developed by WMO as a convenient mechanism to facilitate online reporting on the progress of the project, including on forecast verification and clients’ feedback and that the mechanism is already in use by the NMHSs of East Africa,

Having considered the recommendation of the Directors General of Meteorology of the Central African States during a side meeting at the first Economic Community of Central African States (ECCAS) Hydromet Forum (Libreville, 14–16 November 2018) to implement, as a matter of priority, the SWFDP in Central Africa,

Noting that the Secretary-General has already circulated the draft Implementation Plan for the Seamless GDPFS to Members to provide their suggestions and comments on the draft implementation plan,
Decides:

(1) To endorse the recommendation from the Regional Conference of Regional Association I (Africa) (RA I)-17 (RECO-17) to request global and regional centres to make available numerical weather prediction data to facilitate the development of a limited area model by NMHSs;

(2) To task the RA I Management Group:

   (a) To closely follow the work related to the full review of SWFDP, to provide RA I with comments and support and, consequently, to develop a strategy for full SWFDP sustainability in RA I;

   (b) To identify a subregional entity in West Africa to oversee SWFDP for West Africa once the Project moves to the operational phase;

   (c) To nominate a regional focal point for the implementation of the seamless GDPFS and to ensure that the seamless GDPFS is considered in the regional workplan;

   (d) To identify one or two pilot projects in RA I for hosting, linking research and operations and demonstrating the seamless GDPFS capability. Potential areas for consideration could include advances in hydrological services, regional and urban air quality forecasting, high-resolution climate sensitivity assessment, agricultural services and severe weather forecasting;

(3) To endorse the recommendation of the Directors General of Meteorology of the Central African States at the first ECCAS Hydromet Forum to ensure the implementation of the SWFDP in Central Africa as a priority;

Requests the participating NMHSs to follow the guidelines for implementation of the SWFDP, in particular to provide regular reports through the SWFDP database;

Requests the contributing global centres and the Regional Specialized Meteorological Centres (RSMCs) and Regional Forecast Support Centres to continue providing support to the SWFDP in the operational phase;

Requests the NMHSs using World Meteorological Centre (WMC) and/or RSMC outputs to provide regular feedback on the performance of their products and services to ensure continuous improvement of the overall GDPFS;

Requests South Africa to help facilitate the IBF&WS implementation in other NMHSs in RA I;

Requests the Secretary-General:

(1) To facilitate the implementation of the SWFDP throughout Africa by the Nineteenth World Meteorological Congress, targeting next the Central African subregion, while considering the decision of the Eighteenth World Meteorological Congress on the way forward in the implementation of WMO demonstration projects;

(2) To take appropriate action for organizing an RA I Workshop on Seamless GDPFS requirements and implementation.
Resolution 4 (RA I-17)

Improving aeronautical meteorological service provision in Regional Association I

REGIONAL ASSOCIATION I (AFRICA),

Recalling Resolution 2 (RA I-16) – Further development of meteorological service provision to civil aviation in Region I (Africa), which, inter alia, requested the organizing of a regional conference to explore coordinated regional approaches in Region I in response to the evolving air traffic management system and information-centric requirements, based on the outcomes of a conjoint International Civil Aviation Organization (ICAO)/WMO meteorology divisional meeting in 2014,

Noting with satisfaction the conducting of a WMO Regional Association I (Africa) African Conference on Meteorology for Aviation (ACMA-2018) in Saly Portudal, Senegal, from 28 to 30 November 2018, and the availability of a conference website providing all of the technical presentation materials relating to the conference,

Appreciating the tremendous support given by the Agency for Aerial Navigation and Safety in Africa and Madagascar and the Agency of Civil Aviation and Meteorology of Senegal in hosting ACMA-2018, as well as the key contributions made by Members of Regional Association I (Africa) (RA I), the acting president of RA I, the president of the Commission for Aeronautical Meteorology (CAeM), ICAO and other stakeholders,

Having examined the executive summary and the recommendations and statement of ACMA-2018,

Observing the relevance to Members of RA I of the outcomes of:

(1) A CAeM global survey on aeronautical meteorological service provision conducted in 2016/2017 (WMO AeM SERIES No. 1),

(2) A CAeM/Commission for Atmospheric Sciences (CAS)/Commission for Basic Systems (CBS) aeronautical meteorology scientific conference held in 2017 (WMO AeM SERIES No. 2),

(3) The sixteenth session of CAeM held in 2018 (Commission for Aeronautical Meteorology: Abridged Final Report of the Sixteenth Session (WMO-No. 1222)),

Decides to endorse the ACMA-2018 recommendations and statement;

Requests the president of RA I, in coordination with the Management Group of RA I:

(1) To take into account the outcomes of ACMA-2018, as well as the outcomes of other recent relevant events, including the sixteenth session of CAeM, in the determination of the aeronautical meteorology-related activities and priorities in the region;

(2) To consider the need to establish or repurpose regional working groups (or other mechanisms) with appropriate terms of reference to further promote the implementation of aeronautical meteorology services in the region;

(3) To encourage permanent representatives to nominate the personnel assigned to working groups, in case the incumbent retires, has resigned or is assigned to a different portfolio, to ensure continuity and to be able to provide feedback and keep ICAO updated on the progress on emerging issues affecting aviation service delivery;
Urges Members of RA I, with the assistance of the presidents of RA I and CAeM, as necessary, to apply the outcomes of ACMA-2018 at the national level with a view to overcoming challenges and maximizing opportunities in the supply of meteorological services for international air navigation within RA I;

Requests the Secretary-General:

(1) To make necessary resources available to assist those Members most in need of improving their aeronautical meteorological services;

(2) To ensure that ICAO and other relevant stakeholders are kept informed of Members’ progress in RA I in responding to the emerging African aviation environment through enhanced regional coordination and cooperation.

Note: This resolution replaces Resolution 2 (RA I-16), which is no longer in force.

Resolution 5 (RA I-17)

Improving marine meteorology service provision in Regional Association I

REGIONAL ASSOCIATION I (AFRICA),

Acknowledging that Regional Association I (RA I) includes 38 countries with a coastline; consists of an exclusive economic zone; relies heavily on maritime trade, public transport (for example, by ferry) and fishing; contains recreational spaces; and has limited human capacity in the provision of coastal and marine services,

Acknowledging further that the world is currently responding to a call to focus on the oceans through the United Nations Sustainable Development Goals and the upcoming United Nations Decade of Ocean Science for Sustainable Development,

Recalling that the Seventeenth World Meteorological Congress, in 2015, urged Members to renew their focus on marine services by strengthening their marine meteorological and oceanographic services in support of safety, life and property at sea as required under the International Convention for the Safety of Life at Sea (SOLAS),

Recalling further Resolution 5 (JCOMM-5) – Management Committee of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology; Resolution 8 (JCOMM-5) – Services and forecasting systems programme area; Decision 16 (JCOMM-5) – Approval of the services and forecasting systems programme area vision, new structure and governance; Decision 40 (JCOMM-5) – Workplan and resources for the fifth session of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology; and Resolution 6 (Cg-17) – Competence requirements for marine weather forecasters,

Taking note of the Marine Services Assessment Report (submitted to the WMO Secretariat in March 2017 by an ad hoc working group) and the summary recommendations for improving the roll-out of marine and coastal services to WMO Members (see the annex to the present resolution and EC-70/INF. 5.3(2)),

Having considered Decision 16 (JCOMM-5) – Approval of the Services and Forecasting Systems Programme Area Vision, new structure and governance,

Recognizing the role of the International Maritime Organization (IMO)/WMO Worldwide Met-ocean Information and Warning Service (WWMIWS) and the associated Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) WWMIWS Committee (comprising all METAREA coordinators, one of whom is from RA I (South Africa)) in coordinating
and improving the delivery of services in accordance with IMO/WMO service regulations (Resolution 8 (JCOMM-5), and its annex – Terms of reference and general membership of the coordination group and teams of the services and forecasting systems programme area),

**Recognizing also** the importance of building capacity in marine and coastal services and the request by the RA I Management Group (June 2018) to establish a marine working group with one representative each from the Regional Economic Communities or geographic subregions,

**Recognizing further** that the RA I Management Group (June 2018) requested for RA I the identification of priority marine and coastal services and the nomination of national marine service focal points and resolved to form a task team that would deal with marine services in view of the non-existence of a marine cost-recovery framework,

**Taking note** that many RA I Members participated in the global marine services survey administered by WMO (closed 31 December 2018), the results of which will help to identify gaps and priority marine and coastal service needs in RA I,


**Recalling further** Resolution 26 (EC-70) – Amendments to the *Manual on the Global Data-processing and Forecasting System* (WMO-No. 485), approving the amendments to this Manual, and in particular, the formal designation of centres as Regional Specialized Meteorological Centres (RSMCs) for numerical ocean wave prediction and marine meteorological services,

**Noting** the decision by the IMO Maritime Safety Committee at its ninety-third session to mandate the implementation of the IMO Instruments Code for Coastal States from 1 January 2016, as stated in IMO Resolution A.1070 (28), where met-ocean forecasting requirements under the SOLAS Convention will be part of the IMO Member State Audit Scheme for every country,

**Recalling** Resolution 6 (Cg-17) – Competence requirements for marine weather forecasters,

**Noting** Resolution 11 (EC-70) – Marine and coastal services support for WMO Members, regarding:

1. A target date of 2023 to ensure all marine forecasters involved in producing WWMIWS products are competent,
2. The JCOMM co-president (WMO) consulting with presidents of regional associations to improve working relationships between JCOMM and regional association working groups on marine services,
3. The Secretary-General enabling improved communication to Members through their national marine services focal points,

**Considering** the formation, at the fifth session of JCOMM, of a new JCOMM Expert Team on Disaster Risk Reduction focusing, in part, on multi-hazard early warning systems and on the need to enable the development of new operational capacity, specialized training and effective outreach and mitigation of disasters in the coastal zone (from both ocean and river sources),

**Decides:**

1. To encourage RA I Members to send nominations for national marine services focal points, if they have not already done so;
2. To encourage Members with wave and ocean modelling capability to apply to become a wave and/or ocean model RSMC;
(3) To encourage Members interested in accessing marine-related RSMC standard products to consult the catalogue for the WMO Information System;

(4) To identify Members requiring assistance to prepare for the IMO Member State Audit Scheme on met-ocean services for the SOLAS Convention and to request assistance from the JCOMM co-presidents;

(5) To encourage RA I Members to implement the recently revised (2018) Manual on Marine Meteorological Services (WMO-No. 558) and associated Guide to Marine Meteorological Services (WMO-No. 471);

(6) To align the RA I operational plan to the WMO key performance indicators relevant to marine and coastal services and the JCOMM services vision and strategy (2017);

(7) To work with WMO to identify educational content on coastal hazards, and related to this, to endorse the WMO concept proposal for RA I, as contained in the annex to the present resolution, for developing a video targeted at coastal communities, explaining coastal flooding and storm surge and what to do during an event as a way to inform vulnerable communities in the African regions about the dangers of coastal flooding;

(8) To prioritize training needs in coastal inundation and marine services and advise the WMO Secretariat and the JCOMM co-president;

(9) To add an item to the RA I workplan to ensure that Members responsible for issuing products for the IMO/WMO WWMIWS, comprising Cabo Verde, Mauritius, Senegal and South Africa in RA I, have all their marine forecasters competent by 2023;

(10) To task the RA-I Management Group with defining priorities and terms of reference for the Working Group on Marine Meteorological Services and Cost Recovery;

Requests the Secretary-General:

(1) To facilitate improved access to ocean forecasting products, especially for search and rescue services required of those party to the SOLAS Convention, and subsequent capacity development for marine and coastal services, including training on relevant instrumentation and improved training for port meteorological officers and in the Voluntary Observing Ships Programme of JCOMM;

(2) To facilitate enhancing marine services capabilities using the newly developed marine competency guidelines to help advance marine services in RA I;

Requests the JCOMM co-presidents to ensure that relevant JCOMM activities are conducted by expert teams, or as appropriate, for RA I;

Requests the Secretariat to work with the above-mentioned RA I Working Group to assess gaps and strengths in marine services in order to inform priority workplans for marine activities.

Annex to Resolution 5 (RA I-17)

WMO concept proposal for RA I (2019)

Storm surge and coastal flooding awareness video
WMO Marine Meteorology and Oceanography Programme is working towards raising the awareness of the dangers of coastal inundation, in particular from storm surge during cyclonic or storm events, which commonly cause fatalities across coastal countries in RA I. In the event of coastal flooding, few people realize what to do to escape one, before it arrives.

WMO recommends the creation of a video specifically targeted to RA I coastal communities, explaining coastal flooding and storm surge, and what to do during an event, as a way to inform about the dangers of coastal flooding. An example of a video ‘Storm Surge Fast Draw’ produced by the US Government’s National Weather Service is at the following link in Youtube – https://www.youtube.com/watch?v=bBa9bVYKLP0&feature=youtu.be.

A similar video tailored to the African needs could be aired on the television regularly (similar to TV ads), shown in schools, and as well, could be shown in community or religious meetings in villages. Some areas will not have access to television (or electricity), therefore other relevant forms of communication material (e.g. hard copy) would be needed to supplement the video.

WMO is seeking RA I endorsement for this Video Proposal, and as well funding support from donors to create the video, and translate into local languages across RA I.

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**Resolution 6 (RA I-17)**

Regional approach for implementation of a Climate Services Information System

REGIONAL ASSOCIATION I (AFRICA),

Recalling:

1. Resolution 17 (Cg-XVI) – Implementation of the Climate Services Information System,
2. Decision 15 (EC-69) – Strengthening regional- and global-scale Climate Services Information System operations,
3. Decision 17 (EC-69) – National implementation of the Climate Services Information System,
4. Decision 18 (EC-69) – Sub-seasonal and seasonal forecasting systems,
5. Resolution 60 (Cg-17) – WMO policy for the international exchange of climate data and products to support the implementation of the Global Framework for Climate Services,
6. Resolution 5 (EC-70) – Recommendations of the Commission for Climatology at its seventeenth session,

Recalling further the discussions and outcomes of the meetings of the presidents of regional associations and the presidents of technical commissions in 2017 and 2018 (see RA I-17/INF. 3.2.1(1) for more information), with a special focus on the mechanism for WMO contributions to the Global Framework for Climate Services (GFCS) and the associated assessments of the status of climate services implementation in each regional association based on checklists completed by Members,

Noting with satisfaction:

1. That a draft Climate Services Information System (CSIS) technical reference document that reflects the CSIS elements and mechanisms, as well as the functions of CSIS entities at the global, regional and national levels, has been developed by the Commission for Climatology (CCI),
(2) That a Climate Services Toolkit prototype has been developed based on available resources, agreed standards and good practices to support CSIS activities,

(3) That the basic CSIS global and regional entities, such as Global Producing Centres for Long-range Forecasting (GPCs-LRF) and Regional Climate Centres (RCCs), are in place supporting the National Meteorological and Hydrological Services (NMHSs) in Regional Association I (Africa) (RA I), enabling development of operational climate products and services by Members in the region,

(4) The pioneering work of RA I in developing and sustaining Regional Climate Outlook Forums (RCOFs) as effective platforms to facilitate subregional cooperation and user engagement,

Noting further the recommendations of the WMO International Workshop on Global Review of Regional Climate Outlook Forums, held in 2017, including, inter alia, enhancement of RCOF products and expansion of the RCOF products portfolio,

Acknowledging that regional and global-scale CSIS operations require compliance with the WMO Integrated Global Observing System and WMO Information System regulations and alignment with seamless Global Data-processing and Forecasting System (GDPFS) principles,

Recognizing:

(1) That additional efforts are needed to achieve full and effective coverage of all subregions in RA I by fully functional and sustained RCCs and RCOFs,

(2) That a focus on CSIS operationalization at regional and national levels will help enhance the human and technical resources and institutional capacities of NMHSs in RA I in order to enable them to provide improved products and services for decision-making in climate-sensitive contexts through an effective and sustained CSIS operational mechanism at the national level,

Mindful of the core CSIS functions covering the past, present and future climate involving data and products related to observations, monitoring, sub-seasonal to decadal predictions and projections,

Decides:

(1) To adopt a regional approach to CSIS implementation as the overarching operational vehicle to support the development of climate services in RA I, with the following key elements:

(a) Subregional focus on seven domains, namely, Central Africa, Greater Horn of Africa, Gulf of Guinea, North Africa, south-west Indian Ocean, southern Africa and Sudano-Sahelian Africa;

(b) RCCs and RCC networks (both those designated and those under development) in respective subregions, with pan-African coordination support by RCC Africa, having overarching responsibility for regional data coherence and regionally optimized and enhanced climate monitoring, prediction and projection products from global inputs, for their respective domains;

(c) Members, along with NMHSs and other national stakeholders, focusing on demand identification, continuous observations, data rescue and management, calibration and tailoring of climate products for decision-making, interaction with and feedback from users, and documentation of socioeconomic benefits;

(d) Regular operational exchange, among global as well as RA I CSIS entities, of the necessary data and products;
(e) Optimization of seasonal forecasting skills, including through empirical bias correction and tailoring processes, as a means of providing users with reliable forecasts of variables closely associated with user outcomes, accompanied by information on forecast skill;

(2) To expand RCOFs and complementary mechanisms in the region beyond seasonal outlooks and to set out to evolve them into Regional Climate Forums (RCFs), focusing on effective coordination at the regional and subregional levels for operational delivery to Members of a variety of products in support of a wider range of country-level services required by different sectors (for example, agriculture and food security, water resources, and so forth);

(3) To support the leveraging of extra-budgetary resources through ongoing projects for CSIS regional implementation;

Urges Members:

(1) To expedite the designation of CSIS national focal points;

(2) To complete and regularly update climate services checklists to enable the systematic documentation of baseline capacities, the identification of priority needs and the monitoring of the effectiveness of ongoing capacity development efforts;

(3) To develop both short-term and long-term tangible action plans for CSIS implementation at the national level, including measures to systematically build on the capacities identified in the checklist, targeting national adaptation and climate services priorities with tailored products co-designed with stakeholders;

(4) To develop and sustain National Climate Forums in order to ensure more flexibility in dealing with national requirements for climate information and in order to facilitate dialogue for the co-design of tailored climate information, including climate data, monitoring, predictions and projections;

(5) To operationally exchange and actively utilize climate products and services provided through CSIS in order to support data exchange in accordance with Resolution 60 (Cg-17);

(6) To ensure that the various organizational frameworks, while being in line with their national legislation, further align with Resolution 60 (Cg–17) with respect to data exchange to support GFCS;

Urges RCCs and RCC networks (both those designated and those under development) to provide technical coordination on an ongoing basis for the implementation and operation of CSIS in their respective domains, including the required liaison with global CSIS entities such as GPCs-LRF, the Copernicus Climate Change Service, WMO Regional Training Centres, RA I working groups and experts from WMO technical commissions and programmes, including co-sponsored programmes;

Requests the RA I subsidiary body responsible for climate services:

(1) To develop an action plan for the implementation of CSIS at the regional level in close coordination with the relevant CCI bodies and RCCs and RCC networks, incorporating RCFs as vehicles for organizing operational systems supporting national-level delivery of priority climate services;

(2) To liaise with the African Centre of Meteorological Applications for Development and WMO for monitoring the regularity and timeliness of the provision of the annual Statement on the State of Climate in Africa and to advise on aligning this publication, to the extent possible, with the WMO practices for the provision of the annual Statement on the State of the Global Climate, particularly with respect to the methodologies and data used for assessing key climate indicators, such as temperature, greenhouse gases, precipitation,
sea level, and the format for presenting information on high-impact events, including major
droughts, extreme precipitation, floods, tropical cyclones, sand and dust storms, wildfires
and others;

(3) To provide guidance to NMHSs in optimally utilizing global and regional CSIS products to
develop and enhance climate services at the national scale;

(4) To support Members in developing countries in preparing action plans for CSIS
implementation at the national level, including through relevant linkages with the RCCs and
RCC networks concerned;

Invites the acting president of RA I to work closely with the presidents of RA II (Asia) and
RA VI (Europe) to facilitate the well-coordinated implementation of CSIS in the cross-regional
domains of the Arab and Mediterranean regions, respectively, as joint activities;

Requests the Secretary-General to facilitate periodic audits, under the guidance of CCI and the
Commission for Basic Systems, of the climate services capacities and operations in the region
and to promote adherence to the applicable ISO quality management guidelines.

Resolution 7 (RA I-17)
Enhancing the development and application of climate services
for adaptation and policy support

REGIONAL ASSOCIATION I (AFRICA),

Recalling:

(1) Resolution 48 (Cg-XVI) – Implementation of the Global Framework for Climate Services,

(2) Resolution 1 (Cg-Ext.(2012)) – Implementation Plan of the Global Framework for Climate
Services,

Recalling further:

Climate Services (GFCS) in Africa (September 2012),

(2) The Benoni Statement on the Global Framework for Climate Services in Africa (September
2014),

(3) Article 7 of the Paris Agreement, which calls for the need to strengthen scientific
knowledge to enhance adaptive capacity, strengthen resilience and reduce vulnerability
to climate change through adaptation action that is country-driven, gender-responsive,
participatory and fully transparent, with a view to contributing to sustainable development,

(4) That the Conference of the Parties serving as the meeting of the Parties to the Paris
Agreement, at its first session (CMA1), with a view to facilitating the development and
application of methodologies for assessing adaptation needs, invited WMO, through
its Global Framework for Climate Services, to regularly inform the Subsidiary Body for
Scientific and Technological Advice about its activities aimed at improving the availability
and accessibility of comprehensive climate information, including observational data, and
about how it facilitates the provision and dissemination of the most up-to-date climate
model predictions and projections,
Recognizing that GFCS was established to enable better management of the risks of climate variability and change and adaptation to climate change through the development and application of science-based climate information and services in support of decision-making in the climate-sensitive sectors of agriculture and food security, disaster risk reduction, energy, health, and water resources management,

Recognizing further:

(1) That significant improvements in adaptation outcomes and policy formulations can be realized through enhanced coordination and alignment of efforts at the global, regional and national levels, leading to the development of high-quality and customized climate information and services and their effective application,

(2) That the development of high-quality and customized climate services requires systematic interaction between providers and users of climate information and services, as well as relevant stakeholders from institutions that have a role to play in the climate services value chain at the global, regional and national levels,

(3) That GFCS directly contributes to the achievement of global and national goals identified in major policy frameworks such as the Sendai Framework for Disaster Risk Reduction 2015–2030, the United Nations 2030 Agenda for Sustainable Development, the Small Island Developing States Accelerated Modalities of Action Pathway, among others, many of whose targets are weather- and climate-sensitive and as such, would benefit from the use of high-quality and customized climate services,

Mindful that:

(1) The increasing socioeconomic and environmental impacts from extreme weather and climate events have led to the rise in importance of climate on the international agenda and the need for an increase in climate-related activities and financing, as these are currently characterized by a lack of governing and coordination structures for aligning climate action efforts among stakeholders, which has led to fragmentary and piecemeal policy implementation,

(2) The continuation and expansion of climate-related investment will depend on the continuous assessment and documentation of the associated socioeconomic benefits,

Decides:

(1) To implement National Frameworks for Climate Services (NFCSs), which provide the institutional mechanism to coordinate, facilitate and strengthen collaboration among national institutions and other stakeholders to improve the co-production, customization, delivery and use of science-based climate services, making use of the Step-by-step Guidelines for Establishing a National Framework for Climate Services (WMO-No. 1206), available in all WMO languages;

(2) To implement Regional Frameworks for Climate Services (RFCSs) to facilitate the identification of common needs to inform the priorities for investment in the elements of the climate services value chain at the regional level;

(3) To use NFCSs to contribute more effectively and holistically to incorporating adaptation and mitigation activities at the national level, through the provision of science-based evidence and driven by high-quality data analysis and products, into national adaption plan processes, to implementing nationally determined contributions priorities and other relevant national policy and development agendas, and to carrying out the routine assessment and documentation of the socioeconomic benefits of climate services implemented to further the achievement of such national plans and priorities;
**Urges** Members:

(1) To make use of national and regional institutions and capabilities to ensure that there is effective support of the development and implementation of the various elements of the climate services value chain;

(2) To tap into funding streams available to national and regional institutions to facilitate the financing of the activities of NFCSs and RFCSs;

(3) To share experiences and good practices in the development and implementation of NFCSs and RFCSs;

**Invites** United Nations organizations, as well as other relevant regional and international organizations, whether governmental or non-governmental, to support the implementation of GFCS by participating in and contributing to supporting the activities of NFCSs and RFCSs;

**Requests** the Secretary-General:

(1) To support the engagement of National Meteorological and Hydrological Services in NFCSs and RFCSs in support of climate action;

(2) To bring this resolution to the attention of all concerned.

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**Resolution 8 (RA I-17)**

Data rescue for recovering millions of African climate data records archived on obsolete microfiches

REGIONAL ASSOCIATION I (Africa),

**Recalling:**

(1) Resolution 16 (Cg-XVI) – Climate data requirements,

(2) The Implementation Plan of the Global Framework for Climate Services (2014), which includes data rescue as a priority activity,

(3) Resolution 60 (Cg-17) – WMO policy for the international exchange of climate data and products to support the implementation of the Global Framework for Climate Services,

(4) Decision 19 (EC 69) – International Data-rescue Initiative,

(5) Resolution 16 (Cg-17) – Report of the sixteenth session of the Commission for Climatology,

**Mindful** of the successful African Data Rescue (DARE) project, which was initiated in the 1980s with the support of the Belgian Government and imaged millions of data records using the microfiche technology available at that time,

**Recognizing** the high value of these archives for documenting past climate, assessing climate change and underpinning climate research and applications,

**Recognizing further** that these microfiches do not adequately enable data access and that this technology no longer constitutes an adequate or safe way for archiving such high-value records, putting them at high risk for loss and/or degradation,
**APPENDIX 2. RESOLUTIONS ADOPTED BY THE SESSION**

**Resolution 9 (RA I-17)**

*Enhancing provision and exchange of selected climate datasets*

**Regional Association I (Africa),**

**Recalling:**

(1) Resolution 60 (Cg-17) – WMO policy for the international exchange of climate data and products to support the implementation of the Global Framework for Climate Services,

(2) Resolution 14 (EC-64) – Submission of World Weather Records on an annual basis,

(3) Resolution 16 (Cg-17) – Report of the sixteenth session of the Commission for Climatology,

**Mindful** of the need to increase the availability of World Weather Record (WWR) datasets for operational climate monitoring on an operational basis, including at monthly and annual timescales,
Recognizing:

(1) The high value of the WMO mandatory publication containing climatological standard normals (CLINOs) and the status of this publication as an authoritative source for climate data averages being used worldwide for climate monitoring, assessment and other applications,

(2) That the most recent compilation of global climate normals covers the period from 1961 to 1990 (Climatological Normals (CLINO) for the period 1961–1990 (WMO-No. 847), published in 1996) and that there is a need to update this publication with datasets to reflect current climate conditions, which have significantly changed since the last version was published,

Noting:

(1) The changes in the procedures for submission of WWRs from a 10-year reporting schedule to yearly submissions (Resolution 14 (EC-64)) and the subsequent annual invitations by the Secretary-General to Members for submitting annual WWR updates,

(2) The amendments to the WMO Technical Regulations to reflect the new approach for the calculation and submission of CLINOs as recommended by the Commission for Climatology (CCl) and approved by the Seventeenth World Meteorological Congress in Resolution 16 (Cg-17),

(3) The letter of the Secretary-General on 1 August 2018 inviting Members to submit CLINOs for the period 1981–2010,

Appreciating the efforts by the World Data Center for Meteorology, hosted by the National Centers for Environmental Information of the National Oceanic and Atmospheric Administration, United States of America, and the Commission for Basic Systems (CBS) Lead Centres for the Global Climate Observing System (GCOS) for the collection, updating and management of WWRs and CLINOs,

Welcoming the excellent collaboration including between CCl, CBS and the Secretariat in providing guidelines for the submission of WWRs and for the calculation and provision of CLINOs,

Concerned about the gaps in the submission of WWRs across the Africa region,

Urges Members:

(1) To enhance their collaboration for submitting WWRs annually, as explained in the guidelines, and to fill in the gaps since 2011, as appropriate;

(2) To contribute enthusiastically to the submission and collection of CLINOs for the period 1981–2010;

Requests Regional Association I (Africa) subsidiary bodies responsible for data management:

(1) To advise on ways and mechanisms for enhancing communication on the importance of data exchange in general and the provision of WWRs and CLINOs in particular;

(2) To liaise with CBS Lead Centres for GCOS on the progress made in the status of WWRs and CLINOs that are submitted from the region;

Requests the Secretary-General to facilitate online access to the global database of WWRs and CLINOs for use by the National Meteorological and Hydrological Services and Regional Climate Centres in their climate activities.
Resolution 10 (RA I-17)
Regional hydrological priorities

REGIONAL ASSOCIATION I (AFRICA),

Recalling


(2) The *Conference Statement* of the WMO Global Conference: Prosperity through Hydrological Services, held in Geneva from 7 to 9 May 2018,

(3) The reports of the eleventh and twelfth sessions of the Regional Association I (Africa) (RA I) Working Group on Hydrology (WG-H), held in Accra in November 2015 and Abuja in November 2018, respectively,

(4) Resolution 21 (Cg-XV) – Strategy for the enhancement of cooperation between National Meteorological and National Hydrological Services for improved flood forecasting,

(5) Resolution 6 (CHy-15) – The Flood Forecasting Initiative and the contribution of the Commission for Hydrology to the Disaster Risk Management Programme,

(6) Resolution 18 (EC-70) — Outcomes of the special dialogue on water, and Recommendation 25 (EC-70) — WMO technical commissions and other bodies,

Noting that the Commission for Hydrology (CHy) is currently undertaking several initiatives of relevance to RA I activities related to hydrology and water management, including the implementation of the Global Hydrometry Support Facility (HydroHub) to foster coordination and innovation in support of hydrological observation and data exchange; the implementation of phase II of the WMO Hydrological Observing System (WHOS); the establishment of a Global Hydrological Status and Outlook System (HydroSOS), including a pilot project in the Lake Victoria region, with the aim of developing WMO capability to assess the current and future global status of water availability; the implementation strategy for End-to-End Early Warning Systems (E2E EWS) for flood forecasting (using the Community of Practice approach); and the launch of phase II of the World Water Data Initiative, originally developed in the framework of the High-level Panel on Water under the leadership of Australia, which was handed over to WMO during the seventieth session of the Executive Council to lead its future implementation,

Noting also the increased importance being placed on the availability of water resources within a country, basin and region for sustainable development, and the need to have clear and accurate indications of existing and future availability of water resources for planning purposes, as well as the requirement for reliable hydrological data to support the achievement of the United Nations Sustainable Development Goals, especially Goal 6 on water and sanitation,

Noting further that in the framework of the development and implementation of the methodologies for monitoring the indicators for Goal 6 of the United Nations Sustainable Development Goals, under the guidance of UN-Water, a number of pilot projects have been implemented in the region (Botswana, Cameroon, Chad, Egypt, Ghana, Kenya, Rwanda, Senegal and Uganda) through national multidisciplinary teams in which National Hydrological Services (NHSs) were involved,

Noting with concern the present condition of the hydrological observing networks and their operations and maintenance in many RA I countries, and the difficulties encountered in promoting decision-makers’ awareness on their importance,

Recognizing the need to foster cooperation between meteorology and hydrology to improve the quality of the services provided,
Acknowledging:

(1) That one component of the Flash Flood Guidance System (FFGS) is currently operational in the region, specifically, the southern Africa Region, including Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa (Regional Centre), Zambia and Zimbabwe, and that a second FFGS is about to be initiated with the participation of Burkina Faso, Mali and Niger,

(2) That additional RA I Members could benefit from the application of the FFGS and the further development and application of riverine flood forecasting, urban flash flood forecasting and landslide susceptibility systems,

(3) The synergy between the workplans related to flood forecasting of CHy and the RA I WG-H, and the contribution of experts from the region to the Implementation Strategy for E2E EWS,

Welcoming the achievements of the RA I WG-H with respect to the development of a dedicated website for its members and other interested experts and the guidance provided for the implementation of the FFGS in the region,

Urges Members to ensure that the appointment of their national hydrological advisers is up to date and, when selecting national experts to participate in activities of the WG-H, to consider inviting expert representatives from academia and other national water-related institutions, in addition to the NHS, to participate in the WG-H activities, thereby broadening and strengthening hydrological representation in WMO hydrological activities;

Invites Members:

(1) To identify and communicate to the HydroHub Advisory Council, either directly or through the WG-H, needs and gaps in hydrological data collection, measuring technology, data interpretation tools and hydrological information systems that could be addressed by HydroHub and its components, such as the World Hydrological Cycle Observation System and WHOS;

(2) To take steps to ensure closer cooperation between meteorological and hydrological communities allowing the consequent design and implementation of end-to-end systems (measured data, models, forecasts, warning dissemination) for water resource assessment and management, as well as forecasting;

(3) To contribute to the identification and definition of products related to HydroSOS and to agree on regional provisions to ensure the sustained operability of HydroSOS into the future;

(4) To share, via their participation in the RA I WG-H, their best practices in data collection and management as well as flood forecasting and to provide contributions to the development of guidance material on how to best communicate forecasts and uncertainty in forecast products, especially to civil protection and disaster managers;

(5) To take steps to assess the need for enhancing their national flood forecasting capabilities and, in so doing, to strengthen cooperation between meteorological and hydrological communities, allowing for the consequent design and implementation of E2E EWS for flood forecasting;

(6) To continue participating in and supporting the development of the CHy Implementation Strategy for E2E EWS for flood forecasting (using the Community of Practice approach);

(7) To ensure that NHSs are involved in the national process for monitoring the United Nations Sustainable Development Goals, especially Goal 6 on water and sanitation, and to make certain that there are sufficient resources to ensure that there are effective quality data-collection mechanisms;
Decides:

(1) To increase the engagement of its Members in the CHy Implementation Strategy for E2E EWS for flood forecasting (using the Community of Practice approach), exploring possible avenues of cooperation to increase Member capabilities to provide early warnings of flooding;

(2) To participate in the effort of the Flood Forecasting Initiative to assess the flood forecasting capabilities of WMO Members by, for example, beginning to apply the assessment guidelines in the region, once they are completed;

(3) To increase the engagement of its Members in HydroHub activities, especially the launching of new Hydrological Cycle Observation System projects according to priorities, the implementation of WHOS phase II and the HydroHub Community of Practice;

(4) To increase the engagement of its Members in HydroSOS activities, especially through the pilot project on Lake Victoria;

Requests the WG-H to consolidate and extend, in the period 2019–2022, the activities initiated during the current period and to consider possible new areas of work, such as groundwater monitoring, availability of potable water on the basis of climate conditions and infrastructure management, sedimentology, spatial hydrometry (virtual stations) and distance learning courses;

Requests the Secretary-General to support capacity-building efforts, including communication, in all water-related professions, and to identify innovative funding mechanisms for NHSs to make the profession of hydrologist more attractive, especially for young professionals and women;

Requests the Congress to consider that the positioning of WMO in the global water agenda, particularly in relation to United Nations Sustainable Development Goal 6, as well as the strengthening of hydrology within WMO, require that the unique leading role of WMO in operational hydrology be recognized, and also that there be a diversity of actors in water issues, both at the country level and at the international organization level, which indicates that the structure of WMO should be explicit in relation to hydrology, allowing effective interaction with the various actors involved and offering mandated and competent guidance to Members on the issues of water and hydrology.

**Resolution 11 (RA I-17)**

**Regional WMO Integrated Global Observing System Implementation Plan 2019–2022**

**REGIONAL ASSOCIATION I (AFRICA),**

Recalling:

(1) Resolution 8 (RA I-16) – WMO Integrated Global Observing System Implementation Plan for Regional Association I (Africa),

(2) Resolution 23 (Cg-17) – Pre-operational phase of the WMO Integrated Global Observing System,

(3) Resolution 69 (Cg-17) – WMO Strategic Plan 2016–2019,

(4) Resolution 2 (EC-68) – Plan for the WMO Integrated Global Observing System pre-operational phase 2016–2019,
Noting:

(1) That the WMO Integrated Global Observing System (WIGOS), as a foundational element supporting all WMO priorities, can assist in improving the integrated operations of Members and in building productive partnerships that will benefit improving weather, climate, water and relevant environmental services,

(2) The critical role of WIGOS for the implementation of the Global Framework for Climate Services, weather and disaster risk reduction services, aviation meteorological services, polar and high-mountain regions, and capacity development,

(3) That a new draft Manual on the WMO Integrated Global Observing System (WMO-No. 1160) is being proposed to the Eighteenth World Meteorological Congress, including, inter alia, provisions for a critically needed Global Basic Observing Network (GBON), which will lead to substantially improved weather predictions and climate analysis products for Africa and thus further strengthen the Observation and Monitoring pillar of the Global Framework for Climate Services,

Adopts the updated Regional WMO Integrated Global Observing System Implementation Plan 2019–2022, as contained in the annex to the present resolution;

Requests its Management Group:

(1) To regularly review WIGOS implementation efforts in the Region;

(2) To oversee, guide and prioritize the activities listed in the Implementation Plan, to monitor the implementation progress and to submit updates to the Implementation Plan to the president of Regional Association I (Africa) (RA I) for approval;

(3) To facilitate and coordinate regional WIGOS projects;

(4) To coordinate the implementation of the Implementation Plan with RA I Members, to consult with the appropriate technical commissions on technical aspects of the implementation and to ensure that Members are kept informed;

(5) To provide regional support to Members in accordance with the Implementation Plan and in response to their requests (subject to the availability of resources and funds);

(6) To facilitate the establishment of the regional component of the GBON in RA I;

(7) To oversee the establishment of the Regional Basic Observing Network in RA I;

(8) To oversee the work of Regional WIGOS Centre pilots, when established;

(9) To support training on the Observing Systems Capability Analysis and Review tool (OSCAR)/Surface as a matter of great urgency;

Requests Members:

(1) To organize their activities so as to realize WIGOS goals and associated outcomes as described in the Implementation Plan;

(2) To continue to provide resources, including through the WIGOS Trust Fund and/or seconded experts, to help support the regional implementation of WIGOS;

(3) To support the establishment of Regional WIGOS Centres;

(4) To communicate and promote the benefits of WIGOS nationally;

(5) To actively promote the national implementation of WIGOS;
(6) To share experiences and lessons learned from the implementation of WIGOS and WIGOS-related documentation with other Members in RA I;

(7) To nominate their national WIGOS and OSCAR/Surface focal points if they have not already done so;

(8) To encourage the national focal points for WIGOS and OSCAR/Surface to actively support the integration of partner observing networks and stations in WIGOS, including those not owned by National Meteorological and Hydrological Services;

(9) To provide WIGOS implementation progress reports at the request of the RA I Management Group;

(10) To contribute to the implementation of the Regional Basic Observing Network;

(11) To contribute to the implementation of the regional component of the GBON in RA I;

Requests the Secretary-General to provide the necessary assistance and Secretariat support for the implementation of WIGOS in RA I;

Invites the partners to participate in relevant implementation activities as specified in the Implementation Plan.

Note: This resolution replaces Resolution 8 (RA I-16), which is no longer in force.
Annex to Resolution 11 (RA I-17)

Regional WIGOS Implementation Plan for Regional Association I (Africa)

WORLD METEOROLOGICAL ORGANIZATION

WMO INTEGRATED GLOBAL OBSERVING SYSTEM (WIGOS)

REGIONAL WIGOS IMPLEMENTATION PLAN
FOR
REGIONAL ASSOCIATION I (AFRICA)

(R-WIP-I)
Version 1.1
(10/01/2019)
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ANNEX 1 WIGOS Implementation Activities in Region I

LIST OF ACRONYMS
1. INTRODUCTION AND BACKGROUND

1.1 Purpose of WIGOS and Scope of the Regional WIGOS Implementation Plan for RA I (R-WIP-I)

The WMO Integrated Global Observing System (WIGOS) provides a framework for WMO observing systems and the contributions of WMO to co-sponsored observing systems. It is important to recognize that WIGOS is not replacing the existing observing systems, but is rather an over-arching framework for the evolution of these systems which will continue to be owned and operated by a diverse array of organizations and programmes. WIGOS focuses on the integration of governance and management functions, mechanisms and activities to be accomplished by contributing observing systems, according to the resources allocated on a global, regional and national level.

The WIGOS Framework Implementation Plan (WIP) addresses the necessary activities to establish an operational WIGOS by the end of the period 2012–2015, as per the direction of WMO Congress. Yet WIGOS continues to evolve and improve beyond 2015 through the governance and management mechanisms established by the execution of this plan.

The WIP provided a basis for the development of the Regional WIGOS Implementation Plans (R-WIP). The Members of the Region adhered to the global WIP and to their regional framework (R-WIP) in the design, operation, maintenance and evolution of their national observing systems.

This plan is laid out in several chapters that identify and describe the various activity areas to be addressed within this Region. Specific regional/national activities for each area are included in Table 2 (see Section 4), which identifies deliverables, timelines, responsibilities, costs and risks, and whether the activity requires regional and/or national implementation. Similar activities are grouped under the title corresponding to the respective sub-section of Section 2.

1.2 WIGOS Vision and Congress Guidance for WIGOS Implementation

The Seventeenth World Meteorological Congress (Cg-17) decided that the development of WIGOS, supported by WIS, as one of the WMO strategic priorities for 2016-2019, will continue during its pre-operational phase to build upon and add to those key building blocks of the WIGOS Framework that have already been implemented, while gradually shifting the emphasis from the global level toward implementation activities at the regional and national levels. The goal is to have Members and their partners benefit from a fully operational system from 2020 onward.

The highest priorities for the WIGOS Pre-operational Phase are: (1) National WIGOS implementation; (2) WIGOS Regulatory Material complemented with necessary guidance material to assist Members with the implementation of the WIGOS technical regulations; (3) Further development of the WIGOS Information Resource (WIR), with special emphasis on the operational deployment of the Observing Systems Capability Analysis and Review (OSCAR) databases; (4) Development and implementation of the WIGOS Data Quality Monitoring System; and (5) Concept development and initial establishment of Regional WIGOS Centres (RWCs).

Basic functions of the RWC will be regional coordination, guidance, oversight and support of WIGOS implementation and operational activities at the regional and national levels (day-to-day level of activities).

The Plan for the WIGOS Pre-operational Phase (PWPP) adopted by EC-68 has been guiding the development of WIGOS during the financial period, especially at the regional and national levels, and has been assisting in defining priorities and targets.

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1 See the WMO Strategic Plan (http://library.wmo.int/pmb_ged/wmo_1161_en.pdf)
Based on PWPP, and the draft Manual on WIGOS (WMO-No. 1160) prepared for submission to the Eighteenth World Meteorological Congress, R-WIP-I has been reviewed and updated considering the regional activities, needs, requirements and priorities.

2. **KEY ACTIVITY AREAS FOR REGIONAL WIGOS IMPLEMENTATION**

To migrate the existing global observing systems (the Global Observing System (GOS), the Global Atmosphere Watch (GAW), the World Hydrological Observing System (WHYOS) and the Global Cryosphere Watch (GCW), including surface-based and space-based components and all WMO contributions to GFCS, GCOS, GOOS, GTOS and GEOSS), particularly their regional components, into a more integrated single system that is WIGOS, focused effort is required at the regional level in the following key areas, detailed in the sub-chapters to follow:

(a) Management of WIGOS implementation;
(b) Collaboration with the WMO co-sponsored observing systems and international partner organizations ad programmes;
(c) Design, planning and optimized evolution of WIGOS component observing systems at regional, subregional and national levels;
(d) Observing System operation and maintenance;
(e) Quality Management;
(f) Standardization and interoperability;
(g) WIGOS Information Resource;
(h) Data delivery and archival (of Data and Metadata);
(i) Capacity development;
(j) Communication and outreach.

2.1 **Management of WIGOS implementation**

WIGOS implementation is an integrating activity for all regional components of the WMO and co-sponsored observing systems: it supports all WMO Programmes and activities.

**Executive Council**

The WMO Executive Council continues to monitor, guide, evaluate and support the overall implementation of WIGOS. Following the guidance by Cg-XVI, EC-LXIII established the Inter-Commission Coordination Group on WIGOS (ICG-WIGOS) with a view to providing technical guidance and assistance for the planning, implementation and further development of the WIGOS components. Progress on implementation of WIGOS will be reported to subsequent sessions of EC. The Council designated the president of CBS as chairperson of ICG-WIGOS.

**Regional Association**

The regional association plays the key role in WIGOS implementation in the Region. The regional association, through its Working Group on Observation, Telecommunication and Infrastructure (WG-OTI), coordinates planning and implementation of WIGOS on the regional
level taking into account all WMO future priorities, such as GFCS and DRR. The WG-OTI, under
guidance from ICG-WIGOS, and with the support, where required, of the WMO Secretariat, will
be responsible for:

(a) The further development of the Regional WIGOS Implementation Plan (R-WIP);
(b) The integration of WIGOS regional network components;
(c) The contribution to WIGOS regulatory material;
(d) The development of the regional WIGOS Data Quality Monitoring System;
(e) The support and assistance in using the OSCAR/Surface;
(f) The assistance in establishing and operation of Regional WIGOS Centres;
(g) The assistance in development of Aircraft-based Observations in the Region, including
the establishment of the Regional AMDAR Programme under the WMO-IATA Collaborative
AMDar Programme (AMDar) in the Region;
(h) The contribute to the coordination of radio-frequency protection in the region;
(i) The assistance and guidance to Members on Automatic Weather Station networks;
(j) The coordination of capacity development activities in the Region; and
(k) The evolution of their regional networks according to the implementation plan for the
evolution of global observing systems (EGOS-IP)\(^3\).

R-WIP also addresses regional aspects of requirements, standardization, observing system
interoperability, data compatibility, data and metadata management, Quality Management
System (QMS) procedures including performance monitoring and data quality monitoring, and
proposed improvements in observing networks/systems. An important role of the regional
association is to assess and continuously monitor regional requirements, identify regional gaps
and identify capacity development projects within the Region to address those gaps.

**The Members of the Region**

Members plan, implement, operate and maintain national networks and observing programmes
based on the standard and recommended practices and procedures stated in the WMO
Technical Regulations. They are encouraged to adopt a composite network approach and to
include the acquisition, and onward transmission, of data from external sources, including
NMHSs and other government agencies, the commercial sector and members of the public. A
particular area of focus for Members of the Region under WIGOS is increased attention to the
observing site and radio frequency spectrum protection.

Plans should also be developed to strengthen cooperation through partnership with different
owners overseeing the WIGOS observing components within their countries. Specifically,
these activities aim to enhance cooperation amongst meteorological, hydrological, marine/
oceanographic and academic/research institutions/services where they are separated at the
national level.

Concerning Radio Frequency Spectrum Protection, Members should maintain close coordination
with their national authorities to register their frequencies for adequate protection, and to
defend the availability of frequencies for Meteorology, Climatology and Earth observations,
influencing positively the national delegations to the World Radiocommunication Conferences
(WRC).

2.2 Collaboration with the WMO co-sponsored observing systems and international partner organizations and programmes

WIGOS is an integrated, comprehensive, and coordinated system primarily comprising the surface-based and space-based observing components of the GOS, GAW, GCW, and WHYOS, plus all WMO contributions to GCOS, GOOS and GTOS. It should be noted that in contrast to the primarily NMHS-owned observing systems upon which the WWW was built, the proposed WIGOS component observing systems are owned and operated by a diverse array of organizations, both research and operational. Therefore, the interaction between these various communities at the regional and national levels is important for the implementation of WIGOS within the Region. In particular, strengthening the interaction between research and operational observing communities is important for sustaining and evolving observing systems and practices, in line with new science and technology outcomes.

Partner Organizations

At the regional level, coordination and cooperation is supported by a mechanism to be defined by the regional association and the respective regional bodies, such as ASECNA, ACMAD, AGRHYMET, CICOS, SADC-CSC, ICPAC, PANGEA\(^4\), in order to resolve possible problems in data policy, product delivery and other governance issues. This interagency and inter-observing system coordination mechanism is needed to be complemented and supported through similar cooperation and coordination arrangements among NMHSs and through national implementation mechanisms for GFCS, GCOS, GOOS, GTOS, and GEOSS.

The Architecture for Climate Monitoring from Space has been defined as an end-to-end system, involving the different stakeholders including operational satellite operators and R&D space agencies, the Coordination Group for Meteorological Satellites (CGMS), the Committee on Earth Observation Satellites (CEOS), the Global Climate Observing System (GCOS), the World Climate Research Programme (WCRP) and the Group on Earth Observations (GEO). Within the regional context, the Architecture shall be part of the space-based component of WIGOS. Therefore, particular emphasis is placed on their coordinated contribution to WIGOS within the Region, building on existing coordination mechanisms stated above.

2.3 Design, Planning and Optimized Evolution of WIGOS component observing systems at regional, subregional and national levels

WMO agreed on the Vision for the Global Observing Systems in 2025\(^5\) which provides high-level goals to guide the evolution of the global observing systems during the coming decades. To complement and respond to this Vision, an Implementation Plan for the Evolution of Global Observing Systems (EGOS-IP) has been considered by CBS-15. This EGOS-IP focuses on the long-term evolution of WIGOS observing systems components, while the WIP focuses on the integration of these observing system components. Beyond 2015 these plans provide Members of the Region with clear and focused guidelines, specifying actions that stimulate the cost-effective evolution of the observing systems to address in an integrated way the requirements of all WMO Programmes and relevant parts of co-sponsored programmes.

Concerning the surface-based sub-system of WIGOS, the current composition of mainly separate networks of observing stations comprises numerous different types of sites. With the implementation of WIGOS, these separate networks will continue to evolve but will also be given a more prominent collective identity as the WIGOS surface-based sub-system and for some purposes may be considered as a single composite system of observing (fixed or mobile) sites/platforms. The regional association will adopt a broader role in coordinating the implementation of relevant elements of the WIGOS surface-based sub-system, evolving from the previous concepts of mainly the regional synoptic and climatological networks into an integrated concept of a WIGOS Regional Network.

Similarly, the space-based sub-system of WIGOS is composed of many different platforms and types of satellites. There is already partial integration due to the existence of a globally

\(^4\) Another key Partners and stakeholders can be considered

\(^5\) Available from the WMO Website at: [http://www.wmo.int/pages/prog/www/OSY/gos-vision.html](http://www.wmo.int/pages/prog/www/OSY/gos-vision.html)
coordinated plan, which is maintained by WMO and CGMS, and which takes into account the needs of a number of application areas. However, it should be further developed and expanded to better support certain application areas that, at present, are not benefiting from the full potential of space-based observations, for example, other components of GAW and WHYCOS and new initiatives like GFCS and GCW. In addition, further integration shall be pursued in terms of inter-calibration, data and product harmonization, and composite product delivery. The regional association will adopt an active role in compiling the views of Members and maintaining documented requirements and priorities for data and products to be available for the Region from the WIGOS space-based sub-system.

**Rolling Review of Requirements (RRR)**

Coordinated strategic planning at all levels is based on the RRR process, and is supported by the WIGOS regulatory material. This activity has been carried out primarily at the global level under the guidance of the ICG-WIGOS.

The RRR process involves regularly reviewing the observational data requirements for each of the defined WMO Application Areas and all required variables (see Table 1). The RRR process also involves reviewing the capabilities of WMO observing systems and co-sponsored systems, and the details of the networks/platforms in existence, for both space-based and surface-based systems, in delivering data on different variables. The comprehensive information collected for the globe on both requirements and capabilities is quantitatively recorded in a database accessible through the Observing Systems Capability Analysis and Review tool (OSCAR) of the WIGOS Operational Information Resource (WIR, see section 2.7 below). The information on surface-based networks and instrumentation details is currently recorded in OSCAR/Surface. Space-based capabilities are also recorded and made available through OSCAR. OSCAR allows to perform gap analyses to identify weaknesses in existing observing programmes.

The above steps represent the analysis phase of the RRR, which is as objective as possible. Next is the prioritization and planning phase of the RRR in which experts from the various application areas interpret the gaps identified, draw conclusions, identify key issues and priorities for action. This input is composed as Statements of Guidance (SoG) from each application area. The technical commissions respond to the SoG by formulating new global observing system requirements and the regulatory and guidance publications to assist Members in addressing the new requirements. Additionally, CBS and other technical commissions draw on the SoGs to develop a Vision and an Implementation Plan for further developments of WIGOS.

### Table 1: The 14 recognized WMO Application Areas

<table>
<thead>
<tr>
<th>No.</th>
<th>Application Area</th>
<th>No.</th>
<th>Application Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Global NWP</td>
<td>8</td>
<td>Providing Atmospheric Composition information to support services in urban and populated areas</td>
</tr>
<tr>
<td>2</td>
<td>High-resolution NWP</td>
<td>9</td>
<td>Ocean applications</td>
</tr>
<tr>
<td>3</td>
<td>Nowcasting and very short-range forecasting</td>
<td>10</td>
<td>Agricultural meteorology</td>
</tr>
<tr>
<td>4</td>
<td>Sub-seasonal to longer predictions</td>
<td>11</td>
<td>Hydrology</td>
</tr>
<tr>
<td>5</td>
<td>Aeronautical meteorology</td>
<td>12</td>
<td>Climate monitoring</td>
</tr>
<tr>
<td>6</td>
<td>Forecasting Atmospheric Composition</td>
<td>13</td>
<td>Climate applications</td>
</tr>
<tr>
<td>7</td>
<td>Monitoring Atmospheric Composition</td>
<td>14</td>
<td>Space weather</td>
</tr>
</tbody>
</table>

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7. The RRR describes data requirements, which are expressed in terms of space/time resolution, uncertainty, timeliness, etc., for each of the required observed variables, and are measures independent of observing technology.

8. Capabilities are derived from the individual platforms characteristics submitted by Members to WMO e.g. through OSCAR/Surface, or its evolution

At the Regional Level

Although the primary coordination of the RRR lies with CBS for overall WIGOS planning, the regional association, through the WG-OTI, follow the technical guidance of the technical commissions as represented in the EGOS-IP and other observation system implementation plans in order to evolve and implement observing systems in the Region.

The regional association will examine, and report back to CBS, its requirements for data, and any issues it identifies with the global WIGOS design, taking into account the particular requirements of the Region and international river basin authorities. This process involves, in essence: (1) the use of the global data to prepare regional data requirements; (2) use of this for detailed planning of observing system components at the regional scale; and then (3) encouragement of Members of the Region to implement these components, subject to further review at the national or subregional level, where appropriate.

At the National or Subregional Level

The Members of the Region contribute to the collective regional effort to: (1) assess the regional data requirements and plan the regional observing system components; and (2) implement and evolve observing systems following this plan, the EGOS-IP and other observation system implementation plans. It is expected that Members of the Region prepare their national WIGOS implementation plans (N-WIP) in accordance with R-WIP-I by considering their national requirements for the observing systems.

The Members of the Region also have global and regional data requirements information available to use as guidance for the preparation of national requirements information which can then be used to assist with the detailed planning for evolution of national observing components of WIGOS.

In some cases, where countries are small and geographically close or already have established multilateral working relationships, there may be more merit in taking a subregional, as opposed to national, approach to WIGOS observing infrastructure planning. In this case, it will be necessary for the Members concerned to work in close cooperation to prepare subregional reviews of requirements to be used as a basis for detailed planning at that scale. Where bilateral relationships exist, these should be used to strengthen and support WIGOS Key Activity Areas.

2.4 Observing System Operation and Maintenance

Observing system owners or custodians are responsible for operating and maintaining their systems and for complying with the regulations of the WMO and co-sponsored observing systems to which they contribute. System owners are generally NMHSs or other organizations within WMO Member countries but are sometimes other entities.

WIGOS on the regional level involves a process for sharing of operational experiences, practices and ideas, for sharing of expertise and for pooling resources for joint activities. The benefit is to realize synergies and greater efficiencies. These interactions may be between different teams within a single organization (such as an NMHS) or between regional organizations. These may benefit from technical guidance from relevant technical commissions and, while occurring primarily at a national level, there is a regional role to be played. Within Regional Association I, the following regional activities will be important, among others:

- Establishment of Regional WIGOS Centres
- CLIMDEV-AFRICA
- WHYCOS PROJECTS

10 See Annex 2 (List of Acronyms)
2.5 Quality Management

The Region recognizes that meeting the quality requirements and expectations of users is critical to the success of WIGOS. This requires an in-depth examination of current practices used by WMO observing programmes, specific mission-related requirements that are already in place, and available technological opportunities.

The WIGOS Quality Management approach is consistent with the framework of ISO 9001:2015 – Quality management systems – Requirements (see WMO Technical Regulations, WMO-No. 49, Vol. I, Part VII). In this context, the Region will give attention to:

(a) The examination of current quality management practices being used in the Region;

(b) The documentation of the quality of observations from the WIGOS regional networks at all stages of data processing; and

(c) Ensuring, where possible, traceability of observations to the International System of Units (SI).

A network of Regional WIGOS Centres (RWCs) is needed to assist Members to successfully implement WIGOS at the national and regional levels. Under the governance and guidance of the management group and with the support of relevant regional working bodies, the overall purpose of the RWCs is to provide support and assistance to Members of the Region for their national and regional WIGOS implementation efforts.

The basic functions of the RWC are, regional coordination, guidance, oversight and support of the WIGOS implementation and operational activities at the regional and national levels (day-to-day level of activities).

The mandatory functions are directly linked with two of the priority areas of the WIGOS Pre-operational phase (2016-2019):

1. Regional WIGOS metadata management (work with data providers to facilitate collecting, updating and providing quality control of WIGOS metadata in OSCAR/Surface);

2. Regional WIGOS performance monitoring and incident management (WIGOS Data Quality Monitoring System) and follow-up with data providers in case of data availability or data quality issues.

Depending on available resources and regional needs, one or more optional functions may be adopted, e.g. (a) assistance with the coordination of regional/subregional and national WIGOS projects; (b) assistance with regional and national observing network management; and (c) support for regional capacity development activities.

CGMS, in coordination and collaboration with WMO, supports the development of quality assurance standards and formats for satellite observations, multi-satellite and multi-sensor algorithms for estimating retrieved data and products, and advanced atmospheric sounding derivation packages for use by WMO Members. To assist this effort, the Region will ensure that surface-based sites that are needed for calibration/validation of satellite data are specified.

A key aspect of regional quality management that requires particular attention under WIGOS is the systematic and rigorous performance monitoring and evaluation (PM&E) of WIGOS capabilities, in terms of both: (a) the flow of observational data/products to models; and (b) provision of products/ information for decision-support tools and services in accordance with
requirements specified by end-users. Effective PM&E can improve the overall performance of WIGOS and its ability to effectively interact with its user community and to meet community needs and requirements.

The key priority will be the development of a modern and efficient performance monitoring and reporting system for observational data availability and data quality. This is essential for measuring the effectiveness and impact of WIGOS, and for developing robust incident management practices that will lead to improved WIGOS data quality and availability.

The plan is to put in place mechanisms and regional structures to handle incident management actions and support Members in improving the data availability and quality by RWCs.

### 2.6 Standardization, and Interoperability

A key area for WIGOS standardization relates to instruments and methods of observation. Standardization of observations is required to achieve system interoperability (including data compatibility) across all WIGOS component observing systems and these are key to turning observations into effective data/products that meet real needs of all Members.

WIGOS standardization should build on existing WMO and other international standards, recommended and best practices and procedures, and take into account the ongoing rapid progress in technology that will continue to provide a basis for further improvements in the capability, reliability, quality and cost-effectiveness of observations.

System interoperability and data compatibility also rely on the use of standardized data representation and formats, standardized methods for information exchange, and standardization in data management. The first two lie in the WIS domain and the third is a natural extension of WIS responsibilities. It is important that WIGOS and WIS implementation activities are closely coordinated in this respect, and that WMO agrees on an approach to standardizing data management across Programmes.

All WIGOS related standard and recommended practices and procedures are documented in the Technical Regulations (WMO-No. 49), its Annex VIII, the Manual on WMO Integrated Global Observing System (WMO-No. 1160) and other relevant Manuals. Guidance material is being documented in the Guides and other technical documentation under the responsibility of the respective technical commissions.

The Region supports all activities leading to the interoperability (including data compatibility) of WIGOS observing components through utilization and application of the same, internationally accepted standard and recommended practices and procedures (that is, standardization). Data compatibility is also supported through the use of standardized data representation and formats.

### 2.7 WIGOS Information Resource

The WIGOS Information Resource (WIR), accessible via a centralized point (web portal), provides seamless access to all WIGOS-related operational information, including observational user requirements, a description of the contributing observing networks (instrument/site/platform metadata), and their capabilities, list of standards used in the WIGOS framework, data policies applicable, and information on how to access data. It also provides general information on WIGOS benefits, and impacts to Members. It is a tool for conducting critical reviews as part of the Rolling Review of Requirements, and can assist Members and the regional association in conducting observing network design studies as appropriate. It provides guidance on how to develop capacities in developing countries according to WIGOS requirements, and provides Members of the Region with a toolbox to be used nationally if and when required. The information collected is intended in particular to identify the gaps in the observational networks, identify areas where existing observing systems could be used, or where their scope

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11 Interoperability is a property referring to the ability of diverse systems to work together (inter-operate)
could be expanded at limited cost to address the requirements of more application areas. The information provided on standards supports the production of more homogeneous datasets and make the observations traceable and of known quality.

Understanding that sources of the individual components of the WIGOS Information Resource rely on the inputs from its Members, the Region is committed to provide regular inputs to keep the information resource up-to-date.

2.8 **Data Discovery and availability (of Data and Metadata)**

Within the WIGOS framework, the WMO Information System (WIS\(^{12}\)) provides exchange of data and interpretation metadata\(^{13}\), and management of related discovery metadata\(^{14}\). These discovery metadata play an important role in the discovery, access and retrieval of WIGOS observations and products by the entire WMO community.

Submission, management and archival of the data and metadata themselves is generally the responsibility of observing system owners/data custodians. However, several World Data Centres and a number of regional or specialized data centres exist that collect, manage and archive basic observational data that are relevant to WMO Applications. Members of the Region are responsible for submitting their data to these regional or specialized data centres. The regional association encourages its Members to abide by this commitment.

Members of the Region adopt WIGOS and WIS standards and make their data and metadata available through WIS for delivery or for discovery, access and retrieval services. In this regard, promotion and implementation of DCPCs (Data Collection and Production Centres) as well as National Centres will be supported and encouraged by the regional association. Guidance is being developed and provided through the appropriate WIGOS non-regulatory and technical documents.

2.9 **Capacity Development**

A coordinated capacity development effort at global, regional and national levels is of paramount importance to the developing countries in the implementation of WIGOS. This is especially the case for NMHSs of Least Developed Countries (LDCs) and Small Island Developing States (SIDSs), to enable them to develop, improve and sustain national WIGOS observing components. This needs to be complemented by capacity development efforts outside of WIGOS but in closely related areas to improve access to and effective utilization of observations, data and products, and related technologies. The WIGOS capacity development activities at the Regional level are focused on:

(a) Providing assistance to Members of the Region to introduce or improve institutional mandates and policies that enable effective implementation, operation and management of observing systems;

(b) Filling the existing gaps in the design, operation and maintenance of WIGOS observing systems, including both the infrastructure and human capacities development;

(c) Technological innovation, technology transfer, technical assistance and decision-support tools.

Capacity development in satellite applications for developing countries, LDCs and SIDSs are also addressed in the Implementation Plan for the Evolution of the GOS (see WMO/TD-No. 1267). The virtual lab (VL) will continue to grow and help all WMO Members realize the benefits of satellite data.

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\(^{12}\) [http://www.wmo.int/wis](http://www.wmo.int/wis)

\(^{13}\) Interpretation metadata is the information required to interpret the data

\(^{14}\) Discovery metadata is the information describing the data-sets, generally using ISO-19115 standard, and WMO core profile in case of WIS
2.10 Communication and Outreach

The Region is establishing its communication and outreach strategy through the efforts of WMO Members, Programmes, other regional associations and Technical Commissions (TCs), and co-sponsors. The strategy will provide details on WIGOS benefits, increased effectiveness, and efficiency, and impact on the activities of the Members of the Region, as well as on the socioeconomic benefits of WIGOS data. It will take advantage of outreach programmes developed and effectively deployed so far by WMO and its partner organizations within the Region.

The WIGOS Portal provides convenient access to relevant information on the regional communication, outreach and capacity development, aimed at complementing, not duplicating, others’ efforts. A variety of outreach materials are being developed to educate the Members, funding agencies, policy-makers and the general public, on the importance of WIGOS to society. Materials will include posters and other educational material for elementary and high school classes, a WIGOS brochure, a semi-annual or annual newsletter, an online photo and video library, and information on the current state of the observing systems.

3. REGIONAL PROJECT MANAGEMENT

The regional association is responsible for the Project through its Working Group on Observation, Telecommunication and Infrastructure (WG-OTI) with support from the Regional Office for Africa and its Subregional Offices.

3.1 Monitoring, review and reporting mechanism

(a) The regional association, through its Management Group, monitor, review, guide and support the overall implementation of WIGOS in the Region, and update the Implementation Plan if and when necessary;

(b) The regional association, through the chair of the WG-OTI, reports to the ICG-WIGOS and the WIGOS Project Office on the progress in implementation of WIGOS in the Region;

(c) The president reports at the RA’s sessions on WIGOS implementation.

3.2 Evaluation

The evaluation methodology is designed against WIGOS implementation activity tables, i.e. with respect to the activities, deliverables, timeline, responsibility and budget allocations. This will include a schedule of monitoring and evaluation activities and related responsibilities. Mid-term evaluation, interim progress reports and post-implementation reviews are planned as a means of providing early feedback on progress towards success, and as a means of meeting accountability and transparency requirements for the whole implementation phase. Members of RA I provide progress reports at the request of the RA I Management Group.

4. IMPLEMENTATION

4.1 Activities, Deliverables, Milestones, and Risks

Table 2, in Annex 1 to this Plan presents the key implementation activities that are required for the regional WIGOS implementation within the timeframe 2019–2024. The table is arranged to correspond to the activity areas presented in Section 2. In the table each implementation activity is presented along with its associated deliverables, timelines, responsibilities, and associated risk. For each activity in Table 2, a detailed activity plan will be developed by the responsible entity or entities, with support of the WG-OTI. The WG-OTI has responsibility for tracking execution of these activities and this plan itself.
5. **RESOURCES**

The activities for implementation of the WIGOS framework will be completed through resources of:

- The experts conducting the work of WG-OTI and its Task Teams;
- Member countries and their efforts to implement WIGOS;
- Partner bodies;
- Capacity development initiatives.

Both, human and funding resources are needed at the regional level for the implementation of many of the activities identified.

6. **RISK ASSESSMENT/ MANAGEMENT**

The Risk Management Plan (RMP) is being developed for each implementation activity/projects, including risk mitigation. The following risk areas are identified:

(a) Limited resources, both financial and human;

(b) Little awareness by the NMHSs in RA I Member countries of the importance and relevance of WIGOS and the benefits to be accrued by implementing WIGOS. As of now, WIGOS may not be among the highest priorities of NMHSs;

(c) Lack of understanding of benefits that WIGOS can bring to the Region, Subregions and the Members;

(d) Lack of cooperation and collaboration with key partners and stakeholders, particularly at the national level due to different priorities, mandates and expected outcomes.
Table 2  WIGOS Implementation Activities in Region I

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Deliverables</th>
<th>Timeline</th>
<th>Responsibility</th>
<th>Potential risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Update R-WIP-I, reflecting subregional priorities</td>
<td>R-WIP-I updated</td>
<td>by RA-I-18</td>
<td>WG-OTI, RA-I MG; WIGOS-PO</td>
<td>Low</td>
</tr>
<tr>
<td>1.2</td>
<td>Assess GCOS-IP and other WMO observing system implementation plans to identify actions relevant to RA I and assign priorities to these actions</td>
<td>Prioritized list of actions for RA I</td>
<td>2019-2022</td>
<td>WG-OTI, RA-I MG, WIGOS/PO</td>
<td>Medium/High</td>
</tr>
<tr>
<td>1.3</td>
<td>Explore ways of cooperation with existing WMO centres (RCCs, GISCs, etc.) and relevant regional organizations (ACMAD, ASECNA, ICPAC, AGRHYMET, etc.)</td>
<td>Decision on the role of the regional centres and organizations in implementation of WIGOS in RA I (if applicable)</td>
<td>2019-2022</td>
<td>RA I MG</td>
<td>Medium</td>
</tr>
<tr>
<td>1.4</td>
<td>Assist Members with developing N-WIPs</td>
<td>N-WIPs developed</td>
<td>2019 onwards</td>
<td>Members; WG-OTI; WIGOS-PO</td>
<td>Medium</td>
</tr>
<tr>
<td>1.5</td>
<td>Establish RWC(s) in pilot mode with complete regional coverage</td>
<td>RWC(s) established in pilot mode</td>
<td>2019 onwards</td>
<td>RA-I MG; WG-OTI; DRA/RAF</td>
<td>High</td>
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<tr>
<td>1.6</td>
<td>Assess the capabilities of RWC(s) to provide required functionalities</td>
<td>Assessment report</td>
<td>Upon successful completion of the Pilot phase</td>
<td>RA-I MG</td>
<td>Medium</td>
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<td>1.7</td>
<td>Establish coordination mechanisms across the RWCs</td>
<td>Mechanism established</td>
<td>2020 onwards</td>
<td>RA I MG; DRA/RAF; WIGOS-PO</td>
<td>Medium</td>
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<tr>
<td>1.8</td>
<td>Assess the needs of Members for support by RICs, RMICs and RRCs (in collaboration with CIMO)</td>
<td>Assessment report of Members needs for support by RICs, RMICs and RRCs</td>
<td>2020</td>
<td>WG-OTI, RA-I MG</td>
<td>Medium</td>
</tr>
<tr>
<td>1.9</td>
<td>Coordinate the actions for the assessment of the capabilities and performance of the RICs and RRCs (in collaboration with CIMO)</td>
<td>Assessment report of capabilities and performance of the RICs and RRCs and follow-up</td>
<td>2020-2021</td>
<td>RA I MG</td>
<td>High</td>
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<tr>
<td>2.0</td>
<td>Protect radio frequencies used in meteorology, climatology and Earth observations</td>
<td>Registration of radio frequencies used in observations and telecommunications with national telecommunications administrations. Maintaining periodical coordination meetings concerned with protection of such frequencies</td>
<td>Ongoing</td>
<td>Members</td>
<td>High</td>
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<tr>
<td>No.</td>
<td>Activity</td>
<td>Deliverables</td>
<td>Timeline</td>
<td>Responsibility</td>
<td>Potential risks</td>
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<tr>
<td>2.1</td>
<td>Enhance collaboration with key partner organizations in implementation of WIGOS at regional, subregional and national levels</td>
<td>MoUs and Agreements signed with regional, subnational and national partner organizations</td>
<td>2019 onwards</td>
<td>RA-I MG, RA-I President PRs</td>
<td>Medium</td>
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<tr>
<td>2.2</td>
<td>Establish and enhance collaboration with international partners in the collection of observations on at regional and subregional scale.</td>
<td>Partnership agreements, if applicable, at the regional and subregional levels</td>
<td>2019 onwards</td>
<td>RA-I MG WG-OTI RAF</td>
<td>Low</td>
</tr>
<tr>
<td>2.3</td>
<td>Cooperate with subregional and national organizations to provide observations required for the early warning systems and numerical weather prediction models</td>
<td>Partnership agreements (if applicable) at the regional and subregional levels</td>
<td>2019 onwards</td>
<td>WG-OTI; RAF</td>
<td>Medium</td>
</tr>
<tr>
<td>2.4</td>
<td>Establish and operate the WICAP Regional AMDAR Programme for Africa in accordance with the relevant decision of CG-18 and based on the WICAP Implementation Plan</td>
<td>Increased observations from AMDAR</td>
<td>2019 onwards</td>
<td>WG-OTI; WIGOS-PO</td>
<td>Medium</td>
</tr>
</tbody>
</table>

3. Design, planning and optimized evolution of WIGOS component observing systems at regional, subregional and national levels

| 3.1 | Update regional user requirements for key observing components | Report on regional observing system user requirements | 2019-2022 | WG-OTI | Medium |
| 3.2 | Develop a design of a RBON | RBON Design | 2019-2022 | WG-OTI | Medium |
| 3.3 | Review the implementation of the regional of GBON | Review Report | 2019-2022 | WG-OTI | Medium |

4. Observing system operation and maintenance

<p>| 4.1 | Collect best practices and examples of WIGOS implementation from Members and share them with other Members | Documented best practices and examples of WIGOS implementation efforts in Region I online | 2019-2022 | Members WG-OTI WIGOS-PO | Low |
| 4.2 | Establish routine monitoring and reporting capability of RBON | Reports routinely distributed to RA I Members and RA-I MG | 2019-2022 | RWCs WG-OTI WIGOS-PO | Medium |
| 4.3 | Develop and issue Region-specific guidance on the design and implementation of AWS Networks | Region-specific Guidance on AWS networks | 2019-2022 | RA I MG WG-OTI WIGOS-PO | Medium |</p>
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<tr>
<th>No.</th>
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<th>Deliverables</th>
<th>Timeline</th>
<th>Responsibility</th>
<th>Potential risks</th>
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<tbody>
<tr>
<td>5.1</td>
<td>Implement the real-time quality monitoring component of WDQMS</td>
<td>Quality monitoring implemented</td>
<td>2019 onwards</td>
<td>RWC in collaboration with NWP centres WG-OTI Members</td>
<td>High</td>
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<td>5.2</td>
<td>Achieve compliance of the RICs with their ToRs</td>
<td>Increased numbers of compliant RICs</td>
<td>Ongoing</td>
<td>RIC Members</td>
<td>High</td>
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<td>5.3</td>
<td>Assist Members in implementing technical regulations on calibration and maintenance</td>
<td>Assistance provided</td>
<td>Ongoing</td>
<td>RICs Members</td>
<td>High</td>
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<tr>
<td>5.5</td>
<td>Obtain as far as possible ISO/IEC 17025:2017 accreditation for calibration laboratories</td>
<td>Increased numbers of accredited calibration laboratories of Members</td>
<td>2019 onwards</td>
<td>Members’ national calibration laboratories</td>
<td>High</td>
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<tr>
<td>5.6</td>
<td>Achieve, through collaborative effort of Kenya, Morocco and South Africa full functionality of the RMIC</td>
<td>Operational RMIC</td>
<td>2019–2022</td>
<td>South Africa, Kenya and Morocco</td>
<td>Medium</td>
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</table>

### 6. Standardization and interoperability

| 6.1 | Implement the WMO Siting Classification Scheme through: | WMO Siting Classification Scheme is implemented | 2019 onwards | Members | High |
| 6.2 | Contribute to the process to monitor and report the level of compliance with WIGOS standards | Region involved and contributing to the process of monitoring and reporting on the level of compliance with WIGOS Regulatory Material | 2019 onwards | RA I MG RWC WIGOS-PO | Medium |
| 6.4 | Complete the TAC to TDCF migration coding in accordance with the requirements of the Commission for Basic Systems | Migration completed in the Region | 2019-2022 | Members RWCs WMO Secretariat | High |

### 8. Data discovery and availability (data and metadata)

<p>| 8.1 | Share WIGOS metadata through OSCAR/Surface | Up-to-date WIGOS metadata in OSCAR/Surface | 2019 onwards | Members | High |
| 8.2 | Assist Members in providing up-to-date metadata to OSCAR/Surface and ensure its ongoing maintenance | Up-to-date metadata in OSCAR/Surface | Ongoing | RWC | High |</p>
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<th>Potential risks</th>
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<tr>
<td>8.3</td>
<td>Share observations through WIS, including those from national organizations other than NMHSs</td>
<td>New sources of observations are available through WIS</td>
<td>2019 onwards</td>
<td>Members; WG-OTI</td>
<td>Medium</td>
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</table>

### 9. Capacity development

#### 9.1 Assist Members in enhancing their WIGOS related observing capacities
- **Deliverables**: Enhanced observing capabilities
- **Timeline**: 2019 onwards
- **Responsibility**: RWCS; WG-OTI; RAF; WIGOS-PO
- **Potential risks**: Medium

#### 9.2 Assist Members to establish/enhance institutional mandates and policies that enable effective implementation, operation and management of observing systems by Members
- **Deliverables**: Established/enhanced institutional mandates and policies for effective implementation, operation and management of observing systems by Members
- **Timeline**: 2019 onwards
- **Responsibility**: RA-I MG, PRs, DRA, WIGOS-PO
- **Potential risks**: Medium

#### 9.3 Assist Members in using the RRR to design national WIGOS networks
- **Deliverables**: Initial steps taken to improve design of national networks
- **Timeline**: 2019 onwards
- **Responsibility**: WG-IDT, WIGOS-PO
- **Potential risks**: Medium

#### 9.4 Assist Members in training in AWS-related issues
- **Deliverables**: Enhanced competencies in AWS related areas
- **Timeline**: 2019 onwards
- **Responsibility**: RA-I MG, WG-OTI, WIGOS-PO, RAF
- **Potential risks**: Medium

#### 9.5 Implement competency framework for meteorological observations, installation and maintenance of instrumentation, instrument calibration and management of observing programmes and networks
- **Deliverables**: Competency framework implemented
- **Timeline**: 2019 onwards
- **Responsibility**: RA-I MG, WG-OTI, WIGOS-PO, RAF
- **Potential risks**: High

### 10. Communication and outreach

#### 10.1 Raise awareness and commitment to WIGOS in the Region
- **Deliverables**: Effective communication and outreach
- **Timeline**: 2019 onwards
- **Responsibility**: WG-OTI; WMO Secretariat
- **Potential risks**: Medium

#### 10.2 Raise awareness and commitment to WIGOS at the national level
- **Deliverables**: Effective communication and outreach
- **Timeline**: 2019 onwards
- **Responsibility**: Members
- **Potential risks**: Medium
LIST OF ACRONYMS

ASECNA  Agency for Aerial Navigation Safety in Africa and Madagascar
ACMAD  African Centre of Meteorological Applications for Development
AGRHYMET  Regional Training Centre for Agrometeorology and Operational Hydrology and their Applications
CEOS  Committee on Earth Observation Satellites
AMadar  Aircraft Meteorological Data Relay
AMESD  The African Monitoring of Environment for Sustainable Development
CGMS  Coordination Group for Meteorological Satellites
CICOS  International Commission of the Congo-Ubangi-Sangha basin
CLIMDEV-AFRICA  Climate for Development in Africa
CONOPS  Concept of Operations
DAR  Discovery, Access and Retrieval
DB  Database
DCPC  Data Collection or Production Centre (of WIS)
DRR  Disaster Risk Reduction
ET  Expert Team (of WMO Technical Commission)
FAO  Food and Agriculture Organization of United Nations
GAW  Global Atmosphere Watch
GCOS  Global Climate Observing System
GCW  Global Cryosphere Watch
GEO  Group on Earth Observations
GEOSS  Global Earth Observation System of Systems
GISC  Global Information System Centre of WIS
GFCS  Global Framework for Climate Services
GOOS  Global Ocean Observing System
GTOS  Global Terrestrial Observing System
ICG-WIGOS  Inter-Commission Coordination Group on WIGOS
ICPC  Interagency Coordination and Planning Committee for Earth Observations
ICSU  International Council for Science
IOC  Intergovernmental Oceanographic Commission
ICPAC  IGAD Climate Prediction and Applications Centre
ISO  International Organization of Standardization
ITU  International Telecommunication Union
LDCs  Least Developed Countries
MoU  Memorandum of Understanding
MESA  Monitoring of Environment and Security in Africa
NMHS  National Meteorological and Hydrological Service
NOS  National Observing System
OSEs  Observing Systems Experiments
OSCAR  WIGOS Observing Systems Capabilities Analysis and Review tool
OSSEs  Observing System Simulation Experiments
QA  Quality Assurance
QC  Quality Control
QMF  Quality Management Framework
QMS  Quality Management System
PANGEA  Partnership for new GEOSS Application
RA  Regional Association
RCC  Regional Climate Centre
RIC  Regional Instrument Centre
RMIC  Regional Marine Instrument Centre
RRR  Rolling Review of Requirements
SADC-CSC  Southern African Development Community – Climate Services Centre
SIDS  Small Island Developing States
SoG  Statement of Guidance
SORT  “Standardization of Observations” Reference Tool (of WIGOS)
SLA  Service Level Agreement
TC  Technical Commission
Resolution 12 (RA I-17)

Regional Basic Synoptic Network and Regional Basic Climatological Network in Region I (Africa)

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) Resolution 9 (RA I-16) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region I (Africa),

(2) The Manual on the Global Observing System (WMO-No. 544), Volume I, Part III, sections 2.1.3.1–2.1.3.5, and the definitions of the Regional Basic Synoptic and Climatological Networks,

(3) The Manual on Codes (WMO-No. 306),

(4) The Manual on the Global Telecommunication System (WMO-No. 386),

(5) Resolution 60 (Cg-17) – WMO policy for the international exchange of climate data and products to support the implementation of the Global Framework for Climate Services,

Noting further:

(1) That the establishment and maintenance of a Regional Basic Synoptic Network (RBSN) of surface and upper-air synoptic stations, adequate to meet the requirements of Members and of the World Weather Watch, constitute one of the most important obligations of Members under Article 2 of the WMO Convention,

(2) That historical climate time series from the Regional Basic Climatological Networks (RBCNs), the Global Climate Observing System (GCOS) Upper-Air Network and GCOS Surface Network at a temporal and spatial resolution necessary to resolve the statistics of climate, including trends and extremes, are included in the annex to Resolution 60 (Cg-17) as part of the relevant data and products that should be exchanged among Members to support the implementation of the Global Framework for Climate Services,

Decides:

(1) That the stations and the observational programmes listed in Annex 1 to the present resolution constitute an update of the RBSN in Region I,

(2) That the stations listed in Annex 2 to the present resolution constitute an update of the RBCN in Region I;
Urges Members:

(1) To secure, at the earliest date possible, full implementation of the network of RBSN and RBCN stations and observational programmes set forth in Annexes 1 and 2 to the present resolution,

(2) To comply fully with the standard times of observation, the global and regional coding procedures and the data-collection standards as laid down in the Technical Regulations (WMO-No. 49), the Manual on the Global Observing System (WMO-No. 544), the Manual on Codes (WMO-No. 306), and the Manual on the Global Telecommunication System (WMO-No. 386);

Authorizes the president of Regional Association I (Africa) to approve, at the request of the Members concerned and in consultation with the Secretary-General, amendments to the list of RBSN and RBCN stations in accordance with the procedures laid down in the Manual on the Global Observing System (WMO-No. 544), Volume II – Regional Aspects, Region I – Africa, to monitor the implementation by the Members and to address non-compliance in consultation with the Member concerned and the Secretary-General.

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Annex 1 to Resolution 12 (RA I-17)

Update of the Regional Basic Synoptic Network in Region I

Note: This annex is an update to Resolution 9 (RA I-16) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region I (Africa)

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**LEGEND:** S = Surface; R = Radiosonde; W = Radiowind

---

**Annex 2 to Resolution 12 (RA I-17)**

**Update of The Regional Basic Climatological Network in Region I**

Note: This annex is an update to Resolution 9 (RA I-16) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region I (Africa)

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**UNITED REPUBLIC OF TANZANIA**

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Resolution 13 (RA I-17)

Regional Instrument Centres

REGIONAL ASSOCIATION I (AFRICA),

Recalling:

(1) Resolution 8 (RA I-16) – WMO Integrated Global Observing System Implementation Plan for Regional Association I (Africa),

(2) Resolution 27 (Cg-17) – Instruments and Methods of Observation Programme, which requested that the regional associations assess, at least every five years, existing Regional Instrument Centres (RICs), Regional Marine Instrument Centres (RMICs) and Regional Radiation Centres (RRCs) to verify their capabilities and performance, and that the regional associations review the requirements of their Members for services to be provided by these Centres,

(3) Recommendation 3 (CIMO-17) – Nomination process for Regional Instrument Centres, proposing a formal process for the designation and reaffirmation of RICs,

(4) The Terms of Reference of RICs, RMICs and RRCs published in the Guide to Meteorological Instruments and Methods of Observation (WMO-No. 8),

Reaffirming that RICs, RMICs and RRCs play a crucial role in ensuring the traceability of measurements to the International System of Units (SI) and in capacity-building, which is fundamental for the development and implementation of the WMO Integrated Global Observing System,

Having considered Resolution 11 (RA I-17) – Regional WMO Integrated Global Observing System Implementation Plan 2019–2022

Noting that five RICs (Algiers (Algeria), Gaborone (Botswana), Cairo (Egypt), Nairobi (Kenya) and Casablanca (Morocco)) have been designated to support Members of Regional Association I (Africa) (RA I),

Appreciating that Algeria, Egypt, Kenya and Morocco have already reconfirmed their willingness to continue hosting and providing the service of their RICs to Members of RA I,

Concerned about the lack of information on the status of the remaining RICs, and the slow progress of all RICs in achieving compliance with International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) 17025 – General requirements for the competence of testing and calibration laboratories,

Requests silent RICs to urgently clarify their status and whether they plan to continue supporting Members of RA I;

Requests all RICs of RA I:

(1) To provide support to the Members of RA I;

(2) To be proactive in promoting traceability throughout the region and carrying out capacity development activities for Members;

(3) To do their utmost to comply with their terms of reference and to strive for accreditation according to ISO/IEC 17025;

(4) To reconfirm their willingness to continue providing services to Members of RA I prior to the Eighteenth World Meteorological Congress;
(5) To endeavour to organize and take part in an inter-laboratory comparison to demonstrate their capabilities;

Invites the Commission for Instruments and Methods of Observation (CIMO) to assess the status of all RICs and RRCs of the region and to inform the RA I Management Group of their status;

Requests its Management Group:

(1) To regularly assess the needs of Members of RA I for support by RICs;
(2) To collaborate with CIMO to verify the capabilities and performance of RA I RICs and RRCs.

Resolution 14 (RA I-17)

Development of the Region I Aircraft Meteorological Data Relay programme under the International Air Transport Association and WMO collaboration

REGIONAL ASSOCIATION I (AFRICA),

Recalling Decision 60 (EC-69) – Potential future collaboration of WMO and the International Air Transport Association on the operation and development of the WMO Aircraft Meteorological Data Relay programme, which endorsed the establishment of a working arrangement between WMO and the International Air Transport Association (IATA), under which the two organizations would work together to develop the terms of reference and concept of operations for future collaboration on the WMO Aircraft Meteorological Data Relay (AMDAR) programme,

Noting that a working arrangement on the operation of the AMDAR programme was established between IATA and WMO in July 2017, establishing the grounds for potential future cooperation on matters related to the automated measurement and transmission of meteorological data from an aircraft platform, currently operational as the WMO AMDAR programme, recognized as a key component of the WMO Global Observing System,

Noting further that Decision 60 (EC-69) requested the Secretary-General, in coordination with the president of the Commission for Basic Systems, to work with IATA to further finalize and establish the working arrangement between WMO and IATA and to subsequently develop the concept of operations for the future possible collaboration between WMO and IATA on the operation and development of the AMDAR programme,

Having examined the draft proposed Concept of Operations (Annex II of RA-I-17 INF. 3.3(1)) and Purpose and Principles (Annex I of RA-I-17 INF. 3.3(1)) of the WMO–IATA Collaborative AMDAR Programme,

Having considered the implications of the Concept of Operations in committing Regional Association I (Africa) (RA I) to coordinating the establishment and maintenance of national and regional requirements for AMDAR observations and the resources for their provision and management,

Having been informed that IATA will play a leading role in ensuring that the agreed required AMDAR observations are provided efficiently and economically through coordination with its member airlines and the wider aviation industry,

Convinced that the collaboration will lead to the expansion and enhancement of the WMO AMDAR programme globally and, as a result, will bring increased and further benefits to meteorological applications and improvement to forecasting skills and services to aviation,
Endorses the proposed WMO collaboration with IATA on AMDAR under the proposed Concept of Operations and Purpose and Principles;

Decides that, subject to IATA and WMO entering into a formal collaboration on AMDAR through a resolution of the Eighteenth World Meteorological Congress in 2019, following Recommendation 9 (EC-70) – Establishment of collaboration between the International Air Transport Association and WMO on the operation and development of the WMO Aircraft Meteorological Data Relay programme, RA I will aim to compile its requirements for AMDAR observations by July 2020, with a view to beginning development of the Region I AMDAR Programme under the WMO-IATA Collaboration in January 2021 and potentially beginning its operation of the programme in January 2022.

Resolution 15 (RA I-17)

Space-based observing system

REGIONAL ASSOCIATION I (AFRICA),

Recalling:

(1) Resolution 12 (EC-65) – Regional requirements for satellite data access and exchange, and the endorsement by Regional Association I (Africa) (RA I) at its sixteenth session, in 2015, of the RA-1 Dissemination Expert Group (RAIDEG) as part of the RA-I Working Group on Observations and Infrastructure,

(2) Resolution 10 (RA I-16) – WMO/AMCOMET Regional Space Programme for Africa,

Aware of the critical importance of the space-based observing system components of the WMO Integrated Global Observing System (WIGOS) in providing weather, water and climate services in RA I,

Appreciating the essential role of the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) in providing satellite data and products from EUMETSAT-operated satellites to Members of RA I and in supporting capacity-building in RA I through the WMO – Coordination Group for Meteorological Satellites (CGMS) Virtual Laboratory for Education and Training in Satellite Meteorology, including through Centres of Excellence in Kenya (Nairobi), Morocco (Casablanca), Niger (Niamey) and South Africa (Pretoria),

Noting the establishment of a network of four Regional Advanced Retransmission Service (RARS)-AFRICA stations, to be placed in western, central, southern and eastern Africa for a full Direct Broadcast Network for Near Real-Time Relay of Low Earth Orbit Satellite Data (DBNet)-Advanced Television and Infrared Observation Satellite operational vertical sounder service in Africa,

Noting also that RAIDEG held its ninth meeting on 22–23 September 2018 in Abidjan (see final report) and noting the continuing work of the Group to express the satellite data requirements for RA I,

Noting further the Abidjan Declaration on Next Generation of Satellites Products for Weather and Climate Services in Africa (Abidjan Declaration), signed by representatives of the African Union Commission, the African Ministerial Conference on Meteorology, the Economic Community of Central African States, the Economic Community of West African States, the Intergovernmental Authority on Development, and the Southern African Development Community in Abidjan on the occasion of the 13th EUMETSAT User Forum in Africa on 24 September 2018,
Requests Members:

(1) To continue providing maintenance and updates for and training on the EUMETCast PUMA-2015 stations to ensure operational access to satellite data and products, as well as other global meteorological information (global numerical weather prediction (NWP) model outputs);

(2) To support the successful implementation of the Abidjan Declaration, which includes:
   
   (a) Adopting the Meteosat Third Generation (MTG) transition roadmap, as well as upgrading the PUMA-2015 station to make it an MTG-ready station;
   
   (b) Exploring the feasibility of developing and establishing an African Meteorological Satellite Application Facility to generate satellite products answering African needs;

(3) To support the implementation of the RARS-AFRICA network of four stations, with the aim of ensuring full DBNet coverage over Africa and support of NWP applications in Africa;

(4) To nominate national focal points to RAIDEG, as requested by RAIDEG through a letter sent by WMO to all Permanent Representatives in RA I, to ensure that the satellite data and product requirements of National Meteorological and Hydrological Services (NMHSs) are conveyed to satellite operators through RAIDEG;

Requests the WMO-CGMS Virtual Laboratory for Education and Training in Satellite Meteorology Centres of Excellence to fully consider the needs of NMHSs in designing their training courses and to expand these courses towards application-oriented training in support of climate, aviation, agrometeorology, marine and other applications.

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Resolution 16 (RA I-17)

WMO Information System in RA I (Africa)

REGIONAL ASSOCIATION I (AFRICA),

Recalling Resolution 23 (EC-70) – WMO Information System 2.0, and Decision 18 (EC-70) – WMO Information System 2.0 implementation approach,

Noting that the Commission for Basic Systems has been developing:

(1) An implementation plan for the WMO Information System (WIS) 2.0 strategy,

(2) Guidance and standards to support systematic information management practices,

(3) Procedures for Global Information System Centres (GISCs) to monitor the operations of WIS,

(4) Revised audit schedules and procedures for centres registered in WIS,

(5) The work done by the Commission for Basic Systems Steering Group on Radio Frequency Coordination (SG-RFC) in order to ensure that all Regional Association I (Africa) (RA I) spectrum issues related to observation and communication systems are addressed by SG-RFC,
Having been informed:

(1) That the WMO Monitoring and Evaluation process (Summary of Mid-Term Performance Assessment Report 2016–2017) shows that the knowledge of WIS and its national implementation level indicate that a significant number of Members (31% globally) have insufficient knowledge of WIS, and even a greater number (42% globally) have not started implementation of WIS,

(2) That GISC Casablanca has made contact with many of the centres in its area of responsibility to discuss the various possible means to connect to these centres as their principal GISC, and that GISC Pretoria has established connections with all but one centre (Malawi) in its area of responsibility using the Internet or direct lines,

(3) That the practice of transmitting real-time reports through a chain of Regional Telecommunications Hubs (RTHs) introduced delays that could be avoided,

(4) That the roles of RTHs within the World Weather Watch include activities in addition to data transmission,

Requests its Management Group through the appropriate mechanism:

(1) To identify Members lagging behind in WIS implementation and to assist them in achieving at least some of the new functionality, making use of the web-based services of their principal GISC or supporting RTH;

(2) To assist GISC Casablanca and GISC Pretoria in finalizing the establishment of Internet connectivity with all centres in their areas of responsibility;

(3) To reassess the role of RTHs in the region, including operational, technical and capacity development aspects;

(4) To provide regional coordination for the implementation of anticipated recommendations of the Commission for Basic Systems on WIS audit schedules and on operational monitoring by GISCs;

(5) To identify and monitor WIS training and development and to update the schedule of WIS training activities;

(6) To update the regional RA I WIS Implementation Plan (2014–2016), approved in Resolution 11 (RA I-16) – WHO Information System Implementation Plan for Regional Association I (Africa), to include these activities and to incorporate information sharing about WIS 2.0 demonstration projects and WIS 2.0 implementation progress;

(7) To provide feedback from its Members on WIS 2.0 implementation to the Commission for Basic Systems;

(8) To monitor radio frequency matters, in particular those relating to the upcoming World Radiocommunications Conference 2019 and future World Radiocommunications Conferences;

Requests Members:

(1) To review the status of their knowledge and level of implementation of WIS, in particular by updating their profile in the Country Profile Database;

(2) To send real-time reports directly to their principal and secondary GISCs;

(3) To work with RA I and the Secretariat to identify their needs in support of the national uptake of WIS services and facilitates;
(4) To facilitate the participation of experts to represent WMO matters in their national and regional spectrum management bodies, including the African Telecommunications Union;

(5) To propose the participation of national experts in the work of the SG-RFC;

**Encourages** Members:

(1) To offer additional training on WIS and to inform the Secretary-General of their intentions;

(2) To undertake pilot projects that inform, develop or validate the concepts and implementation of WIS 2.0 and to share knowledge, technology and expertise from these projects to support the adoption of WIS 2.0;

**Requests** the Secretary-General to facilitate the training activities identified by the Management Group and the participation and representation of RA I National Meteorological and Hydrological Service experts in radio frequency coordination matters, including the SG-RFC.

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**Resolution 17 (RA I-17)**

**Review of previous resolutions and recommendations of the Association**

**REGIONAL ASSOCIATION I (AFRICA)**

**Noting** paragraph 3.7.1 of the general summary of the *Ninth Session of the Executive Committee Abridged Report with Resolutions* (WMO-No. 67 RC.14),

**Considering:**

(1) That a number of the resolutions adopted before the seventeenth session of Regional Association I (Africa) have been revised and incorporated into the resolutions of the seventeenth session (as per the annex to the present resolution),

(2) That some of the previous resolutions have been incorporated into appropriate WMO publications or have become obsolete,

(3) That some of the previous resolutions are still to be implemented,

**Decides:**


(2) Not to keep in force the other resolutions adopted before its seventeenth session;
(3) To publish the text of the resolutions kept in force in the annex to the present resolution.

Note: This resolution replaces Resolution 14 (RA I-16) – Review of previous resolutions and recommendations of the Association, which is no longer in force.

Annex to Resolution 17 (RA I-17)

List of previous resolutions and recommendations of the RA I (Africa) which are still in force as at the date of its seventeenth session

(Reference: Abridged Final Report of RA I-16, Resolution 14)

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8 (RA I-16) | WMO Integrated Global Observing System Implementation Plan for Regional Association I (Africa) | X
9 (RA I-16) | Regional Basic Synoptic Network and Regional Basic Climatological Network in Region I (Africa) | X
10 (RA I-16) | WMO/AMCOMET Regional Space Programme for Africa | X
11 (RA I-16) | WMO Information System Implementation Plan for Regional Association I (Africa) | X
12 (RA I-16) | Implementation of the WMO Strategy for Capacity Development in Regional Association I (Africa) | X
13 (RA I-16) | Management Group and subsidiary bodies of Regional Association I (Africa) | X
14 (RA I-16) | Review of previous resolutions and recommendations of the Association | X

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**Resolution 1 (RA I-16)**

**IMPLEMENTATION OF THE WMO STRATEGY FOR SERVICE DELIVERY IN REGIONAL ASSOCIATION I (AFRICA)**

REGIONAL ASSOCIATION I (AFRICA),

**Noting:**

(1) That the Sixteenth World Meteorological Congress (Geneva, May/June 2011) approved the WMO Strategy for Service Delivery,
(2) That the Executive Council at its sixty-fifth session (Geneva, May 2013) endorsed the Implementation Plan for the Strategy,

(3) That the Strategy and its Implementation Plan were cross-cutting and could be applied in the development of weather and warning services, and climate and hydrological services,

(4) That The WMO Strategy for Service Delivery and its Implementation Plan (WMO-No. 1129) was published in March 2014,

Noting further:

(1) That Sixteenth Congress requested regional associations to make full use of the Strategy in developing specific plans appropriate to their own Regions, and in engaging in regional partnerships,

(2) That Sixteenth Congress also requested regional associations to seek every opportunity to transfer knowledge through advanced capacity-building approaches presented in the Strategy,

Having considered:

(1) That regional associations, including Regional Association I, had expressed the desire for ownership of the Implementation Plan and for taking responsibility to implement it in their respective Regions,

(2) That service-delivery-related priorities of the Association were fully catered for in the Strategy and its Implementation Plan,

Decides to assign to the Management Group the work of ensuring a harmonized and synchronized implementation of the Strategy by Members, as agreed in Resolution 13 (RA I-16) – Management Group and subsidiary bodies of Regional Association I (Africa);

Requests the Secretary-General to provide support to the Association in the implementation of this decision;

Requests the WMO Programmes to support the implementation of the Strategy in the Region by providing expertise and other forms of assistance, as may be requested.

Resolution 3 (RA I-16)
TROPICAL CYCLONE OPERATIONAL PLAN FOR THE SOUTH-WEST INDIAN OCEAN

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) A series of resolutions adopted by the General Assembly of the United Nations calling for international cooperation and action by WMO on the mitigation of the harmful effects of storms,

(2) Resolution 13 (RA I-16) – Management Group and subsidiary bodies of Regional Association I (Africa), under Decides 2 (e) and 4,
Considering:

(1) The need to enhance cooperative efforts by countries within the tropical cyclone prone south-eastern part of the Region to effectively carry out their roles in coordinated arrangements for preparing and issuing meteorological forecasts and warnings of all tropical cyclones affecting the area,

(2) That, to achieve this aim, it is essential to have an agreed tropical cyclone operational plan for the South-West Indian Ocean describing the coordinated arrangements and defining the observing, forecasting and warning responsibilities of all cooperating countries,

Decides to adopt the Tropical Cyclone Operational Plan for the South-West Indian Ocean (WMO/TD-No. 577, Report No. TCP-12) issued in the Tropical Cyclone Programme report series;

Authorizes the president of the Association to approve, on behalf of the Association, amendments to this Tropical Cyclone Operational Plan, as recommended by the Regional Association I Tropical Cyclone Committee for the South-West Indian Ocean;

Requests the Secretary-General to inform all Members concerned of any amendments to and updating of the Operational Plan.

Note: This resolution replaces Resolution 1 (XV-RA I), which is no longer in force.

Resolution 4 (RA I-16)

TECHNICAL PLAN OF THE REGIONAL ASSOCIATION I TROPICAL CYCLONE COMMITTEE FOR THE SOUTH-WEST INDIAN OCEAN

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) A series of resolutions adopted by the General Assembly of the United Nations calling for international cooperation and action by WMO on the mitigation of the harmful effects of storms,

(2) Resolution 13 (RA I-16) – Management Group and subsidiary bodies of Regional Association I (Africa), under Decides 2 (e) and 4,

Considering:

(1) The need for the Members affected by tropical cyclones to join together to develop a regional programme of action to reduce the loss of human lives and damage caused by tropical cyclones and associated phenomena,

(2) The need to establish a regional plan and an implementation programme,

Decides to make amendments to the Technical Plan of the Regional Association I Tropical Cyclone Committee for the South-West Indian Ocean as recommended by the RA I Tropical Cyclone Committee;

Authorizes the president of the Association to approve, on behalf of the Association, amendments to the Technical Plan, as recommended by the RA I Tropical Cyclone Committee for the South-West Indian Ocean;
Requests the Secretary-General:

(1) To notify all Members concerned of any amendments to the Technical Plan adopted by the Association;

(2) To assist Members concerned in the implementation of the Technical Plan.

Note: This resolution replaces Resolution 2 (XV-RA I), which is no longer in force.

Resolution 5 (RA I-16)

IMPLEMENTATION OF DISASTER RISK REDUCTION ACTIVITIES IN REGIONAL ASSOCIATION I (AFRICA)

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) The decisions of the Intergovernmental Board on Climate Services at its first and second sessions (Abridged Final Report with Resolutions of the First Session of the Intergovernmental Board on Climate Services (WMO-No. 1124) and Abridged Final Report with Resolutions of the Second Session of the Intergovernmental Board on Climate Services (WMO-No. 1149), respectively),

(2) The WMO Strategic Plan 2012–2015 (WMO-No. 1069),

(3) The Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress (WMO-No. 1077),

(4) The decisions of the Executive Council at its sixty-sixth session (Abridged Final Report with Resolutions of the Sixty-sixth Session of the Executive Council (WMO-No. 1136),

Noting further:

(1) The adoption of the Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters,

(2) Decision 2/CP.19 – Warsaw international mechanism for loss and damage associated with climate change impacts, adopted by the Conference of the Parties to the United Nations Framework Convention on Climate Change at its nineteenth session held in Warsaw, from 11 to 23 November 2013,

Considering:

(1) Disaster risk reduction (DRR) as one of the five priority areas for consideration under the voluntary resources of WMO and among the initial four high-priority areas of the Global Framework for Climate Services,

(2) The importance of a user-driven approach to development and delivery of weather, hydrological and climate services to support policy development, risk analysis, multi-hazard early warning systems, sectoral risk management, and disaster risk financing and insurance,
(3) The ongoing activities and opportunities for further collaboration with experts in the following DRR areas:

(a) Hazard and risk analysis,
(b) Multi-hazard early warning systems,
(c) Disaster risk financing and insurance,

(4) The establishment of the Commission for Basic Systems Task Team on the Provision of Operational Meteorological Assistance to Humanitarian Agencies, in coordination with the Commission for Climatology and the Commission for Hydrology, with focus on development of requirements of the humanitarian community for meteorological and hydrological products and services for mitigating the impacts of meteorological-related hazards,

(5) The outcomes of the first coordinated Capacity Assessment of National Meteorological and Hydrological Services in Support of Disaster Risk Reduction in 2006 and plans to conduct a second national and regional survey to assess capacities of these Services to support disaster risk reduction,

(6) Regional consultations for the post-2015 framework for disaster risk reduction coordinated by the United Nations Office for Disaster Risk Reduction (UNISDR),

(7) The Third United Nations World Conference on Disaster Risk Reduction, to be held in Sendai, Japan, from 14 to 18 March 2015, which would review and adopt the post-2015 framework for disaster risk reduction, including its two Preparatory Committee Meetings held in Geneva on 14−15 July and 17−18 November 2014,

Considering further:

(1) The expressed need of Members for guidelines, standards and training modules for development and delivery of weather, climate and hydrological services to support DRR decision-making, in alignment with principles of quality management systems,

(2) The experiences of Regional Association I in addressing natural hazards,

(3) The opportunities for coordination of the Association’s strategy and implementation plan with the regional DRR strategies through active engagement of the Association at the regional and subregional DRR platforms and events,

(4) That the Region offered some good practices in disaster risk management for a regionally coordinated meteorological network and was developing similar regionally coordinated institutional capacities for climate services,

(5) That a number of National Meteorological and Hydrological Services in the Region demonstrated good practices for provision of such services to the user community, and could thus support the development of DRR guidelines and training materials,

Requests the Secretary-General:

(1) To provide further regular updates on progress with the implementation of WMO DRR activities to the Management Group, relevant subsidiary bodies and Members of the Association;

(2) To provide assistance with resource mobilization for projects in support of disaster risk reduction and climate adaptation capacity development with a holistic user-driven approach to decision-making, which would link to the implementation of the Global Framework for Climate Services;
(3) To assist the president of the Association, its Management Group and relevant subsidiary bodies, in coordination with the UNISDR Regional Office for Africa, to contribute to the shaping of the post-2015 framework for disaster risk reduction;

Requests the president of the Association and its Management Group:

(1) To document the initiatives of the Region for implementation of the Global Framework for Climate Services related to DRR activities and to formulate corresponding recommendations to WMO constituent bodies based on the development of climate services for disaster risk reduction as input to the implementation of this Framework;

(2) To actively participate in preparations for the post-2015 framework for disaster risk reduction to ensure that the needs for strengthening of national and regional capacities for development and provision of weather, climate and hydrological services are considered as an integral part of DRR strategies and development plans at the national and regional levels;

(3) To address DRR-related matters, as appropriate, in respective areas of expertise of the subsidiary bodies of the Association;

Urges Members:

(1) To support the implementation of the WMO DRR activities in the context of regional/national capacity development and contributions and by documentation of their respective good practices;

(2) To participate in the Third United Nations World Conference on Disaster Risk Reduction;

(3) To participate actively in a second WMO Survey to assess national and regional capacities of National Meteorological and Hydrological Services to support disaster risk reduction.

Resolution 6 (RA I-16)

LAUNCHING THE ANNUAL STATEMENT ON THE STATUS OF THE CLIMATE IN THE AFRICAN REGION

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) That the successful provision of the WMO annual statement on the status of the global climate since 1993 resulted in high scientific and communication impacts at a global scale,

(2) The growing need of the scientific community, decision-makers and the public to have access to regional and national climate assessment on a regular basis,

Appreciating:

(1) The collaborative spirit within the Region, as demonstrated during the work on the first statement on the status of climate in Africa in 2013 (The Climate in Africa: 2013 (WMO-No.1147)) as a demonstration project,

(2) The valuable contribution of the Members of the Region to the WMO annual statement on the status of the global climate, as well as to The Global Climate 2001–2010 – A Decade of Climate Extremes (WMO-No. 1103),
Considering:

(1) The implementation of the Global Framework for Climate Services, particularly with respect to two of its pillars: Observations and Monitoring, and Climate Services Information System,

(2) The need for an enhanced collaboration mechanism to provide timely and high-quality climate monitoring information, focusing on regional temperature trends and weather and climate extreme events and their impacts, to be taken into account by policymakers and decisionmakers,

Decides to start issuing an annual Statement on the Status of the Climate in Africa starting from the year 2015;

Invites:

(1) Members to collaborate enthusiastically on this important project;

(2) The Secretary-General, in coordination with the president of the Association and the African Centre of Meteorological Applications for Development, to establish an ad hoc expert mechanism involving the experts and climate institutions of the Region, with additional supporting expertise from other Regions if necessary, to define and launch the first edition of the Statement in English and French, and where resources are available, to include Portuguese and Arabic, and to assist in mobilizing resources for the project;

(3) The Secretary-General to bring this resolution to the attention of Members.

Resolution 7 (RA I-16)

IMPLEMENTATION OF REGIONAL CLIMATE CENTRES AND NETWORKS IN REGION I (AFRICA)

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) The Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress (WMO-No. 1077),

(2) The Abridged Final Report with Resolutions and Recommendations of the Sixteenth Session of the Commission for Climatology (WMO-No. 1137),


(4) The 2010 edition of the Manual on the Global Data-processing and Forecasting System (WMO-No. 485), updated in 2012,

Recognizing:

(1) The criteria for formal WMO designation of Regional Climate Centres (RCCs) and RCC Networks in the WMO Technical Regulations as part of the Manual on the Global Data processing and Forecasting System (WMO No. 485), Volume I – Global Aspects,

(2) The role of RCCs in the implementation of the Global Framework for Climate Services,
Decides:

(1) That RCC implementation in Region I will comprise RCC Africa hosted by the African Centre of Meteorological Applications for Development, RCC Intergovernmental Authority on Development (IGAD) hosted by the IGAD Climate Predication and Applications Centre, RCC Southern African Development Community (SADC) hosted by the SADC Climate Services Centre, RCC-Network-Northern Africa, RCC-Network Economic Community of West African States and RCC Economic Community of the Central African States;

(2) That the operation of RCCs and RCC Networks in Region I, including demonstration phases and designation processes where required, be guided by an appropriate subsidiary body of RA I with oversight by the president of the Association in close consultation with the Commission for Climatology, the Commission for Basic Systems and the Secretariat;

(3) To promote two-way communication between the RCCs/RCC Networks and the National Meteorological and Hydrological Services in the Region, to ensure effective uptake of RCC products and enhanced national inputs and user feedback;

Urges:

(1) The RA I RCCs and RCC Networks to actively support the development and sustainable operation of Regional Climate Outlook Forums in the Region;

(2) The RCCs and RCC Networks in the Region, including those in the demonstration phase, to submit activity reports on an annual basis to the concerned subsidiary body and to undertake recommended actions to ensure fulfilment of WMO designation criteria;

(3) All Global Producing Centres for Long-range Forecasts and other centres in the Region routinely producing global climate information to support the efforts of and collaborate with the RA I RCCs and RCC Networks;

(4) All Members of the Association to support the activities of the RCCs in the Region, use the products and provide feedback to RCCs and Global Producing Centres for Long-range Forecasts on their effectiveness for further improvement and tailoring to user needs;

(5) All those concerned with the implementation of RA I RCCs and RCC Networks to keep themselves apprised of the implementation of the Global Framework for Climate Services, and to align their activities on an ongoing basis to support implementation of the Framework, particularly at the regional and national levels;

Invites the presidents of the Commission for Climatology and the Commission for Basic Systems and the Secretary-General to facilitate the necessary technical guidance for the development and operation of the RA I RCCs and RCC Networks.

Resolution 8 (RA I-16)

WMO INTEGRATED GLOBAL OBSERVING SYSTEM IMPLEMENTATION PLAN FOR REGIONAL ASSOCIATION I (AFRICA)

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) Resolution 50 (Cg-XVI) – Implementation of the WMO Integrated Global Observing System,
(2) Resolution 10 (EC-64) – WMO Integrated Global Observing System Framework Implementation Plan,

(3) Resolution 11 (RA I-16) – WMO Information System Implementation Plan for Regional Association I (Africa),

(4) The final reports from the five subregional RA I workshops on the implementation of the WMO Integrated Global Observing System (WIGOS) and the WMO Information System (WIS),

(5) That the expertise and knowledge acquired by the RA I Task Team on WIGOS will be vital for the success of the implementation of WIGOS in Region I,

(6) The extensive capacity development represented by the implementation of WIGOS at the subregional and national levels and the need to establish an appropriate supporting structure in RA I,

Noting further the final reports of the first, second and third sessions of the Inter-Commission Coordination Group on the WMO Integrated Global Observing System and the recommendations on WIGOS implementation, including the development of Regional WIGOS Implementation Plans,

Decides:

(1) To adopt the WIGOS Implementation Plan for Regional Association I (Africa) as presented in the annex to the present resolution;

(2) That WIGOS will remain a high priority for the Association during the next intersessional period;

Requests the Management Group:

(1) To regularly review and update the Implementation Plan; to guide, prioritize elements of, oversee and monitor the progress in the implementation of the Plan; and to submit amendments/updates to the Plan to the president of the Association for approval;

(2) To provide oversight on the implementation of the WIGOS Regional Plan and the WIS Regional Plan to ensure the efficient and effective exchange of observations and related products, and to consult with the appropriate technical commissions on technical aspects of the implementation;

(3) To reconstitute the Regional Association I Task Team on the WMO Integrated Global Observing System for the next intersessional period,

Requests Members:

(1) To develop their national WIGOS implementation plans;

(2) To nominate and provide adequate support to WIGOS National Focal Points who will be responsible for coordinating inter-agency collaboration and the development of national partnerships in the implementation of WIGOS within the country;

(3) To organize their activities so as to realize WIGOS goals and associated outcomes as described in the RA I WIGOS Implementation Plan;

(4) To communicate and promote the concept and benefits of WIGOS in the Region and nationally;

(5) To continue providing resources, including through the WIGOS Trust Fund and/or seconded experts, and in-kind contributions, to support the implementation of WIGOS in the Region;
Requests:

(1) Those Members hosting Regional Instrument Centres and Regional Radiation Centres to reaffirm their willingness to make these facilities available to other Members in the Region, and their compliance with the relevant terms of reference of these centres, at the latest by May 2015;

(2) Those Members that have established calibration instrument facilities and are willing to avail them for use by other Members express interest to do so;

Requests the Executive Council to consider reconstituting the Inter-Commission Group on the WMO Integrated Global Observing System for the WMO financial period 2016–2019, and to further strengthen the representation of the Regions in this Group;

Requests the Secretary-General:

(1) To explore the possibilities for establishing a permanent WIGOS support structure in Region I, which will be responsible for providing ongoing coordination and support for WIGOS development and implementation efforts at the regional, subregional and national levels;

(2) To provide the necessary technical support and assistance for the implementation of WIGOS in Region I;

Invites partners to participate in relevant implementation activities as specified in the RA I WIGOS Implementation Plan.

Resolution 9 (RA I-16)

REGIONAL BASIC SYNOPTIC NETWORK AND REGIONAL BASIC CLIMATOLOGICAL NETWORK IN REGION I (AFRICA)

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) Resolution 5 (XV-RA I) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region I,

(2) The Manual on the Global Observing System (WMO-No. 544), Volume I, Part III, Regulations 2.1.3.1–2.1.3.5, and the definition of the Regional Basic Synoptic and Climatological Networks,

(3) The Manual on Codes (WMO-No. 306),

(4) The Manual on the Global Telecommunication System (WMO-No. 386),

Considering:

(1) That the establishment and maintenance of a Regional Basic Synoptic Network (RBSN) of surface and upper-air synoptic stations, adequate to meet the requirements of Members and of the World Weather Watch, constitute one of the most important obligations of Members under Article 2 of the WMO Convention,
APPENDIX 2. RESOLUTIONS ADOPTED BY THE SESSION

(2) That the Fourteenth World Meteorological Congress welcomed the establishment of Regional Basic Climatological Networks (RBCNs) in all WMO Regions and urged Members to ensure that their operational observing stations compile and transmit the CLIMAT messages according to existing regulations,

Decides:

(1) That the stations and the observational programmes listed in Annex 1 to the present resolution constitute the update of the RBSN in Region I;

(2) That the stations listed in Annex 2 to the present resolution constitute the update of the RBCN in Region I;

Urges Members:

(1) To secure, at the earliest date possible, full implementation of the network of RBSN and RBCN stations and observational programmes set forth in Annexes 1 and 2 to the present resolution;

(2) To comply fully with the standard times of observation, the global and regional coding procedures and data-collection standards as laid down in the Technical Regulations (WMO-No. 49), the Manual on the Global Observing System (WMO-No. 544), the Manual on Codes (WMO-No. 306) and the Manual on the Global Telecommunication System (WMO-No. 386);

Authorizes the president of the Association to approve, at the request of the Members concerned and in consultation with the Secretary-General, amendments to the list of RBSN and RBCN stations in accordance with the procedures laid down in the Manual on the Global Observing System (WMO-No. 544), Volume II – Regional Aspects, Region I (Africa), and to monitor the implementation by Members and to address non-compliance in consultation with the Member concerned and the Secretary General.

Resolution 10 (RA I-16)

WMO/AMCOMET REGIONAL SPACE PROGRAMME FOR AFRICA

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) The critical importance of satellite observations to support weather, climate, marine and environmental services for disaster risk reduction, protection of life and property, and sustainable socioeconomic development of Africa,

(2) The benefits demonstrated by existing satellite-related activities in the Region, including the Meteosat and Metop programmes and the PUMA, AMESD and MESA projects of the European Organization for the Exploitation of Meteorological Satellites, and through training and capacity-building at the VLab Centres of Excellence,

(3) That in spite of rapid developments in the last two decades, an efficient and full exploitation of satellite observation data and products in the Region remains limited by access to data and information, capacity in regionally-tailored product development and in satellite utilization, as shown by WMO regional surveys,

(4) The work initiated by the African Union (AU), in collaboration with the African Ministerial Conference on Science and Technology (AMCOST) and the African Ministerial Conference
on Meteorology (AMCOMET) on an African Regional Space Programme, which addresses five thematic areas: Earth Observation; Navigation and Positioning; Satellite Communication; Space Physics; and Astronomy,

(5) That the role of AMCOMET in the African Regional Space Programme, through the AMCOMET Task Force on the Regional Space Programme, is to provide input relevant to operational meteorology and linked to the thematic areas,

(6) That meteorological space programmes generally consist of a ground segment, an application segment and a space segment,

(7) The experience gained by several African nations, such as Algeria, Kenya, Nigeria and South Africa, in their development of national space programmes, as well as the experience of emerging countries such as China and India in developing space programmes, which all started by developing and strengthening national ground and application segments,

**Recommends:**

(1) That the WMO/AMCOMET Regional Space Programme for Africa build to full extent on, and strengthen, existing satellite-related programmes and activities in the Region, and focus on key gaps identified by Members;

(2) That the prospective WMO/AMCOMET Regional Space Programme for Africa place emphasis on the further development of regionally tailored applications of space-based observations to weather prediction, climate monitoring and disaster risk reduction;

(3) That considerations for the prospective development of a space segment be based on a thorough gap analysis using:

(a) The WMO Rolling Review of Requirements process;

(b) The experience gained in applications of existing satellite systems;

(c) The identification of precise needs and of gaps in current and planned satellite systems;

(4) That the development of the WMO/AMCOMET Regional Space Programme for Africa be closely connected with the AU African Space Policy and African Space Strategy developed at the request of AMCOST, in collaboration with AMCOMET and the African Union Commission;

(5) That the concept and elements of a WMO/AMCOMET Regional Space Programme for Africa be further developed in 2015;

**Invites** Members of RA I to provide support to the AMCOMET Task Force on the African Regional Space Programme to further refine the concept of the WMO/AMCOMET Regional Space Programme for Africa, and to develop a programme proposal;

**Requests** the Secretary-General, through the WMO Regional Programme and the WMO Space Programme, to provide the necessary support in facilitating the development and implementation of the WMO/AMCOMET Regional Space Programme for Africa.
Resolution 11 (RA I-16)

WMO INFORMATION SYSTEM IMPLEMENTATION PLAN FOR REGIONAL ASSOCIATION I (AFRICA)

REGIONAL ASSOCIATION I (AFRICA),

Noting:


(2) The Manual on the WMO Information System (WMO-No. 1060),

Noting further:

(1) The importance of implementing the WMO Information System (WIS) to support WMO priority activities, including the WMO Integrated Global Information System (WIGOS) and the Global Framework for Climate Services,

(2) That the new functionality of WIS became operational in January 2012 and that Global Information System Centres Pretoria and Casablanca, along with those of Exeter and Toulouse, are providing operational support and capacity-building for the Region,

Decides to endorse the WMO Information System Implementation Plan 2014–2016 for Regional Association I (Africa), as given in the annex to the present resolution;

Requests the Management Group of Regional Association I to monitor WIS implementation within the Region, noting the desire of the Association that all of its Members be able to use WIS by the end of 2015;

Requests:

(1) All Members that have yet to do so, to confirm their Principal GISC and National WIS Focal Point as soon as possible in writing to the Secretary-General and to report on the progress of WIS implementation to the RA I Management Group;

(2) All Members to make the implementation of WIS a priority in their National Centres and Data Collection or Production Centres to ensure that staff supporting WIS components are appropriately trained in WIS support activities, in particular the creation and management of discovery metadata;

Requests all GISCs supporting RA I to work with Members to ensure that associated centres are compliant with the relevant standards laid out in the Manual on the WMO Information System (WMO-No. 1060) and to confirm compliance in writing to the Secretary-General;

Requests the Secretary-General to monitor WIS implementation and ensure liaison between Members, the Association and the technical commissions concerned.
Resolution 12 (RA I-16)

IMPLEMENTATION OF THE WMO STRATEGY FOR CAPACITY DEVELOPMENT IN REGIONAL ASSOCIATION I (AFRICA)

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) That the Executive Council at its sixty-fourth session (Geneva, June/July 2012) approved the Capacity Development Strategy that had been developed on the decision of the Sixteenth World Meteorological Congress (Geneva, May/June 2011),

(2) That the Executive Council at its sixty-fifth session (Geneva, May 2013) commented on and adopted the draft Capacity Development Strategy Implementation Plan developed by the Executive Council Working Group on Capacity Development,

Noting further:

(1) That the Executive Council at its sixty-fifth session urged regional associations to collaborate in and provide all possible support for the Capacity Development Strategy Implementation Plan,

(2) That the Strategy as approved by the Executive Council at its sixty-fourth session has a special focus on least developed countries and small island developing States, and thus, regarding the geopolitical particularities of Region I, offers important support to its Members,

Decides to assign to the appropriate mechanism within the Association the work of ensuring a harmonized and synchronized implementation of the Strategy by Members;

Requests Members to coordinate within the Association and support the implementation of the Strategy, especially in Region I;

Requests the Secretary-General to provide support to the Association in the implementation of the decision;

Requests the WMO Programmes to support the implementation of the Strategy in Regional Association I by providing expertise and other forms of assistance, as may be requested.

Resolution 13 (RA I-16)

MANAGEMENT GROUP AND SUBSIDIARY BODIES OF REGIONAL ASSOCIATION I (AFRICA)

REGIONAL ASSOCIATION I (AFRICA),

Noting:

(1) The Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress (WMO-No. 1077),

(2) The Abridged Final Report with Resolutions of the Fifteenth Session of Regional Association I (Africa) (WMO-No. 1068),
Considering the proposal made by the president of the Association,

Further noting:

(1) The effective role played by the RA I Management Group during the intersessional period,
(2) The growing need to plan and coordinate the activities of the Association in order to achieve the Expected Results and key outcomes of the WMO Strategic Plan and RA I Strategic Plan,
(3) The need to establish an effective and efficient work structure of subsidiary bodies and to guide and coordinate their activities during the intersessional period,
(4) The need to constantly keep abreast of the needs and issues of Members and communicate their requirements to the appropriate constituent bodies, technical commissions and the Secretariat,
(5) That there is need for a mechanism to address cross-cutting issues not handled by other working groups or task teams, especially issues related to Expected Results 6 and 7 of the WMO Strategic Plan 2012–2015,

Recognizing:

(1) That the Members agree on the importance of continuing the activities of the Management Group, as well as other working groups of the Association,
(2) That there is a growing need for greater coordination of the activities of the Association,
(3) That there is the need for an arrangement to discuss the matters of importance for the Association, including the activities of its working groups, their members and the rapporteurs, during the intersessional period,

Decides:

(1) To restructure the Management Group of Regional Association I (Africa), to advise the president and to make recommendations on matters relevant to the Association, with the following membership and terms of reference:

(a) Membership
   (i) RA I president;
   (ii) RA I vice-president;
   (iii) Chairpersons of Working Groups and the Tropical Cyclone Committee;
   (iv) Hydrological Advisor to the president;
   (v) Gender Coordinator;
(vi) RA I Members of the Executive Council and other experts may be invited by the president, as appropriate;

(b) Terms of reference

(i) To discuss matters related to the work of the Association, including emerging matters or matters requiring the adoption of actions that could not be postponed until the following regular session of the Association;

(ii) To plan and coordinate the work of the Association and its subsidiary bodies;

(iii) To ensure that priorities are addressed, and to advise on the appropriate arrangements to achieve results according to the Strategic Plan for the Enhancement of National Meteorological and Hydrological Services in WMO Regional Association I (Africa) 2012–2015 and the regional Operating Plan;

(iv) To select the members of the working groups and appoint chairpersons of the working groups from nominations provided by Members of the Association;

(v) To establish and review the structure and work of the subsidiary bodies of the Association, including the implementation of its recommendations, and to disband or reorganize the bodies as may be required;

(vi) To collaborate with the WMO Secretariat in the mobilization of resources, and to advise on the way to align resources with regional priorities and the implementation of the Operating Plan;

(vii) To coordinate and monitor the implementation of the Strategic Plan for the enhancement of the National Meteorological and Hydrological Services in Regional Association I (Africa), and to provide the contribution of Region I to the WMO Strategic Plan;

(viii) To finalize the RA I Operating Plan for the remainder of the fifteenth financial period based on the discussions during the sixteenth session of the Association and taking into account input from the Members of the Association, and to develop a regional Operating Plan for the sixteenth financial period (2016–2019);

(ix) To address other issues as they arise, including strengthening of strategic partnerships with regional organizations, development agencies and other stakeholders;

(2) To establish the following working groups:

(a) Working Group on Observations, Telecommunication and Infrastructure:

(i) Experts on WMO Integrated Global Observing Systems, including the chairperson of the RA I WMO Information System Implementation Team;

(ii) Experts on the WMO Information System;

(iii) Two experts on Instruments and Methods of Observation, one specializing in conventional observation systems and the other in remote systems;

(iv) Experts on regional telecommunications;

(v) Experts from the RA I Dissemination Expert Group on satellite data;

(b) Working Group on Climate Services and Applications:

(i) Expert on climate and data management;
(ii) Expert on climate prediction from seasonal to decadal;
(iii) Expert on agricultural meteorology;
(iv) Expert on climate variability/change and modelling;
(v) Expert on climate and health;

(c) Working Group on Improved Weather Forecasting, Natural Disaster Risk Reduction, Service Delivery and Communication:
(i) Expert on disaster prevention and mitigation;
(ii) Expert on marine meteorological and oceanographic services;
(iii) Expert on advancement, operation and application of numerical weather prediction, from nowcasting to medium-range forecast;
(iv) Expert on integrated service delivery, including Public Weather Services;

(d) Working Group on Hydrology and Water Resources:
(i) Expert on hydrological prediction and forecasting;
(ii) Expert on integrated water resource management, development and service delivery;
(iii) Expert on hydrological monitoring and data management;
(iv) Expert on water and climate;
(v) Expert on integrated high/low flow forecasting;

(e) Working Group on Compliance Issues in Marine and Aeronautical Meteorological Services and Cost Recovery:
(i) Expert on aeronautical meteorological services;
(ii) Expert on marine meteorological services;
(iii) Expert on quality management systems including compliance with International Civil Aviation Organization requirements and associated competences;
(iv) Expert on cost recovery from aviation and marine;
(v) Experts on human capital (capacity, development, retention, career path, etc.) issues;

(f) Tropical Cyclone Committee for the South-West Indian Ocean:
(i) 15 members of the Committee drawn from the Member countries most affected by the South-West Indian Ocean Tropical Cyclones;

(3) To establish the following Task Team:
Task Team on Aeronautical Meteorology;

(4) To invite the president to act as chairperson of the Management Group; the Management Group may invite experts of RA I to participate in their meetings depending on the need for such expertise;
To invite the president and the Management Group to develop the terms of reference for the working groups and task team, taking into account the priority areas provided by the Association and in consultation with appropriate technical departments of WMO;

**Requests** the president to ensure that Members are adequately represented in the Management Group and working groups, and that the Management Group meet at least once a year, or whenever it is deemed necessary, preferably in conjunction with other events or meetings;

**Requests** the Management Group, with input from the RA I Permanent Representatives, to activate initial RA I subsidiary bodies not later than 31 March 2015;

**Authorizes** the president to adopt the necessary decisions on important matters on behalf of the Association, after consultation with the Management Group;

**Further requests** the president to report to the Association during the intersessional period, as necessary, and at its next regular meeting, on the activities of the Management Group and the relevant decisions made on behalf of the Association.

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**Resolution 18 (RA I-17)**

**Gender equality**

**REGIONAL ASSOCIATION I (AFRICA),**

**Recalling** Resolution 59 (Cg-17) – Gender equality and empowerment of women, and its annex – WMO Gender Equality Policy;

**Recalling further** Decision 55 (EC-70) – Implementation of WMO Gender Equality Policy and Action Plan, and Decision 77 (EC-68) – WMO Gender Action Plan,

**Acknowledging** the outcomes of the Conference on the Gender Dimensions of Weather and Climate Services, held in Geneva from 5 to 7 November 2014 (Conference Report: Conference on the Gender Dimensions of Weather and Climate Services (WMO-No. 1148)),

**Reaffirming** the goal of achieving gender equality within WMO and gender sensitive weather, hydrological, climate and related environmental services that will contribute to an improved response to the specific needs and social and economic circumstances of women and men,

**Noting** that accelerated implementation of the African Union Gender Policy and the WMO Gender Action Plan is among the expected outcomes of the recently endorsed Integrated African Strategy on Weather and Climate Services,

**Recognizing** the instrumental role assigned to Regional Association I (Africa) (RA I) in this respect,

**Having examined** the statistics on the participation of women and men in the work of the Association, and WMO governance more generally,

**Celebrating** the very positive outcomes of and networking which occurred at the Regional Association I (Africa) Women’s Leadership Workshop, held in Cairo from 16 to 17 February 2019,
**Urges Members:**

1. To seek gender balance in the work of RA I, including in its Management Group and working structures, as well as within the governance and relevant bodies of the African Ministerial Conference on Meteorology (AMCOMET);

2. To seek gender balance in the WMO constituent bodies and their working structures;

3. To produce and communicate gender-sensitive weather, hydrological, climate and related environmental services;

4. To use the Integrated African Strategy on Weather and Climate Services and the WMO Gender Action Plan as guidance and undertake relevant actions at the national level;

5. To nominate national focal points on gender;

6. To develop and implement gender mainstreaming policies in their National Meteorological and Hydrological Services so that when WMO surveys are conducted, RA I is able to acquire additional statistics on gender activism and working with other gender bodies at the national level.

**Requests its Management Group:**

1. To undertake steps to implement the gender-related objectives and activities of the Integrated African Strategy on Weather and Climate Services as well as the WMO Gender Action Plan at the regional and national levels;

2. To develop strategies to increase the involvement of women in the work of AMCOMET and RA I;

3. To continue designating a regional gender coordinator and subregional gender focal points to promote and facilitate the implementation of the global and regional policies, strategies and plans mentioned above;

APPENDIX 3. DECISIONS ADOPTED BY THE SESSION

Decision 1 (RA I-17)

Organization of the session

Regional Association I (Africa),

Having considered the provisional agenda proposed by the acting president of RA I,

Approves the provisional agenda;

Approves the report of the representative of the Secretary-General on credentials in accordance with WMO General Regulations 21 to 24;

Adopts the establishment of committees for the duration of the session as:

(1) Nomination Committee:
   Chair: Marie-Louise RAKOTONDRAFARA (Ms), Madagascar
   Members: Mamadou Lamine BAH, Guinea
            Rebecca MANZOU (Ms), Zimbabwe

Agrees to the programme of work of the session:

(1) Working hours of the meetings: 9.30 a.m. – 12.30 p.m. and 2.30 p.m. – 5.30 p.m.;

(2) Arrangements and allocation of agenda items for the session;

Decides to suspend General Regulation 110 for the duration of the session to permit a rapid processing of documents in accordance with General Regulation 3;

Decides that in conformance with General Regulation 112, summarized minutes are not required for the session.

Decision 2 (RA I-17)

Implementation and coordination of Regional Climate Centre operations in Africa

Regional Association I (Africa) decides:

(1) To establish collaboration and coordination mechanisms to ensure the consistency and harmonization of operations of Regional Climate Centres (RCCs) in RA I (both designated and those under development), through regular coordination efforts facilitated by the RA I subsidiary body in charge of climate services;

(2) To expedite the establishment of RCCs in the following subregions:
   (a) RCC Southern African Development Community (RCC SADC) hosted by the SADC Climate Services Centre (SADC CSC);
   (b) RCC Economic Community of West African States (RCC ECOWAS) hosted by AGRHYMET;
   (c) RCC Economic Community of the Central African States (RCC ECCAS) hosted by a suitable organization to be identified by ECCAS;
(3) To invite Members in the South-West Indian Ocean region to explore the potential for an RCC arrangement focused on the island states/territories and coastal regions therein, in close coordination with the Indian Ocean Commission;

(4) To urge Members to:

(a) fully exploit products and services of the established RCCs/RCC-Networks, in order to improve provision of climate services at the national level;

(b) actively support the generation of RCC products and services by sharing national data, products and expertise;

(c) provide feedback in order to help further refine its products and services;

(5) To assess on a regular basis the utilization of RCC products and services by the Members through establishing feedback mechanisms under the auspices of Regional and National Climate Forums, to share the assessment among RCCs, and to revisit the respective implementation/operational plans to further improve functions and operations, based on the feedback;

(6) To request the RA I subsidiary body responsible for climate services to coordinate and facilitate RCC/RCC-Network operations both within RA I and in the cross-regional domains, in close collaboration with the concerned bodies of the Commission for Climatology (CCI) and Commission for Basic Systems (CBS) as well as RAs II and VI and RCC Africa.

See RA I-17/INF. 3.2.1 for more information.

**Decision justification:** RA I RCC Africa hosted by ACMAD (http://acmad.net/rcc/), Northern Africa RCC-Network (http://rccnara1.marocmeteo.ma/index0.php) and IGAD RCC hosted by ICPAC (http://rcc.icpac.net/) have so far been formally designated by WMO. The Regional Climate Outlook Forums (RCOFs) with sustained operations in RA I are for: Northern Africa (PRESANORD), Sudano-Sahelian Africa (PRESASS), Central Africa (PRESAC), Gulf of Guinea (PRESAGG), Greater Horn of Africa (GHACOF), South-West Indian Ocean (SWIOCOF), Southern African (SARCOF), as well as the cross-regional domains of Mediterranean (MedCOF, RA VI-RA I) and Arab (ArabCOF, RA I-RA II-RA VI) regions. This decision aims to consolidate and enhance RCC operations in RA I, including close liaison with other similar regional initiatives within and around the region (particularly the joint interests of RA I and RA II over the Arab region), to ensure comprehensive and complementary regional support to Members’ climate services as well as to promote optimal utilization of RCC products and services.

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**Decision 3 (RA I-17)**

**Regional agricultural meteorology and drought activities**

**Regional Association I (Africa) decides:**

(1) To encourage Members:

(a) to avail of the services provided by the Integrated Drought Management (IDMP), co-sponsored by the WMO and the Global Water Partnership, on drought monitoring and early warning systems and development of national policies in the region;

(b) to provide expertise on the agrometeorological and drought related projects in the region;
(c) to contribute weather and climate information to the WMO World Weather Information Service (WWIS) to facilitate the developing innovative ICT applications for the agricultural community in Africa;

(2) To urge Members to conduct user interface events with the agricultural community such as Roving Seminars to develop training material for such events.

See RA I-17/INF. 3.2.1(1) for more information.

**Decision justification:** IDMP has more 35 international, regional and national partner institutions that can provide assistance to countries though its Help Desk on the three pillars of integrated drought management: Monitoring and Early Warning; Vulnerability and Impact Assessment; and Mitigation, Preparedness and Response. Roving Seminars have been used in the region for several years to increase the interactions between the NMHSs and the agricultural community. There are several agrometeorological and drought related projects in the region that Members could provide experts to support to these regional projects. Based on a 2018 FAO/WMO project in Rwanda and Senegal, FAO demonstrated a smartphone application that could use WWIS data. This is a seamless method to ensure that WMO Members weather and climate data can be used by various application sectors including agriculture.

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**Decision 4 (RA I-17)**

**Global Climate Observing System**

Regional Association I (Africa) decides:

(1) To request Members to support the key messages which were agreed during a Regional Workshop in Africa from 31 October to 2 November 2018 in Entebbe, Uganda, by the participants from Uganda, Burundi, Kenya, Rwanda and Tanzania;

(2) To urge Members to assist in the development and expansion of the initial GCOS Reference Upper-Air Network (GRUAN) towards better global coverage, as well as to participate in the development of climate data records to improve the monitoring of vertical profiles of atmospheric Essential Climate Variables;

(3) To request Members to consider inter-comparison of instruments and parallel operations where they are changing instruments on climate observing sites, and to report to the WMO Secretariat of changes to practices and instrumentation or closing or opening GCOS Surface Network (GSN) and GCOS Upper Air Network (GUAN) stations;

(4) To encourage Members to submit historic data, including from any parallel operations, to the GCOS nominated Archive Centre (NOAA National Centers for Environmental Information (NCEI));

(5) To urge Members to support the GCOS Cooperation Mechanism as an efficient means to improve climate stations and to assist with the coordination of individual national efforts;

(6) To request Members to commit to GCOS requirements for GSN and GUAN, in terms of availability, content and quality, to ensure that climate stations meet the minimum requirements of reporting monthly CLIMAT messages and radiosonde soundings to 30hPa height levels.

See RA I-17/INF. 3.2.1(1) for more information.
Decision justification: A joint GCOS-WIGOS-GFCS-Copernicus workshop in collaboration with UNFCCC was held in Entebbe, Uganda, 31 October – 2 November 2018 to discuss observation needs for adaption, to promote guidance and best practice and design projects, and to improve observational networks in East Africa (Uganda, Burundi, Kenya, Rwanda and Tanzania). The workshop outcomes will be summarized in a regional plan to improve observations in East Africa and highlight the greatest needs and benefits of the proposed observational improvements. Donors are encouraged to address these needs, either through the GCOS Coordination Mechanism, other actors or directly. The GCOS Secretariat reports regularly on the GCOS Upper-Air Network (GUAN), the GCOS Surface Network (GSN), and the GCOS Cooperation Mechanism, including the station list update, monitoring statistics for past and current years and current and recent observations projects undertaken by the GCOS network management. The monitoring of the GCOS requirements from 2011 to 2018 show that RA I is in urgent need to improve its network performance.

Decision 5 (RA I-17)
Regional WIGOS Centre

Regional Association I (Africa) decides to endorse the intentions of Kenya and United Republic of Tanzania, and Morocco to establish Regional WIGOS Centres (RWCs) in pilot mode through a collaborative effort.

Requests its Management Group to support the establishment of these RWC pilots;

Urges Kenya and United Republic of Tanzania, and Morocco to proceed with developing and submitting their formal proposals to the president of RA I to establish RWCs in pilot mode, per the technical guidelines outlined in the Annex to Decision 30 (EC-69) (see http://www.wmo.int/pages/prog/www/wigos/documents/Tools/Annex-to-Decision-30_EC-69.docx);

Urges other RA-I Members to articulate their specific intended contributions to RWC and to join the RWC pilot efforts as and when appropriate;

Further urges all RA I Members to actively participate in the implementation of RWC(s) in their respective subregions;

Requests the Secretary-General to provide the necessary assistance and Secretariat support for the establishment of RWC(s) in RA I;

Authorizes its president to approve the pilot RWC(s) with applications from RA I Members on behalf of the Association, in consultation with the Management Group and upon recommendations of experts from the relevant WMO Technical Commission(s), supported by the WMO Secretariat;

Invites the partners to participate in establishing the RWC in the Region.

Decision justification: The RA I Management Group recognized the importance of establishing Regional WIGOS Centre(s) in pilot mode to support the implementation of WIGOS and to strengthen the overall observing capabilities in the Region, and it took note of the intention of Kenya and United Republic of Tanzania, and Morocco to collaborate on establishing a Regional WIGOS Centre in pilot mode. The intention expressed by ... to participate in RWC activities was also noted.
Decision 6 (RA I-17)

Education and training

Regional Association I (Africa) decides:

(1) To request that Permanent Representatives of RA I Members and Directors of WMO Regional Training Centres (RTCs) collaborate on education and training activities with the aim of ensuring that the principles in annex to this decision are taken into account in the operations of the RTCs in the region;

(2) To recommend reconfirmation of all RTCs in the Region;

(3) To request the Secretary-General to commission and assessment of the Regional Training Centre in Angola with a view of understanding the reasons for its current lack of regional contributions and to support its operations and begin utilizing it for the benefit of the Portuguese speaking countries in Africa;

(4) To request that Permanent Representatives of Members establish links with national and regional meteorological societies, academies of sciences, and research institutions for the purpose of maximizing the pool of resources of experts who are willing to contribute to education and training activities;

(5) To request that Permanent Representatives of Members participate in fundraising and resource mobilization to support fellowships and other education and training activities;

(6) To request the involvement of RTCs and other regional NMHS training institutions in the WMO Global Campus activities;

(7) To recommend adoption of Basic Instructional Package for Meteorologists (BIP-M) and Basic Instructional Package for Meteorological Technicians (BIP-MT) by all RTCs and other training institutions in the Region;

(8) To request the Secretary-General to support and promote training activities on leadership and management development in the Region.

See the Annex to the present decision.

Decision justification: The Thirteenth WMO Symposium on Education and Training (see SYMET-XIII for the summary of outcomes) was held in Barbados from 29 October to 2 November 2017; and the Twenty-eighth Session of the Executive Council Panel of Experts on Education and Training (28th EC Panel) was held in Kenya from 17 to 19 April 2018. Taking into consideration the outcomes of these discussions and considering that education and training is a top priority in the Region, education and training must be embedded as critical elements in all WMO capacity development activities.

EC-68 Resolution 8 defines criteria for designation of new WMO Regional Training Centres and the role of the Regional Associations in recommending the designation of the new WMO Regional Training Centres. Considering that the RTCs in Egypt, Kenya, Madagascar, Nigeria and South Africa have been or are being externally reviewed by the EC Panel of Experts on Education and Training; and following the conclusions of external reviews and the recommendations of the EC Panel of Experts on Education and Training, as well as the Decision of Regional Association I, reconfirmation of these RTCs will be considered by the Cg-18.

The report, Impact Evaluation of WMO Fellowships, arising from a study conducted by WMO, highlights the need to pay more attention to formal and continuing education, especially in developing and least developed countries and hence the need for Members to cooperate towards ensuring that adequate resources are provided for this purpose.
As regards leadership and management in NMHS, EC-69 Decision 54 calls for a strong focus on these elements of NMHS operations. Similarly the 17th Session of RA V, Decision 29 of RA II-16 requested WMO to put in place training and related initiatives aimed at enhancing the management capacity of officials of NMHSs.

See RA I-17/INF. 4.1 for more information.

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**Annex to Decision 6 (RA I-17)**

**WMO Regional Training Centres and collaboration on education and training activities**

Permanent Representatives of Members and Directors of RTCs are strongly encouraged to take into account the following in the running of the Centres:

1. Alignment of their programmes to support the WMO competency and qualification frameworks and to provide participants with certification / documentation that demonstrates what elements of the various competency frameworks had been addressed adequately in the training intervention;

2. Creation of a directory of national/regional/institutional specialities in all WMO priority areas, with a view of utilizing the information to promote delivery of WMO activities in the Region;

3. Sharing, using and promoting educational and training resources and encouraging collaboration through WMO Global Campus mechanisms;

4. Participation in fundraising and resource mobilization to support the Fellowships Programme and other education and training activities;

5. Running leadership and management development courses for NMHSs;

6. Taking into account the effects of the rapid changes in technology and user-orientated services whilst developing and revising their education and training programmes and curricula;

7. Implementing the approaches and principles described in the Guide to the Management and Operation of WMO Regional Training Centres and Other Training Institutions (WMO-No. 1169) and other related WMO publications;

8. Regular submission of annual reports.

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**Decision 7 (RA I-17)**

**Country profile database**

**Regional Association I (Africa) decides:**

1. to be the pilot region for a full roll-out of the Country Profile Database (CPDB) Version 3;

2. to review and, if not already assigned, designate CPDB Focal Points, authorizing them to:
   (a) Serve as liaison with the Secretariat on this matter;
(b) Facilitate the input of data; and

(c) Participate in the continued development and improvement of CPDB.

See RA I-17/INF. 4(2) for more information.

**Decision justification:** The new version of the Country Profile Database will “go live” shortly. This will require Member information to be updated. RA I is requested to be the pilot region for this update. Through the CPDB, the WMO M&E System will be able to measure performance in the implementation of the WMO Strategic and Operating Plans both for WMO and the WMO development partners. Complete and reliable monitoring data facilitates decision-making, informs strategic planning, and assists in resource mobilization. In addition an up-to-date CPDB will reduce the number of surveys and data collection requests to Members, NMHSs will also be able to use this information as an internal tool comparing national status with the regional and global community.

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**Decision 8 (RA I-17)**

**Scaling-up effective partnerships**

**Regional Association I (Africa) decides** to request the Secretary-General to scale up WMO’s support to strengthen the National Meteorological and Hydrological Services (NMHSs) infrastructure, capacity, and service delivery through:

- the establishment of effective partnerships, including with the Green Climate Fund (GCF), The World Bank (WB), the African Development Bank (ADB) and other development and climate finance partners;

- increased diversification of WMO country support mechanisms, in particular for Least Developed Countries and Small Island Developing States, including the planned Country Support Initiative, that is expected to also support NMHSs in their engagement with Green Climate Fund National Designated Authorities.

**Decision justification:**

The growing flow of resources for hydromet services - including from the GCF, Multilateral Development Banks, and bilateral partners - requires a more systematic and complementary approach to ensure sustainable investments. The objective of the WMO Secretariat is to substantially scale up its support to developing countries in implementing the WMO 2020-2023 Strategic Plan.

The Country Support Initiative is the cornerstone of the Organization’s commitment to scale-up partnerships above and beyond business as usual and to step up its role in supporting developing countries to close the capacity gap. The Country Support Initiative is aimed at mobilizing financial investment from bilateral partners to provide rapid, gap filling and tailored support to developing country NMHSs and their development partners, harnessing the best available science, expertise and products from the WMO institutional network (Secretariat, NMHSs, technical commissions, global and regional centres, programmes/mechanisms/initiatives, and consultants). Through this approach, the Initiative seeks to connect and align projects and approaches thereby reducing fragmentation and enabling a greater impact and development effectiveness of hydromet investments.
Decision 9 (RA I-17)
Public-private engagement

Regional Association I (Africa),

Noting Resolution 33 (EC-70), Public-Private Engagement,

Decides to encourage all Members in RA I to use the WMO Policy Framework for Public-Private Engagement as the main guidance in establishing win-win partnerships between the public, private and academic sectors, compliant with national policies and legislation and following the agreed principles for successful public-private partnerships that enhance socio-economic benefits to society;

Decides further to encourage RA I Members to share practices and lessons learnt with regard to the engagement of the private sector and academia in the various parts of the service value chain and to contribute to the ongoing global dialogue between the public, private and academic sectors (global weather enterprise);

Requests the Management Group to:

1. consider mechanisms for greater engagement of experts from the private sector and academia from the RA I Members.
2. to develop guidance for public-private engagement in RA I.

Requests the Secretary-General to provide assistance and support to the Management Group in the implementation of the decision.

See RA I-17/INF. 4(4) for more information.

Decision justification: The WMO Policy Framework for Public-Private Engagement adopted by the EC-70 is the first WMO formal guidance on the issue of public-private engagement (PPE) in the so-called global weather enterprise (GWE). It defines general principles of successful engagements/partnerships and elaborates on the roles of the GWE stakeholders in the new landscape of service delivery value chain. To that end, there is a need for raising awareness among the WMO Members of the new realm of the GWE as a multi-sector, multi-stakeholder environment which brings risks but also opportunities for the NMHSs including innovation in all areas – from observations to the end-user services. It is recognized that national circumstances vary greatly in terms of institutional arrangements and partnership culture from country to country; therefore, the Members should be encouraged to share national cases and practices, both good and bad experiences, in order to build common awareness of those risks and opportunities. The proposed RA I decision is aimed at bringing the PPE and GWE subject to the main focus area of the regional association since this new GWE realm will determine the future agenda, resources and approaches to the provision of meteorological, hydrological and climatological services at all levels – national, regional and global.

Regional Association I (Africa) decides:

(1) To task the Management Group in consultation with Members, with the support of the WMO and AMCOMET Secretariats and based on the priorities set out by the Integrated African Strategy on Weather and Climate Services, and draft WMO Strategic and Operating Plan, summarized in the Annex to this decision to develop the Regional Operating Plan as a matter of priority following the Eighteenth World Meteorological Congress (Cg-18);

(2) To task the Management Group, in full consultation with the membership, the EC Working Group on Strategic and Operational Planning and its Task Team on Constituent Body Reform, to guide the region to a better understanding of the proposed WMO Constituent Body Reform and provide advice on the implications of this for the working processes of the Regional Association and its Members and their future interaction with the other Constituent Bodies of WMO;

(3) That in preparation for the detailed deliberations that will occur at Cg-18, all RA I Members should review the Constituent Body Reform proposal from Executive Council (RA I-17/INF.1.2(1)) and transmit their views to the President of the Regional Association and the Management Group.

See the Annex to the present decision.

See RA I-17/INF.1.2(1), RA I-17/INF.1.2(2) and RA I-17/INF.5.1(1) for more information.

Decision justification: ...The WMO Constituent Body Reform process is currently underway, including the rationale and drivers for the reform, and the latest proposals from the seventieth session of the Executive Council that will be presented to Congress this year for consideration. Delegates reflected on the implications of the reform on Members, the Regional Association and technical commissions and discussed ways to contribute to the process going forward. Participants noted that the reforms have the potential to improve the efficiency and effectiveness of WMO by reducing the complexity and duplication of activities. It was also agreed that it will be very important that the work cycles of the various constituent bodies be properly aligned in terms of work programs and the timing of key sessions.

Recommendation 24 of EC-70 amended the General terms of reference of the Regional Associations; Regional Associations should be encouraged to influence and fully align with the relevant structures of the technical commissions and with the strategic goals of the WMO Strategic Plan. Furthermore, pursuing harmonized structures among all regional associations should promote common approaches and better cross-regional cooperation.

The regional priorities identified by the Regional Association as contained in the Annex to this decision have been identified by Management Group and Working Groups based on work done in the intersessional.
Annex to Decision 10 (RA I-17)

Identification of regional priorities

1. **Purpose**

The seventeenth session of RA I (22-23 February 2019) offered an opportunity for RA I Members to discuss the issues of the region and to identify and record an agreed set of priorities upon which to focus the future work of the Regional Association and to help inform decisions regarding appropriate regional working structures.

2. **Background**

The Report of the Acting President of RA I, and the Chairs of RA I Working Groups presented at the beginning of RA I-17 gave a very up-to-date assessment of the priority needs of Members.

The Joint RA I Regional Conference / Fourth AMCOMET Technical Session and the Ministerial AMCOMET Session held over the four days prior to the RA I session, produced a series of recommendations related to priority areas which gave further insights on the issues of most concern.

3. **Approach**

Gathering together the guidance provided by both of these activities gave an initial picture of regional priority areas, covering a broad domain of themes and activities.

These were synthesized and translated into a set of priorities, expressed in the framework language of the EC-approved draft WMO Strategic Plan, i.e. in terms of Objectives and Focus Areas. Expressing the priorities in this way ensures very tight coupling with the overall WMO Strategic and Operating Plan framework and the associated budget structures. This ensures that the regional priorities are tightly linked to the organization’s overall objectives, agreed work programs and associated governance structures, and helps ensure that each area of regional need has a solid footing in the WMO SOP.

An additional purpose of these priorities is to help guide the establishment of RA I’s own internal working mechanisms, by providing direction on what needs to be achieved and therefore what specific bodies and associated terms of reference need to be established.

4. **Priority areas**

Listed below are the priority areas identified through this process and agreed by RA I Members.

(i) **Address the needs of developing countries, especially LDCs and SIDS to enable them to provide and utilize essential weather, climate, hydrological and related environmental services**

*Focus in 2020-2023:*

- Mobilize strategic resources involving development partners and national governments and assisting NMHSs to develop long-term strategies and operational plans to address the identified capacity needs;
- Increase visibility and sustainability of NMHSs in LDCs and SIDS by demonstrating, promoting and communicating the societal-economic value of their weather, climate, water and related environmental observations, research and services;
- Develop and sustain core competencies and expertise;
- Focus on training on management and leadership of NMHSs for governance.
(ii) **Strengthen effective partnerships for investment in sustainable and cost-efficient infrastructure and service delivery**

**Focus in 2020-2023:**

- Strengthen partnerships and alliances among all regional Members to share knowledge, technology and expertise with an emphasis on the use of twinning arrangements;
- Establish strategic, functional and mutually beneficial development partnerships and alliances with the key global, regional and national entities in the UN, intergovernmental and nongovernmental organizations, the private sector, and academia;
- Develop institutional legislative frameworks which support the national mandate of NMHSs to deliver services;
- Establish principles and guidance for successful public-private engagement, and facilitate a continuous dialogue between national and regional players;
- Provide NMHSs with further guidance and assistance in the assessment and enhancement of socioeconomic benefits of their marine, aviation and public weather services;
- Strengthen regional and national community outreach and education programs.

(iii) **Optimize the Regional Association structures for more effective decision-making**

**Focus in 2020-2023:**

- Strengthen the relationships and interactions between regional WMO bodies and other regional bodies with similar mandates, such as the African RECs / Regional Centres;
- Implement the decisions of Congress on optimized constructs, processes and duties of regional WMO bodies to enhance efficiency and effectiveness and good governance;
- Organize the working structures of the region to ensure effective alignment of regional working programs with areas of priority need.

(iv) **WIGOS: Optimize the acquisition of Earth system observation data through the WMO Integrated Global Observing System**

**Focus in 2020-2023:**

- Implementation of Regional and National Framework of WIGOS including established Regional WIGOS Centres (RWCs) and National WIGOS Centres (NWCs) as well as Regional Instrument Centres (RICs). In addition, advance the implementation of WIGOS at the regional and national levels;
- Identify critical gaps in observational data coverage and address that through the integrated design of observing networks;
- Strengthen efforts to establish observational networks on a sustainable basis, including amongst regional LDC members, through partnerships between Members and with external donor partners;
- Support of AMCOMET in the integration and coordination of the AMDAR and African Regional Space processes and programmes in Africa.

(v) **WIS: Improve and increase access to, exchange and management of observation data and derived products through the WMO Information System**
Focus in 2020-2023:

- Foster the continuous growth and evolution of WIS amongst regional Members to accommodate and exploit the different technical capabilities of Members;

- Ensure all Members confirm their Principal GISC and National WIS Focal Point as soon as possible and to report on the progress of WIS implementation to the RA I Management Group;

- Continue to make global, regional or limited-area meteorological prediction model products available on WIS for the benefit of all countries in RA I, and encourage Members contribute information for verification and feedback on their quality and usefulness, especially in forecasting meteorological hazards;

- Ensure staff supporting WIS components are appropriately trained in WIS support activities, in particular the creation and management of discovery metadata.

(vi) GDPFS: Enable access and use of numerical analysis and prediction products from the WMO seamless Global Data Processing and Forecasting System

Focus in 2020-2023:

- Enhance the GDPFS, including the sustainment of the Severe Weather Forecasting Demonstration Project (SWFDP), to enable all Members to improve their own national predictive capabilities and benefit from advances in quantitative model- and impact-based forecasting products;

- Continue to provide support in the transition to the operational phase of the SWFDP project after the demonstration phase has been completed to the developing countries and especially to Least Developed Countries (LDCs);

- Deliver improved forecasts and warnings of severe weather to save lives, livelihoods and property and strengthen interactions with disaster management and civil protection agencies, local communities and the media in service delivery;

- Develop and deliver weather, hydrological and climate services to support policy development, risk analysis, multi-hazard early warning systems, sectoral risk management, and disaster risk financing and insurance;

- Develop regionally tailored applications of space-based observations to weather prediction, climate monitoring and disaster risk reduction;

- Support Members to acquire the qualification and competencies required for effective service delivery through appropriate education and training programmes, with a focus on marine and aviation competencies, leadership and management training, and observations instrumentation;

- Support cooperation between developing and developed Members and full utilization of the WMO Regional Training Centres.

(vii) MHEWS: Strengthen national multi-hazard early warning/alert systems within the region

Focus in 2020-2023:

- Enhance impact- and risk-based forecast and warning products and services to enable better preparedness and response to hydrological and meteorological events;

- Strengthen national capacity in multi-hazard early warnings;
• Contribute to the shaping of the post-2015 framework for disaster risk reduction in Africa.

(viii) **Climate services: Broaden the provision of climate information and services**

**Focus in 2020-2023:**

• Full implementation of Regional and National Framework for Climate Services under the GFCS;

• Completion of the designation of Subregional Climate Centres as WMO RCCs;

• Using Climate Research for Development (CR4D) Agenda to advance Sub-seasonal to Seasonal (S2S) Prediction for RCOFs;

• Improved production and delivery of national climate information products and services;

• Refine products containing key climate indicators, seasonal outlooks, and improved characterization of extremes and associated impact information;

• Define the role and operations of RCCs in the implementation of the GFCS in the regions;

• Generate and deliver more regionally-focused high-resolution data and products; and training and capacity building.

(ix) **Hydrological services: Strengthen services in support of flood forecasting, warning and water management**

**Focus in 2020-2023:**

• Improve hydrological services, forecasts and warnings for water resources, drought and flood risk management and planning;

• Improve hydrological data networks in the region, including enhancement of rain gauge networks;

• Consider the expansion of the Flash Flood Guidance System (FFGS) programme to the remaining parts of Africa.

(x) **Aviation weather services: Strengthen services in support of aviation weather services**

**Focus in 2020-2023:**

• Enhance the capability of Members to deliver weather services to meet the needs of the aviation sector, with a focus on meeting regulatory requirements and addressing the significant deficiencies in aeronautical services in the region;

• Provide NMHSs with further guidance and assistance in the provision of aviation services on a cost recovery basis;

• Strengthen the engagement of regional Members with aviation entities at the national and regional level, with a focus on participation in regional ICAO activities;

• Explore coordinated regional approaches in Africa in response to the evolving Air Traffic Management system and information-centric requirements;

• Improve the mutual awareness and proper integration of the aeronautical meteorology in the national plans for enhancing air traffic management in accordance with the Global Air Navigation Plan (GANP).
(xi) **Marine weather services: Enhance the value and provision of decision-supporting information and services**

**Focus in 2020-2023:**

- Enhance and increase marine weather services by uptake of modern technology in service delivery and quality management principles;
- Identify critical gaps in marine data coverage, and address that through the integrated design of observing networks;
- Enhancement and long-term maintenance of an integrated marine and oceanographic observing and data management system, in collaboration with other appropriate bodies;
- Manage the evolution of an effective and efficient programme through the selective incorporation of advances in meteorological and oceanographic science and technology; and to work to ensure that all countries have the capacity to benefit from and contribute to these advances.

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**Decision 11 (RA I-17)**

**Working structure of RA I**

**Regional Association I (Africa) decides:**

1. To maintain the current subsidiary bodies of the Association except to split one of the Working Groups,
2. To approve the establishment of an additional Working Group,
3. To adopt the Decision 11 (RA I-17),

**Further decides** its subsidiary bodies to be as follows:

(a) Management Group (MG),
(b) Working Group on Observations, Telecommunication and Infrastructure,
(c) Working Group on Climate Services and Applications,
(d) Working Group on Hydrology and Water Resources,
(e) Working Group on Improved Weather Forecasting, Natural Disaster Risk Reduction, Service Delivery and Communication,
(f) Working Group on Compliance Issues in Aeronautical Meteorological Services and Cost Recovery,
(g) Working Group on Marine Meteorological Services and Cost Recovery,
(h) Tropical Cyclone Committee for the South-West Indian Ocean,
(i) Task Team on Aeronautical Meteorology,
(j) Task Team on WIGOS.
Decision justification: Regional Association I established its current Management Group and Working Groups including Task Teams created by Resolutions 8 and 13 (RA I-16). It was also agreed at its Management Group sessions to create an independent working group on marine services for effective and effective service delivery to save lives and property at sea.

Annex to Decision 11 (RA I-17)

Working structure of the Management Group and Working Groups and Task Team

With regard to the working structure of the Association, the following general principles were considered:

(a) The work structure of the Association has been considered and aligned with the Expected Results of the WMO Strategic Objectives and long-term goals for 2020–2023, to ensure a consistent approach in the implementation of the WMO Programmes;

(b) The overall goal of the established work structure is the implementation of the regional aspects of the WMO Strategic Plan. Therefore, the resources should be used in accordance with the established key regional priorities and expected results;

(c) The work programmes of the working groups consist of specific tasks designed to implement the regional aspects of the WMO Strategic Plan over the intersessional period. The working groups have the flexibility to propose to the MG the establishment of a manageable number of task teams to address specific tasks, as necessary, for the progress of the work programmes; and

(d) Cross-cutting issues are addressed through coordination and collaboration between the working groups, each of them providing the necessary expertise. The MG facilitates the coordination process.

Considering the above general principles, the Association agreed on the subsidiary bodies listed below, for the next intersessional period.

(a) Management Group (MG)

Eleven (11) Members with an option to invite the EC Members:

(i) The president of RA I (Chairperson of MG);

(ii) The vice-president of RA I;

(iii) Regional Hydrological Advisor to the president of RA I (also chairperson of the Hydrology and Water Resource Working Group, preferably a Permanent Representative);

(iv) Gender Coordinator (to consider the gender dimension of weather and climate services and ETR matters);

(v) Chairpersons of WGs, who are preferably Permanent Representatives and TCC.

The Regional Association decided to invite the president to act as chairperson of the Management Group; the Management Group may invite experts of RA I to participate in their meetings depending on the need for such expertise.

Financial Implication: Considering one meeting (of 3 days) per year for 11 Members of the MG (4 plus 7 chairpersons) during the intersessional period (4 years).
Total expenditure = 4 meetings [11 Members (3 days of DSA + travel)].

It should be more cost-effective to have Working Group (WG) chairpersons who are Permanent Representatives as part of the Management Group (MG) with the possibility for the president to invite EC Members as appropriate.

Options for MG meetings can be realized with cost-savings if organized on the margins of the WMO EC session.

(b) Working Group on Observations, Telecommunication and Infrastructure:

(i) Experts of Task Team on WIGOS (created by Resolution 8 (RA I-16));

(ii) Experts on WMO Information System (WIS), including the Chairperson of RA I WIS Implementation Team;

(iii) Two (2) Experts on Instruments and Methods of Observation (CIMO): one specializing in Conventional Observation Systems and the other in Remote Systems;

(iv) Experts on Regional Telecommunications; and

(v) Experts from RA I Dissemination Expert Group (RAIDEG) on satellite data.

(c) Working Group on Climate Services and Applications:

(i) Expert on Climate and Data Management;

(ii) Expert on Climate Prediction from seasonal to decadal;

(iii) Expert on Agricultural Meteorology;

(iv) Expert on Climate Variability / Change, and Modelling; and

(v) Expert on Climate and Health.

(d) Working Group on Hydrology and Water Resources:

(i) Expert on hydrological prediction and forecasting;

(ii) Expert on integrated water resource management, development and service delivery;

(iii) Expert on hydrological monitoring and data management;

(iv) Expert on water and climate; and

(v) Expert on integrated high / low flow forecasting.

(e) Working Group on Improved Weather Forecasting, Natural Disaster Risk Reduction, Service Delivery and Communication:

(i) Expert on disaster prevention and mitigation;

(ii) Expert on marine meteorological and oceanographic services;

(iii) Expert on advancement, operation and application of numerical weather prediction (NWP), from nowcasting to medium range forecast; and

(iv) Expert on integrated service delivery, including public weather (media, social science, communication, etc.).
(f) **Working Group on Compliance Issues in Aeronautical Meteorological Services and Cost Recovery**

(i) Expert on aeronautical meteorological services;

(ii) Expert on QMS including compliance to ICAO requirements and associated competences;

(iii) Expert on cost recovery from aviation,

(iv) Experts on human capital (capacity, development, retention, career path, etc..) issues.

(g) **Working Group on Marine Meteorological Services and Cost Recovery**

(i) Expert on marine meteorological services

(ii) Expert on quality management systems including compliance with marine and oceanographic requirements and associated competences;

(iii) Expert on cost recovery from marine,

(iv) Experts on human capital (capacity, development, retention, career path, etc..) issues.

(h) **Tropical Cyclone Committee for the South-West Indian Ocean: 15 members of the Committee drawn from the Member countries most affected by the South-West Indian Ocean Tropical Cyclones.**

(i) **Task Team on Aeronautical Meteorology. Nominated by the president to have subregional representation**

(j) **Task Team on WIGOS. Nominated by the president to have subregional representation**

Terms of Reference (ToRs) to be agreed by the president of RA I in consultation with RA I MG (list of TORs to be prepared by the MG.

Considering two meetings of 3 days in the intersessional period of RA I sessions, the financial expenditure for the six (6) WGs assuming their meeting is in Geneva is as follows:

Financial Implications: Number of Members of the Working Groups (WGs):

(a) WG on Observations, Telecommunication and Infrastructure (10);

(b) WG on Climate Services and Applications (5);

(c) WG on Hydrology and Water Resources (5);

(d) WG on Improved Weather Forecasting, Natural Disaster Risk Reduction, Service Delivery and Communication (10);

(e) Working Group on Compliance Issues in Aeronautical Meteorological Services and Cost Recovery (5);

(f) Working Group Marine Meteorological Services and Cost Recovery (5);

(g) Tropical Cyclone Committee for the South-West Indian Ocean (15);

(h) Task Team on Aeronautical Meteorology (5)

(i) Task Team on WIGOS (5)
Total expenditure = 2 meetings [50 Members (3 days DSA + travel)].

Depending on availability of resources and needs, a WG may meet more than 2 times during the intersession period.

As financial resources are constraint, the association strongly encouraged to do as far as possible the work through remotely (internet, webex, skype, ...)

The Association agreed to continue to maintain the RA I subsidiary bodies.

1. MANAGEMENT GROUP

(a) Membership

(i) RA I president;

(ii) RA I vice-president;

(iii) Chairpersons of Working Groups who are preferably Permanent Representatives and the Chair of Tropical Cyclone Committee;

(iv) Hydrological Advisor to the president; preferably a Permanent Representative

(v) Gender Coordinator;

(vi) RA I Members of the Executive Council and other experts may be invited by the president, as appropriate;

(b) Terms of reference (ToR)

(i) To discuss matters related to the work of the Association, including emerging matters or matters requiring the adoption of actions that could not be postponed until the following regular session of the Association;

(ii) To plan and coordinate the work of the Association and its subsidiary bodies;

(iii) To ensure that priorities are addressed, and to advise on the appropriate arrangements to achieve results according to the Strategic Plan for the enhancement of National Meteorological and Hydrological Services (NMHSs) in WMO Regional Association I (Africa) and the Regional Operating Plan;

(iv) To select the members of the working groups and appoint chairpersons of the working groups, preferably Permanent Representatives from nominations provided by Members of the Association;

(v) To establish and review the structure and work of the subsidiary bodies of the Association, including the implementation of its recommendations, and to disband or reorganize the bodies as may be required;
(vi) To invite the president and the Management Group to develop the terms of reference for the working groups and task teams, taking into account the priority areas provided by the Association and in consultation with appropriate technical departments of WMO;

(vii) To collaborate with the WMO Secretariat in the mobilization of resources, and to advise on the way to align resources with regional priorities and the implementation of the Operating Plan;

(viii) To coordinate and monitor the implementation of the Strategic Plan for the enhancement of the National Meteorological and Hydrological Services in Regional Association I (Africa), and to provide the contribution of Region I to the WMO Strategic Plan;

(ix) To finalize the RA I Operating Plan for the remainder of the sixteenth financial period based on the discussions during the seventeenth session of the Association and taking into account input from the Members of the Association, and to develop a Regional Operating Plan for the seventeenth financial period (2020–2023);

(x) To address other issues as they arise, including strengthening of strategic partnerships with regional organizations, development agencies and other stakeholders.

2. WORKING GROUPS

(a) Working Group on Observations, Telecommunication and Infrastructure:

(i) Experts on WMO Integrated Global Observing Systems, including the chairperson of the RA I WMO Information System Implementation Team;

(ii) Experts on the WMO Information System;

(iii) Two experts on Instruments and Methods of Observation, one specializing in conventional observation systems and the other in remote systems;

(iv) Experts on regional telecommunications;

(v) Experts from the RA I Dissemination Expert Group (RAIDEG) on satellite data;

(b) Working Group on Climate Services and Applications:

(i) Expert on climate and data management;

(ii) Expert on climate prediction from seasonal to decadal;

(iii) Expert on agricultural meteorology;

(iv) Expert on climate variability/change and modelling;

(v) Expert on climate and health;
(c) Working Group on Hydrology and Water Resources:

(i) Expert on hydrological prediction and forecasting;

(ii) Expert on integrated water resource management, development and service delivery;

(iii) Expert on hydrological monitoring and data management;

(iv) Expert on water and climate;

(v) Expert on integrated high/low flow forecasting;

(d) Working Group on Improved Weather Forecasting, Natural Disaster Risk Reduction, Service Delivery and Communication

(i) Expert on disaster prevention and mitigation;

(ii) Expert on marine meteorological and oceanographic services;

(iii) Expert on advancement, operation and application of numerical weather prediction, from nowcasting to medium-range forecast;

(iv) Expert on integrated service delivery, including Public Weather Services;

(e) Working Group on Compliance Issues in Aeronautical Meteorological Services and Cost Recovery:

(i) Expert on aeronautical meteorological services;

(ii) Expert on quality management systems including compliance with International Civil Aviation Organization (ICAO) requirements and associated competences;

(iii) Expert on cost recovery from aviation;

(iv) Experts on human capital (capacity, development, retention, career path, etc.) issues;

(f) Working Group on Marine Meteorological Services and Cost Recovery:

(i) Expert on marine meteorological services;

(ii) Expert on quality management systems including compliance with marine and oceanographic requirements and associated competences;

(iii) Expert on cost recovery from marine;
(iv) Experts on human capital (capacity, development, retention, career path, etc.) issues;

(g) Tropical Cyclone Committee for the South-West Indian Ocean:

15 members of the Committee drawn from the Member countries most affected by the South-West Indian Ocean Tropical Cyclones;

3. TASK TEAMS:

Task Team on Aeronautical Meteorology;

Task Team on WIGOS;
APPENDIX 4. LIST OF PARTICIPANTS

1. Officers of the session
   Daouda KONATE President of RA I
   Ahmed Mohamed ABDELAAL Vice-president of RA I

2. WMO Members within RA I

   Benin
   Edgar Pierre Roch QUENUM Principal Delegate
   Kokou Marcellin NAKPON Alternate
   Edgard Pierre ROCH Delegate
   Burkina Faso
   Kouka Ernest OUEDRAOGO Principal Delegate

   Burundi
   Augustin NGENZIRABONA Principal Delegate

   Central African Republic
   Athanase Hyacinthe Anaclet YAMBELE Principal Delegate

   Congo
   Hilaire ELENGA Principal Delegate
   Nangho SERGE LOUIS Delegate

   Côte d’Ivoire
   Diderot Joce BION Principal Delegate
   Daouda KONATE Alternate
   Bernard KOUAKOU DJE Delegate

   Democratic Republic of the Congo
   Jean Pierre MPUNDU ELONGA Principal Delegate

   Egypt
   Ahmed Mohamed ABDELAAL Principal Delegate
   Ibrahim ATTA Delegate
   Mohamed TAWFIK Delegate

   Eswatini
   Duduzile NHLENGETHWA-MASINA (Ms) Principal Delegate

   Ethiopia
   Fetene TESHOME Principal Delegate

   France
   Laurence FRANCHON (Ms) Principal Delegate
   Patrick BENICHOU Delegate
   Alexis COURBIERE Delegate

   Gambia
   Lamin Mai TOURAY Principal Delegate

   Guinea
   Mamadou Lamine BAH Principal Delegate

   Guinea-Bissau
   João LONA TCHEDNÁ Principal Delegate

   Kenya
   Stella Odero AURA (Ms) Principal Delegate
   Nicholas MAINGI Delegate
APPENDIX 4. LIST OF PARTICIPANTS

United Kingdom of Great Britain and Northern Ireland
Jane WARDLE (Ms) Principal Delegate
Karen MCCOURT (Ms) Alternate
Adam CURTIS Delegate
Jeremy TANDY Delegate

United Republic of Tanzania
Agnes KIJAZI (Ms) Principal Delegate
Ismail Mbwana KASSIM Delegate
Wilbert MURUKE Delegate
Tunsume Gideon MWAMBONEKE (Ms) Delegate
FAISWARY Faiswary RWEYEMAMU Delegate

Zambia
Emmanuel SIKANA Principal Delegate

Zimbabwe
Rebecca MANZOU (Ms) Principal Delegate
Tichaona ZINYEMBA Delegate

3. WMO Members outside RA I

China
Xiaoping HU Observer

Republic of Korea
Heungjin CHOI Observer
Byunghyun SONG Observer

Saudi Arabia
Abubakr BA QAZI Observer
Mohammed BABAIDAN Observer
Ayman Salem GHULAM Observer
Yasser H. KHALLAF Observer

United States of America
William Carl BOLHOFER Observer
Wassila Mamadou THIAW Observer

4. Representatives of international organizations and other bodies

Permanent Interstate Committee for Drought Control in the Sahel (CILSS)
Seydou TRAORE Observer

GMV
Carlos DOMENECH Observer

International Civil Aviation Organization (ICAO)
M. SMAOUI Observer

International Commission on Irrigation and Drainage (ICID)
Mohamed A. Shehata WAHBA Observer

League of Arab States
Ashraf SHALABY Observer

5. Presidents of constituent bodies and Chairs of other bodies

WMO
David GRIMES President
6. Regional hydrological advisors
   Ashraf ZAKEY
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