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World Meteorological Organization Organisation météorologique mondiale Organización Meteorológica Mundial Всемирная метеорологическая организация 山北道山上重 比和公司名 Secrétariat 7 bis, avenue de la Paix – Case postale 2300 CH 1211 Genève 2 – Suisse Tél.: +41 (0) 22 730 81 11 Fax: +41 (0) 22 730 81 81 wmo@wmo.int – public.wmo.int

13 December 2021

Annexes.: 2

Our ref.:

Subject: Implementation of WMO Regional Climate Centre Network (RCC-Network) for the South West Indian Ocean (SWIO) region

Action required: To provide feedback on requirements and capabilities for RCC Services for the SWIO region and to nominate a focal point from your Service to deal with RCC-related matters and to participate in the Scoping Workshop

Dear Sir/Madam,

Noting the recommendations of the Regional Consultation on Climate Services for the Indian Ocean Islands (Mauritius, 14–16 March 2016) on establishing a Regional Climate Outlook Forum (RCOF) and a Regional Climate Centre (RCC) focused on the special needs of the SWIO region, WMO Regional Association I, at its seventeenth session (2019), endorsed the proposal to adopt a regional approach to Climate Services Information System (CSIS) implementation with subregional focus on seven geographical domains, including the southwest Indian Ocean.

WMO Regional Climate Centres (RCCs) are centres of excellence that create regional climate products including long-range forecasts in support of regional and national climate activities, serving primarily the National Meteorological and Hydrological Services (NMHSs) within the RCC's region of interest and thereby strengthening the capacity of WMO Members to deliver better climate services to national users.

Functions and relevant designation criteria of WMO RCCs are defined in the *Manual* on *Global Data Processing and Forecasting System (GDPFS)*, (WMO No. 485). The concept of WMO RCCs provides adequate flexibility to accommodate specific regional climate service needs and limitations.

I kindly request you to complete the survey in Annex 1 and send it by **10 January 2022** to Ms Anahit Hovsepyan (ahovsepyan@wmo.int), Scientific Officer, Regional Climate Prediction Services (RCP) Division, indicating your country's interest in using, and capacities in delivering, RCC-related services or carrying out research to develop relevant capacities for the SWIO region. This survey is based on the functions and criteria provided in the Manual on GDPFS. While completing the survey, I would also encourage you to consider the potential roles of the NMHS, and other relevant national and international institutions hosted by your country (if applicable), in contributing to RCC operations.

The outcome of this survey will be used to define the possible structure and develop a draft implementation plan for the SWIO RCC/RCC-Network in close consultation with the SERCOM Expert Team on CSIS Operations (ET-CSISO) and the WMO Secretariat.

To: Permanent Representatives of Comoros, France, Madagascar, Malawi, Mauritius, Mozambique, Seychelles, South Africa and Tanzania with WMO (limited distribution)

Furthermore, WMO Members in the SWIO region that have indicated an interest, via the survey response, in contributing to the SWIO RCC/RCC-Network operation, either as a node lead or as a consortium member, will be invited to participate in the Scoping Workshop on the SWIO Regional Climate Centre Network Implementation to be held online during the second half of January 2022 (dates to be confirmed in due course) (see the Concept Note in Annex 2). I therefore invite you to nominate a focal point from your Organization to deal with RCC-related matters and to participate in the Scoping Workshop.

For more information, you may contact Mr Wilfran Moufouma Okia (wmokia@wmo.int) Chief, RCP Division and Ms Anahit Hovsepyan (ahovsepyan@wmo.int), Scientific Officer, RCP Division at the WMO Secretariat, with a copy to Mr Jean-Pierre Ceron (jpceron.wmo@gmail.com) representative of ET-CSISO.

I take this opportunity to thank you for your continued cooperation and support to the WMO activities.

Yours faithfully,

Hallteen

Dr Elena Manaenkova for the Secretary-General

SURVEY OF WMO MEMBERS IN THE SWIO REGION ON THEIR NEEDS AND CAPACITIES FOR RCC SERVICES IN THE SWIO REGION

PART A

Mandatory Functions for Designation as a WMO RCC or RCC-Network

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Requirement/Function	Does your country require this activity to be performed or coordinated by an RCC focused on the SWIO region? (Yes/No) ¹	Does your country provide relevant services or carry out research to enable such services for the SWIO region? (Yes/No)	Is your country interested in contributing to this function of an RCC for the SWIO region? (Yes/No)
Operational Activities for Long-Range Forecasts (LRF)			
Interpret and assess relevant LRF products from Global Producing Centres of LRF (GPC-LRFs), distribute relevant information to RCC Users; and provide feedback to GPC-LRFs			
Generate regional and subregional tailored products, relevant to RCC User needs, including seasonal outlooks etc.			
Generate consensus statement on regional or subregional forecasts			
Perform verification of RCC quantitative LRF products, including the exchange of basic forecasts and hindcast data			
Provide online access to RCC products/services to RCC Users			
Assess use of RCC products and services through feedback from RCC Users			
Operational Activities for Climate Monitoring			
Perform climate diagnostics including analysis of climate variability and extremes, at regional and subregional scales			
Establish an historical reference climatology for the region and/or subregions			
Implement a Regional Climate Watch			

¹ Please provide additional explanatory information on a separate sheet, if required.

Requirement/Function	Does your country require this activity to be performed or coordinated by an RCC focused on the SWIO region? (Yes/No) ¹	Does your country provide relevant services or carry out research to enable such services for the SWIO region? (Yes/No)	Is your country interested in contributing to this function of an RCC for the SWIO region? (Yes/No)
Operational Data Services, to support operational LRF and climate monitoring			
Develop quality controlled regional climate datasets, gridded where applicable			
Provide climate database and archiving services, at the request of NMHSs			
Training in the use of operational RCC products and services			
Provide information on methodologies and product specifications for mandatory RCC products, and provide guidance on their use			
Coordinate training for RCC Users in interpretation and use of mandatory RCC products			

NOTE: Reflect true capacity to deliver the function, in consideration of the required human resources, computing and telecommunications capacities including equipment, power, hardware, software, etc. and other infrastructure requirements, and also mandate of the organization.

PART B

Highly Recommended Functions for WMO RCCs and RCC-Networks

Requirement/Function	Does your country require this activity be performed or coordinated by an RCC focused on the SWIO region? (Yes/No)	Does your country provide relevant services or carry out research to enable such services for the SWIO region? (Yes/No)	Is your country interested in contributing to this function of a an RCC for the SWIO region? (Yes/No) ²
Climate Predictio	on and Climate Pr	ojection	
Assist RCC Users in the access and use of WCRP-CMIP climate model simulations			
Perform downscaling of climate change scenarios			
Provide information to RCC Users for use in development of climate adaptation strategies			
Generate, along with warnings of caution on accuracy, seasonal forecasts for specific parameters where relevant, such as: onset, intensity and cessation of rainy season; tropical cyclone frequency and intensity			
Perform verification on consensus statements for forecasts;			
Perform assessment of other Global Producing Centres (GPC) products such as sea-surface temperature, winds, etc.			
Non-operational data services			
Keep abreast of activities and documentation related to WMO Information System (WIS), and work towards WIS compliance and Data Collection or Production Centres (DCPC) designation;			
Assist NMHSs in the rescue of climate data from outmoded storage media;			
Assist NMHSs to develop and maintain historical climate datasets;			

 $^{^2}$ $\,$ Where appropriate, indicate in this column the priority from your perspective as High (H), Medium (M) or Low (L).

Requirement/Function	Does your country require this activity be performed or coordinated by an RCC focused on the SWIO region? (Yes/No)	Does your country provide relevant services or carry out research to enable such services for the SWIO region? (Yes/No)	Is your country interested in contributing to this function of a an RCC for the SWIO region? (Yes/No) ²
Assist RCC Users in the development and maintenance of software modules for standard applications;			
Advise RCC Users on data quality management;			
Conduct data homogenization, and advise RCC Users on homogeneity assessment and development and use of homogeneous data sets;			
Develop and manage databases, and generate indices, of climate extremes;			
Perform Quality Assurance/Quality Control on national datasets, on request of an NMHS;			
Provide expertise on interpolation technique;			
Facilitate data/metadata exchange amongst NMHSs, including online access, through an agreed regional mechanism;			
Perform Quality Assurance, Quality Control on regional datasets			
Coordir	nation Functions	,	
Strengthen collaboration between NMHSs on related observing, communication and computing networks including data collection and exchange;			
Develop systems to facilitate harmonization and assistance in the use of LRF products and other climate services;			
Assist NMHSs in user liaison, including the organization of climate and of multidisciplinary workshops and other forums on user needs;			
Assist NMHSs in the development of a media and public awareness strategy on climate service			

Requirement/Function	Does your country require this activity be performed or coordinated by an RCC focused on the SWIO region? (Yes/No)	Does your country provide relevant services or carry out research to enable such services for the SWIO region? (Yes/No)	Is your country interested in contributing to this function of a an RCC for the SWIO region? (Yes/No) ²
Training and Capacity building			
Assist NMHSs in the training of users on the application and on implications of LRF products on users;			
Assist in the introduction of appropriate decision models for end users, especially as related to probability forecasts;			
Promote technical capacity building on NMHS level (e.g. acquisition of hardware, software, etc.), as required for implementation of climate services;			
Assist in professional capacity building (training) of climate experts for generating user-targeted products			
Research and Development			
Develop a climate Research and Development agenda and coordinate it with other relevant RCCs;			
Promote studies of regional climate variability and change, predictability and impact in the Region;			
Develop consensus practices to handle divergent climate information for the Region;			
Develop and validate regional models, methods of downscaling and interpretation of global output products;			
Promote the use of proxy climate data in long-term analyses of climate variability and change;			
Promote application research, and assist in the specification and development of sector specific products;			
Promote studies of the economic value of climate information			

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NOTE: Reflect true capacity to deliver the function, in consideration of the required human resources, computing and telecommunications capacities including equipment, power, hardware, software, etc. and other infrastructure requirements, and also mandate of the organization.

If the country is interested in contributing to the SWIO RCC-Network implementation, please indicate contact details of a national focal point, who will also contribute to and/or participate in the Scoping Workshop:

Name:	
Institution:	
Position:	
Email:	
Phone:	





CONCEPT NOTE SCOPING WORKSHOP ON IMPLEMENTATION OF A REGIONAL CLIMATE CENTRE IN THE SWIO REGION

VIRTUAL MEETING

xx-xx January 2022 [TBC]

Background:

In the light of the enormous challenges climate variability and climate change pose to societies, there is an urgent need to enable WMO Members to provide the best possible climate services in support of climate risk management and adaptation. And, climate relevant processes have strong interscale linkages going beyond borders of individual countries.

As global-scale information provided by GPCs (coarse in terms of resolution and reflected features) is typically not sufficient for national-scale services, the concept of WMO Regional Climate Centres was developed to bridge the gap between information at the global and national scales. Moreover, up-to-date climate services require, among others, appropriate computer power, modelling capacities and special expertise, to which not all WMO Members currently have adequate access. In this respect, WMO RCCs offer excellent opportunities for networking and pooling the capacities of National Meteorological and Hydrological Services (NMHSs) in a region in order to enable them to provide the full suite of climate services to meet national needs.

RCC Concept:

RCCs are centres of excellence that operationally generate regional climate products including climate monitoring and prediction in support of regional and national climate activities and thereby strengthen the capacity of WMO Members in a given region to deliver better climate services to national users. The RCCs are designed to assist NMHSs to carry out their mandate, while service delivery to national users remains in the purview of national institutions.

WMO RCCs are required to fulfil mandatory functions and highly recommended functions defined in the Manual on Global Data Processing and Forecasting System (GDPFS). Meanwhile, the RCC concept includes flexibility to accommodate specific regional needs, capabilities and limitations. The RCCs can be implemented as a single multifunctional centre or as an RCC-Network group of centres collectively performing all the required functions of an RCC. Mandatory and recommended functions of WMO RCCs and the relevant designation criteria are part of the WMO Technical Regulations. Further details related to RCCs are available at https://public.wmo.int/en/our-mandate/climate/regional-climate-centres. The potential RCC functions for SWIO region would be based on:

Mandatory Functions:

- Operational activities for long-range forecasts (LRF)
- Operational activities for climate monitoring
- Operational data services to support LRF and climate monitoring
- Training in the use of operational RCC products and services

Highly Recommended Functions:

- Climate prediction and climate projection
- Non-operational data services
- Coordination functions
- Training and capacity development
- Research and development

The RCCs play a key role in facilitating, inter alia:

- Strengthened collaboration among NMHS in the SWIO region and potentially beyond
- Specific regional products such as sub-seasonal and seasonal prediction
- Development of sector specific products including regional users
- Activities for user engagement such as national climate outlook forums, during which users of RCC products can learn about the products

Regional approach for Climate Services in the SWIO region

Countries of the SWIO region have many similarities/common features, both geographically and climatically: they are tropical islands with a marked topography, maritime influences and extreme weather events such as intense precipitation and tropical cyclones. And most of the hazards that the islands of this region are facing are also impacting the countries of the eastern coast of Africa (south of the equator). Due to these geographical and climatic similarities, the states of the SWIO region and the countries of the eastern coast of Africa share a quite similar vulnerability to natural climate variability and climate change.

An understanding of regional and local climates and their relationship to larger-scale climate variability, the study of predictability at seasonal timescales, the preparation of adapted climate products and their use are among challenges that the region needs to address (ACClimate project under the responsibility of the Indian Ocean Commission (IOC)).

The proposal for a regional climate forum on seasonal forecasting for the countries of the South West Indian Ocean region (SWIOCOF) was raised during regional workshops under the project ACClimate on the adaptation of the IOC countries to climate change. A special session on the subject was also held in Mauritius in March 2011 at the Western Indian Ocean Marine Science Association (WIOMSA) conference, where all the countries unanimously expressed their interest in setting up a regional climate forum. It is also noted that several countries of the SWIO region already involved in other forums (Southern African Regional Climate Outlook Forum (SARCOF) and Greater Horn of Africa Climate Outlook Forum (GHACOF)) consider that these forums rather dedicated to continental Africa, do not respond adequately to their expectations. Therefore, a SWIO Climate Outlook Forum (SWIOCOF) was established in September 2012 and was convened annually to produce a regional seasonal outlook.

There has been a strong regional interest in the SWIO region to work together and help users to benefit from the climate science and the products tailored to their specific needs.

However, since an RCC has not been established for the SWIO region, a regional coordination has been provided by the IOC, and there are also potential candidates and interested partners that could contribute to the establishment of an RCC for the SWIO region. Furthermore, the capacities of the NMHSs on the provision of climate services are still heterogeneous, despite the capacity development activities provided as part of SWIOCOF. The countries would undoubtedly benefit from regional services and products provided by a Regional Climate Centre or an RCC-network, which will facilitate sharing knowledge, tools and technical capacities.

Scoping Workshop on RCC implementation in the SWIO region

It is therefore proposed to organize a Scoping Workshop on the implementation of an RCC for the SWIO region. Due to travel restrictions related to the ongoing global pandemic the Workshop will be conducted online during the second half of January 2022 (tbc).

As part of preparation of the Workshop a survey of Members in SWIO region will be conducted to identify the needs and capacities as well as the interests to contribute to the RCC.

Objectives:

The Scoping Workshop will facilitate the engagement of the operational, users and research communities to take the first steps towards development of an implementation strategy for a SWIO RCC, including the possibility of it taking the form of a SWIO RCC-Network, by;

- 1. Exploring opportunities and challenges related to climate monitoring and prediction services and the underpinning data inputs;
- 2. Discussing the RCC concept including the priority functions of the RCC and the implementation strategy;
- 3. Exploring the potential contributions of each of the participating countries;
- 4. Honing the potential synergy/coordination with the existing RCCs with overlapping domain (e.g. SADC CSC (under consideration) and RCC-IGAD (designated) ICPAC).

Expected outcomes:

- 1. Scoping of the SWIO RCC concept and implementation:
 - (a) List of priority RCC functions;
 - (b) Description of the RCC implementation strategy including the structure of the SWIO RCC or RCC-Network, coordination aspects;
- 2. Identification of Member capacities and interest to deliver RCC products and services;
- 3. Recommendations on the next steps for establishing a SWIO RCC/RCC-network.

Participants:

The Workshop will bring together representatives from the IOC secretariat, from NMHSs of WMO Members in the SWIO region: Seychelles, Mauritius, Comoros, Madagascar, La Réunion, and the African countries participating to the SWIOCOF: Malawi, Mozambique, South Africa and Tanzania. The representatives from relevant regional organizations such as SADC, ICPAC ACMAD and the RCC Pune would also be invited. Experts from relevant Expert Teams of WMO Technical Commissions, e.g. ET-CSISO, ET-CID/SC-CLI/SERCOM, ET-OCPS/SC-ESMP/INFCOM, relevant subsidiary bodies of Regional Associations I & II, and from relevant units of WMO Secretariat (RCP, CMP) will complement the participants list.

Key Agenda Items³:

- 1. Background: the RCC concept at a glance;
- 2. The SWIO context: Summary of opportunities and challenges related to SWIO region climate monitoring and prediction services, and to underpinning data;
- 3. Product Development and Service Delivery;
- 4. National Capabilities and Initiatives;
- 5. Summary of survey results: needs, expectations and willingness to contribute to RCC Mandatory functions, Climate Data, Climate Monitoring, Long-Range Forecasting, Capacity Building/Trainings;
- 6. Structure of the proposed RCC and associated governance/coordination;
- 7. SWIO RCC implementation roadmap and way forward.

³ Provisional agenda is under development and will be provided to participants in due course