WEATHER CLIMATE WATER
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WMO OMM
World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
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Annexe: 1 (disponible en anglais seulement)

Objet: Plan de mise en œuvre du Centre climatologique régional (CCR) en réseau pour le sud-ouest de l'océan Indien

Suite à donner: Donner votre avis sur le plan de mise en œuvre susmentionné et confirmer la participation de votre Service aux opérations dudit CCR en réseau, de préférence d'ici le **25 novembre 2024**

Madame, Monsieur,

L'OMM a encouragé le développement du concept de CCR et de CCR en réseau et l'établissement de tels centres dans le monde entier, car ils représentent l'un des moteurs de la mise en place au niveau régional du Système d'information sur les services climatologiques (SISC), lequel est une composante du Cadre mondial pour les services climatologiques (CMSC).

À sa dix-septième session, le Conseil régional I de l'OMM (Afrique) a adopté la résolution 6 (CR I-17) – Mise en œuvre du Système d'information sur les services climatologiques à l'échelle régionale, au titre de laquelle il a approuvé la mise en place du SISC sous l'angle régional, en mettant l'accent à l'échelle sous-régionale sur sept domaines géographiques, y compris le sud-ouest de l'océan Indien. Le CCR en réseau pour le sud-ouest de l'océan Indien offrira d'excellentes possibilités de réseautage et de mise en commun des capacités des Services météorologiques et hydrologiques nationaux (SMHN) afin de permettre à ces derniers de fournir l'ensemble des services climatologiques requis pour répondre aux besoins nationaux. Par conséquent, l'OMM a engagé des démarches en vue de la création d'un CCR en réseau pour le sud-ouest de l'océan Indien.

À la suite d'un atelier de cadrage en ligne sur l'établissement d'un tel CCR, tenu en 2022, et avec la contribution précieuse des Membres du sud-ouest de l'océan Indien, un projet de plan de mise en œuvre a été élaboré. J'ai le plaisir de partager ce plan avec vous (voir l'annexe) pour que vous l'examiniez promptement.

Je vous saurais gré de bien vouloir communiquer vos commentaires sur le plan et de confirmer la participation de votre Service à la mise en place et à l'exploitation du CCR en réseau pour le sud-ouest de l'océan Indien par courriel à Mme Anahit Hovsepyan (ahovsepyan@wmo.int), Fonctionnaire scientifique de la Section des services régionaux de prévision du climat de l'OMM, et à M. Jean-Pierre Céron (jpceron.wmo@gmail.com), Consultant de l'OMM pour le CCR en réseau pour le sud-ouest de l'océan Indien, dans les meilleurs délais, et de préférence d'ici le **25 novembre 2024**.

En vous remerciant de votre soutien constant et de votre précieuse participation aux activités de l'OMM, je vous prie d'agréer, Madame, Monsieur, l'expression de ma considération distinguée.

Celeste Saulo
Secrétaire générale

Aux: Représentants permanents des Membres de l'OMM suivants: Afrique du Sud, Comores, France, Madagascar, Malawi, Maurice, Mozambique, République-Unie de Tanzanie et Seychelles (distribution restreinte)

cc: Conseillers en hydrologie
Président du Conseil régional I

South-West Indian Ocean Regional Climate Centre-Network
Implementation Plan (draft)

1. Introduction

The document describes the approach to establish a WMO South-West Indian Ocean Regional Climate Centre Network (SWIO RCC-Network).

WMO RCCs are Centres of Excellence designated to create regional climate products, including data, monitoring, and forecasting, to support and strengthen the capacity of WMO members in a given region to deliver climate services. They play a critical role in the implementation of the Climate Services Information System (CSIS) on regional scale as part of the Global Framework for Climate Services. WMO RCCs are part of the WMO Integrated Processing and Prediction System (WIPPS) and, hence, should follow standard practices and procedures.

The primary "clients" of an RCC are National Meteorological and Hydrological Services (NMHSs) in the region and in neighboring areas. RCC responsibilities should be regional in nature and not duplicate or replace services provided by NMHSs. RCCs serve the regional level of a three-level climate-related infrastructure: Global Producing Centres (GPCs, global level), Regional Climate Centres (RCCs, regional level), and NMHSs (national level). According to the Manual on the WIPPS (WMO-No. 485) and further detailed in the Guide to WIPPS, *a group of centres performing climate- related activities that collectively fulfil all the required functions of an RCC may be designated by WMO as a "WMO Regional Climate Centre Network'. Each centre in a designated WMO RCC Network will be referred to a 'node'. A node will perform, for the region or sub-region defined by the Regional Association, one or several of the mandatory RCC activities. Each of the nodes should have a lead organization and the RCC-Network as a whole requires a 'point of contact'.*

2. Background

The proposal for establishing a WMO Regional Climate Outlook Forum (RCOF) on seasonal forecasting for the countries of the South-West Indian Ocean region was raised during regional workshops under the project ACClimate on adaptation of IOC countries to climate change. A special session was also held in Mauritius, in March 2011, at the Western Indian Ocean Marine Science Association (WIOMSA) conference, where all countries unanimously expressed interest in setting up an RCOF. It was also noted that other RCOFs, such as the South African Regional Climate Outlook Forum (SARCOF) and the Greater Horn of Africa Climate Outlook Forum (GHACOF), rather dedicated to continental Africa, do not respond adequately to SWIO expectations. Therefore, a SWIO Climate Outlook Forum (SWIOCOF) involving all countries from the SWIO region (island countries and countries from the eastern coast of the African continent) was established in September 2012 and was convened annually to produce a regional seasonal outlook.

Many efforts have been done to help communities to address the climate services challenges through the implementation of projects and RCOF in the region. To pursue these efforts in building resilience, it was proposed to establish a WMO RCC for the SWIO region, which will offer excellent opportunities for networking and pooling the capacities of NMHSs to enable them to provide the full suite of climate services to meet national needs. However, since an RCC has not been established for the SWIO region, to start with, the regional coordination used for the SWIOCOF has been provided, and there are also potential candidates and interested partners that could contribute to the establishment of an RCC for the SWIO region.

During the RA I 17th session (Cairo, Egypt, 21-23/02/2019), two important decisions were approved directly related to the SWIO RCC implementation. In particular, the Decision 2 (RA I-17) on the implementation and coordination of RCCs operations in Africa. The expectation for a SWIO RCC is explicitly mentioned. The second one is Decision 6 (RA I-17) about the regional

approach for the implementation of a Climate Service Information System. Indeed, RCCs are key elements on for the implementation of the CSIS at the regional level and the implementation of a RCC in the SWIO region will greatly contribute to this CSIS regional implementation.

Consequently, to explore the rationale and opportunities for establishing an RCC in SWIO region as well as to identify needs and challenges related to climate monitoring, prediction, service delivery and the underpinning data inputs, WMO, in collaboration with the Expert Team on Climate Services Information System Operations (ET-CSISO) of the WMO Services Commission, and IOC, organized a virtual Scoping Workshop Toward Implementing an RCC-Network for the SWIO Region which was preceded by a survey of SWIO Members on the needs and capacities for RCC Services initiated by the WMO Secretariat.

This virtual Scoping Workshop was held on 15-17 March 2022, with engagement of the national representatives of SWIO WMO Member countries (meaning the island countries and countries from the Eastern coast of Africa South to the equator), as well as from IOC, the ET-CSISO and WMO Secretariat. The conclusion of the workshop was then incorporated in a concept note dedicated to an RCC-network in the SWIO region which was prepared for and discussed at the SWIOCOF 11 (September 2022 – Seychelles). This concept note was then disseminated to all the PRs of the potential contributing countries including first the proposed structure for the RCC (RCC-Network and its nodes) and second the annexes detailing the products and services which could be agreed for an operational provision to the RCC-network.

Last bilateral discussions with potential contributors to the RCC were conducted in February/March 2024 with the main objectives:

- To understand and clarify the RCC-network functioning including the role of the different contributors.
- Identify products and services which could be proposed in an operational context (meaning perennial activity) based on existing capacities to start with.
- Identify the potential gaps in the RCC catalog of products and services.
- Gather all useful information to complete and consolidate the draft implementation, an essential document for setting up the RCC demonstration phase and then for its designation.

These discussions were conducted with 7 out of 9 countries from the SWIO region; namely Comoros, La Réunion, Madagascar, Mauritius, Seychelles, South Africa and Tanzania.

All the outcomes of the different workshop and discussions were considered in the elements which are presented in the next paragraphs.

3. The WMO SWIO RCC-Network

During the discussion at the scoping workshop, all the countries represented at the workshop expressed a clear indication of interest to contribute to the activities of a SWIO RCC. Given the number of potential participating countries and the expressed willingness to contribute, an RCC-Network seems to be the most appropriate. This SWIO RCC structure is, in principle, flexible and open and shall be based on the respective SWIO WMO Members' requirements.

3.1 The proposed structure

The RCC-network is composed of nodes. Each node is made as a consortium led by a lead institution.

The provisional structure for the SWIO-RCC network is directly proposed to fulfil the mandatory functions allowing the RCC-Network to develop its demonstration phase and then to be nominated as RCC-Network. Obviously, this structure is open and flexible and can evolve later on. Initially it is composed of 3 nodes plus a potential node on training and capacity building as follow (the lead institution is in bold, countries in italic are countries which have not confirmed yet their participation and the others are countries already offering to contribute):

- **Node on Long Range Forecasting (see Annex 2)**

La Réunion (lead), Comoros, Madagascar, Mauritius, Seychelles, South Africa, Tanzania*, Malawi, Mozambique*

- **Node on Climate Monitoring (see Annex 3)**
  Mauritius and/or South Africa and/or Seychelles (co-leads?), Comoros, Madagascar, Tanzania, La Réunion*, Malawi, Mozambique*
- **Node on Data Services (see Annex 4)**
  South Africa and/or Mauritius and/or Seychelles (co-leads?), Comoros, Madagascar, Tanzania, La Réunion*, Malawi, Mozambique*
- **Potential Node on training and Capacity Building**
  TBC (dedicated node *vs* incorporated in other nodes) Comoros, La Réunion, Madagascar, Mauritius, Seychelles, South Africa, Tanzania*, Malawi, Mozambique*.
  For starting the demonstration phase, it is proposed to incorporate this function in the other nodes. So, responsibility for the training function will be distributed between the different nodes and communicated with the 3 WMO Regional Training Centres in RA I relevant to the SWIO region (RTCs Kenya, Madagascar and South Africa) for coordination and planning.

3.2 The RCC Coordination

The Management committee (RCC MC)

A management committee is expected to coordinate all the aspects related to the RCC-network. To start with, it is composed of the Node Leads, IOC and is chaired by the RCC coordinator. It is expected that this committee will meet at least once a year virtually and/or for instance sizing the opportunities of other meetings such as the SWIOCOF.

The RCC MC ensures the RCC overall coordination. Thanks to discussions during the scoping meeting and the bilateral discussions, it is proposed that the chair of the management committee could be done by the Node-Leads and IOC, with a rotation possibly each 2 years.

The management committee should discuss and agree about the decision rules of the MC (e.g. acceptance of a new member, development of new services or products, etc).

3.3 The Demonstration phase

The demonstration phase could start after the formal commitments expressed by the PRs of the contributing countries. Ideally this demonstration phase should start as early as possible in 2025 for a minimum duration of 2 years. The demonstration phase will end when each contributor will be ready to provide on an operational base all the products and services described in the final version of the Implementation Plan.
It is important to note that during the demonstration phase the IP is still open and flexible. Indeed, at this stage, the IP has been prepared focusing on a minimal base function (Mandatory functions) enabling the RCC to be designated at the end of the demonstration phase.

Some new members can be included to contribute, or new products and services can be added to the IP such as high-resolution products. Also, some expected additional nodes such as the Climate Change node could be included to the RCC current structure. All these changes are possible if the members could demonstrate, through the demonstration phase, that they are capable to fulfil the functions operationally on perennial scale.

As during the demonstration phase adjustments can happen, the role of the RCC MC is crucial in the follow-up and possible modifications to be proposed. As a consequence, the RCC MC may be required to meet at a higher frequency than only once a year.

3.4 Interface with RCC users

The main users of RCC products are the NMHSs. Representatives from NMHSs across South-West Indian Ocean including neighbouring countries of the continental Africa attend the yearly SWIOCOF discussions. This provides an established forum whereby feedback on RCC products can become a regular process. In addition, regional meetings can be held in the early stages of the RCC for NMHSs to specifically discuss the initial RCC products and how they can develop.

To be noted that a regional web platform developed under the auspice of the IOC is used for the SWIOCOF and also the dissemination of the results of the BRIO project. Consequently, it is an excellent base to develop the needed RCC-network web site.

3.5 Interface with Global and Regional centres

Given that the existing WMO RCCs and regional centres with overlapping domains, including SADC CSC, RCC IGAD, ACMAD, already disseminate climate products, it is important to ensure coordination with these centres to avoid duplication and inconsistency among the delivered products, and to leverage knowledge and products across regional boundaries. This may bring an additional responsibility to the SWIO RCC-Network that must produce and deliver products that complement the existing products.

In this respect, the domain of responsibility of the SWIO RCC-Network needs to be clearly defined as many existing regional centres already cover overlapping areas and several potential contributing NMHS are already participating to some of these RCCs. This domain of responsibility will be presented in the final version of the implementation plan after discussions with neighbouring RCCs.

As a matter of evidence, a clear regional coordination mechanism should be established between the relevant RCCs in order to harmonize their activities, methods and ensure homogeneity in the regional datasets. Everybody should benefit from this regional synergy in term of methods, tools, products and practises.

Regarding the global level, there is a GPC-LRF in South Africa and, thanks to the SWIOCOF, a lot of efforts have been made to access to several GPC-LRF using Copernicus facilities. In addition, relevant large-scale data such as reanalysis are also provided. All these data are updated on a monthly base and made accessible via the SWIOCOF web platform. At this stage 3 GPC-LRF are used by the SWIOCOF (namely ECMWF SEAS5, Météo-France S8, NCEP CFSv2) but South Africa should add its model to the already existing models during the demonstration phase.

Obviously the WMO Lead Centre for Long Range Forecast Multi-Model Ensemble (WMO LC-LRFMME) is also a valuable source of forecast outputs from other GPCs and could be used when necessary.

Mechanisms should be established to feedback to the GPCs the experience of the RCC-Network in using their long-range forecasting and climate monitoring products.

3.6 Interface between the Nodes

The nodes of the RCC should work in close collaboration, and transparently, serving common standards, taking advantage from each other, implementing the RCC network functions being WIS compliant, etc. The regional products should be harmonized and consistent within each of the nodes and services expected in the other nodes. Consequently, the role of the MC will be crucial in this respect.

4. Detailed description of the different functions and services

The tables in the following Annexes to the IP provide a detailed description of the products to be produced and operationally provided by each of the RCC-Nodes. For each Node, the tables also provide the Lead institution, the Consortium institutions, and contacts details of those responsible for the delivery of products.

5. Conclusion

The implementation of this plan will begin to fulfil many of the regional requirements that have been identified through the on-going SWIOCOF sessions, the scoping meeting and various discussions dedicated to the SWIO RCC Network. As a matter of evidence, it is serves the basis for a close collaboration within the SWIO region and beyond referring to the other existing RCCs in Africa.

the SWIORCC-Network will start the demonstration phase with 6 contributors specified in the section 3.1, but it is envisioned that the members offering the input to the RCC will increase over the time, based on the expected developments of capacities of the Members.

The structure of the SWIO RCC-Network will likely be modified during and/or after the demonstration phase. Indeed, during the different discussions related to the structure it appeared that for instance a node dedicated to climate change would be very useful for the region and could help to value the efforts done along the BRIO project. Also climate products for the marine sector and particularly for fisheries have been identified. These and few other functions could be added during the demonstration phase.

So, the SWIO RCC-Network will start operating in this composition with a precise target which is to demonstrate the capacities of contributing countries to sustain operationally the provision of mandatory products and services to the benefit of the region. And obviously with the expected increase of capacities and capabilities thanks to the existing on-going projects such as ClimSA and Hydromet, the range of products and services should increase in time allowing all the NMHSs of the SWIO region to benefit from RCC products to better meet their users needs and requirements.

Annex 1: **Service provision Overview**

Table 1 – Mandatory Functions

Operational Activities for Long Range Forecasts (LRF)		
(M1) Interpret and assess relevant LRF products from Global Producing Centres (GPCs), distribute relevant information to RCC Users; and provide feedback to GPCs	- Assessment of CGM scores over the region for given seasons / parameters - Access to relevant GPCs' products - Access to GPCs' hindcasts when necessary - *feedback mechanism to be prepared during the demonstration phase*	- Dissemination through web portal
(M2) Generate regional and sub-regional tailored products, relevant to RCC User needs, including seasonal outlooks etc.	- Assessment of climate drivers current status and forecast (NINO3.4, IOD, SIOD) - Production of regional multi-model objective forecasts for rainfall and temperature - Assessment of regional forecasts scores (quality indices) - Production of regional forecast for cyclonic activity - Assist with the generation/interpretation of Climate outlooks	- Dissemination through web portal and dedicated COF
(M3) Generate consensus statement on regional or sub-regional forecasts	- Consensus statement issued for the start of the rainy season during the SWIOCOF - Provision of data and expertise during consensus generations / statements / thresholds at national or sub-regional level	
(M4) Perform verification of RCC quantitative LRF products, including the exchange of basic forecasts and hindcast data	- Verification of GCM forecasts for the parameters used in the LRF process - Verification of regional forecasts for rainfall and temperature - Verification of climate drivers forecasts	
(M5) Provide on-line access to RCC products/services to RCC Users	- Monthly update of the web portal (products and dataset) - Uploading products on websites and sharing with users	
(M6) Assess use of RCC products and services through feedback from RCC Users	- Collect feedback from identified RCC users on a yearly basis and draw action plan accordingly - Generation of online questionnaire to get feedback from users	
Operational Activities for Climate Monitoring		
(M1) Perform climate diagnostics including analysis of climate variability and extremes, at regional and sub-regional scales	- Generation of several climate products to support regional climate diagnostics - Climate diagnosis and analysis of extremes - Provision of monthly climate bulletins, annual report on the status of the	

	SWIO climate - Computing and providing regional climate indices	
(M2) Establish an historical reference climatology for the region and/or sub-regions	- Provision of quarterly datasets for: * Reanalysis ERA5 (large scale data res:2.5° - regional scale data res:1°) * Rainfall estimates GPCP (res: 2.5°) * Regional dataset over the SWIO region for rainfall and temperature (based on ERA5 reanalysis and SWIO zones) - Investigate historical climate data - Computing the regional and sub-regional normals	Provision of other estimated fields is considered for future: GPMIMERG / OISST / NDVI - Planned development of Regional dataset based on observed data from NMHSs (see data node)
(M3) Implement a Regional Climate Watch	- Provision of data/maps used for the LRF verification - targeting at least drought but also if possible, Heat Waves and Intense Precipitations	To be noted the usefulness of the monthly forecast (see HR functions)
Operational Data Services, to support operational LRF and climate monitoring		
(M1) Develop quality controlled regional climate datasets, gridded where applicable	- Provision of quality controlled daily observation data (for 7 countries out of 9) - Provision of quality controlled daily data for SWIO zones - Regional integration of above national observation dataset (stations and/or zones) - Monthly update of seasonal (JFM, …) rainfall and temperature data over SWIO zones (ERA5 and GPCC)	
(M2) Provide climate database and archiving services, at the request of NMHSs	- Provision of formatted and archived CGM forecasts and hindcasts for regional/national use	
Training in the use of operational RCC products and services		
(M1) Provide information on methodologies and product specifications for mandatory RCC products, and provide guidance on their use	- Documentation about methodology for seasonal forecasting and climate analysis - Assist with the generation of information on methodologies and product specifications	
(M2) Coordinate training for RCC Users in interpretation and use of mandatory RCC products	- Scientific animation of training session with dedicated material - Assist with the capacity building / training at the national level - Assist with the interpretation and use of mandatory RCC products	

Table 2 Highly Recommended Functions

Climate Prediction		
(H1) Provision of Monthly forecasts at regional scale / Access and use of ECMWF ensemble forecasts / Production of indices relevant for severe weather forecast	- Monthly forecasts provided by Météo-France La Reunion - Assist with the provision of associated products	To be implemented during the demonstration phase
Climate Monitoring		
Data Services		
(H1) Maintenance and development of the SEAFORDS tool for seasonal forecast downscaling and climate analysis	- Provided by Météo-France La Reunion	
(H2) Provide expertise on interpolation and downscaling technics	- Provided by Météo-France La Reunion	
Training		
(H1) Contribution to capacity building for NMHSs	*To be discussed during the demonstration phase*	
R&D		
(H1) – Improvement of forecasts downscaling methods including consensus practices leading to objective and reproducible outlooks		

Annex 2: **LRF**

The RA I SWIO RCC Node on Long-range Forecasting: Services and providers

1. Leading institution

Leading institution	Focal Point
Météo-France	Laurent LABBE Direction InterRégionale pour l'Océan Indien Division Etudes et Climatologie 50 bd du chaudron – BP4 97491 Ste Clotilde Cedex – La Réunion Email: laurent.labbe@meteo.fr Tel : +262 262921157

2. Consortium members

Consortium members	Focal Point
Comoros	Director Ahmed Youssouf Abdou Agence Nationle de l'Aviation Civile et de la Météorologie Tel: +269 3333 697 Email: ayoussouf3@gmail.com
Madagascar	Director Direction Générale de la Météorologie de Madagascar Nirivololona Raholijao BP 1254 Ampandrianomby Rue Farafaty, DGM - 101 Antananarivo, Madagascar Tel.: +261 32 67 730 12 Email: niriraholijao@gmail.com
Mauritius	Director Prithiviraj (Raj) Booneeady Mauritius Meteorological Services St Paul Road, Vacoas Mauritius Tel : +230 6861031 Email: meteo@intnet.mu, pbooneeady@gmail.com
Mozambique	
Seychelles	Chief Executive Officer Vincent Amelie Seychelles Meteorological Authority Seychelles International Airport P.O. Box 1604, Mahe, Seycheles Tel : +248 2722 957 Email : v.amelie@meteo.sc
South Africa	Dr Dawn Mahlobo South Africa Weather Service No. 1263 Heuwel Road, Centurion Central (ABSA Building) Pretoria South Africa Tel: +27 12 367 6176 Email: dawn.mahlobo@weathersa.co.za

Tanzania Meteorological Authority	Director General, Tanzania Meteorological Authority, University of Dodoma, Administration block, College of Informatics and Virtual Education, 1 CIVE Street, P.O. Box 27, 41218 Dodoma; Tel: + 255 26 2962610: Fax: +255 26 2962610 Email; met@meteo.go.tz; Website: www.meteo.go.tz

3. Date of start of pre-operational RCC service provision

Météo-France	

Attachments:

Attachment 1: Service provision overview

Attachment 2: Short product/service description

Attachment 3: Short description of interfaces to other RCC Nodes

Attachment 1: Service provision overview – technical details

RCC Function/ Activity/ Criteria*	Dataset/Product/Service	Producer	Areal coverage	Time of issuance	Means of service provision	Remarks
LRF						
M1	GCM scores - seasons / parameters	MF	SWIO Region	Constant	Web portal	
M1	GCM Scores -seasons / parameters	SAWS	SADC/SWIO region?	Constant	Web portal	Area to be confirmed
M2a	Monthly update of GCM forecasts (Lead-time 1,2 and 3)	MF, SAWS	Global	14th of the month	Web portal	Needs of coordination
M2b	GCM hindcasts	MF, SAWS	Global	When necessary		
M2b	LRF MME for zonal rainfall and temperature	MF	SWIO zones	15th of the month		
M2c	LRF MME scores for zonal rainfall and temperature	MF	SWIO zones	15th of the month		
M2d	Tropical Cyclone activity forecast	MF (RSMC)	RSMC region	October/January		Mini fora scheduled + SWIOCOF
M3a	Consensus seasonal outlook	SWIOCOF workgroup	SWIO zones	September	SWIOCOF session	
M3a	Consensus seasonal outlook	SARCOF workgroup	SARCOF region	?	SARCOF session	
M3b	Assistance in the generation / interpretation of seasonal outlooks	SWIOCOF workgroup	SWIO region	September	?	
M4a	Verification of GCM forecasts	MF, SAWS	SWIO region *and others?*	13th of the month ?	Web portal ?	
M4b	Verification of SWIO zones forecasts	MF	SWIO zones	13th of the month		
M4c	Verification of Climate Drivers forecasts	MF	Climate Indexes	13th of the month		
M5	Assess use of RCC products and	?	SWIO region	?	On-line	To be discussed

	services				questionnaire ? SWIOCOF session?	during the demonstration phase
M6	Assessment of the use of RCC products by users	SWIOCOF workgroup	SWIO region	September	SWIOCOF session	
	Information and guidance on methodologies and product specification for mandatory RCC functions and provide guidance on their use	TMA, Seychelles, MF	SWIO Region		Web portal?	Seasonal forecast and climate analysis by MF

Attachment 2: Short description of products/services (methodology, spatial/temporal resolution, quality indicators, validation)

Météo-France:

Product/Service	Methodology, spatial/temporal resolution, quality indicators, validation etc.
GPC current forecasts over the SWIO region	- Maps of mean anomalies for various parameters: U200, U500, U850, V850, MSLP, TCWV, SST, Rainfall, T2m - Quarterly values for lead-time 1,2,3 from the base month - Production by SEAFORDS software (© Meteo France)
GPC current forecast verification over the SWIO region	- Maps of RPSS score for a given lead-time / base month and for each parameter - Comparison between GPC forecast ensemble and ERA5 reanalysis - Production by SEAFORDS software (© Meteo France)
GPC forecast scores over the SWIO region	- Maps of correlation index for a given lead-time and for each parameter - Maps of ROC area index for a given lead-time and for each parameter - Comparison between GPC hindcast ensemble and ERA5 reanalysis - Production by SEAFORDS software (© Meteo France)
Current regional forecast over the SWIO region	- Maps of seasonal forecast of rainfall and temperature for each zone of the region expressed as tercile probabilities for lead-time 1,2,3 from base month - Maps of confidence index for each zone - Statistical adaptation of multi-GCM ensemble forecast over the SWIO zones - Production by SEAFORDS software (© Meteo France)
Regional forecast verification over the SWIO region	- Maps of RPSS score for a given lead-time / base month, for each parameter and - Comparison between the regional forecast and the reference dataset over the SWIO zones. - Production by SEAFORDS software (© Meteo France)
Climate Drivers observation, forecast and verification – Niño3.4, IOD and SIOD	- Charts of each climate index displaying observed and forecast values for the lead-times 1,2,3 from base month - Production by SEAFORDS software (© Meteo France)
ERA5 verification maps	- Maps for each parameter over SWIO region - Quarterly anomalies - Monthly update - Production by SEAFORDS software (© Meteo France)
SWIO zones verification maps/charts	- Maps for rainfall and temperature over SWIO zones - Charts showing rainfall and temperature recent evolution (2 years) for each SWIO zone - Quarterly anomalies - Monthly update

	- Production by SEAFORDS software (© Meteo France)

Attachment 3: Short description of (expected) interfaces to other RCC Nodes (to be specified later)

Météo-France:
Coordination between Data Services, Climate monitoring and LRF nodes through the management committee

Note: Implementation of an annual(?) meeting of RA I SWIO RCC node coordinators to discuss issues of service delivery and of collaboration [resp.: RA 1 SWIO RCC Network Coordinator].

Annex 3: **Monitoring**

The RA I SWIO RCC Node on Monitoring: Services and providers

1. Leading institution

Leading institution	Focal Point
Mauritius and/or SAWS and/or Seychelles (tbd)	

2. Consortium members

Consortium members	Focal Point
Comoros	Director Ahmed Youssouf Abdou Agence Nationle de l'Aviation Civile et de la Météorologie Tel: +269 3333 697 Email: ayoussouf3@gmail.com
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Mauritius	Director Prithiviraj (Raj) Booneeady Mauritius Meteorological Services St Paul Road, Vacoas Mauritius Tel : +230 6861031 Email: meteo@intnet.mu, pbooneeady@gmail.com
Météo-France	Laurent LABBE Direction InterRégionale pour l'Océan Indien Division Etudes et Climatologie 50 bd du chaudron – BP4 97491 Ste Clotilde Cedex – La Réunion Email: laurent.labbe@meteo.fr Tel : +262 262921157
Mozambique	
Seychelles	Chief Executive Officer Vincent Amelie Seychelles Meteorological Authority Seychelles International Airport P.O. Box 1604, Mahe, Seycheles Tel : +248 2722 957 Email : v.amelie@meteo.sc
South Africa	Dr Dawn Mahlobo South Africa Weather Service No. 1263 Heuwel Road, Centurion Central

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Tanzania Meteorological Authority	Director General, Tanzania Meteorological Authority, University of Dodoma, Administration block, College of Informatics and Virtual Education, 1 CIVE Street, P.O. Box 27, 41218 Dodoma; Tel: + 255 26 2962610: Fax: +255 26 2962610 Email; met@meteo.go.tz; Website: www.meteo.go.tz

3. Date of start of pre-operational RCC service provision

Attachments:

Attachment 1: Service provision overview

Attachment 2: Short description of product/service

Attachment 3: Short description of interfaces to other RCC Nodes

Attachment 1: Service provision overview – technical details

RCC Function/ Activity/ Criteria*	Dataset/Product/Service	Producer	Areal coverage	Time of issuance	Means of service provision	Remarks
Monitoring						
M1	Monthly climate diagnosis bulletin for temperature and precipitation	Node-Lead	SWIO region	?	?	Should be based on data service function
M2	Climatology standard normals (1991-2020) for historical reference climatology (at monthly scale minimum)	Node-Lead	SWIO region		?	To be integrated into a regional climatology
M3	Implement a regional climate watch	SAWS? Mauritius?	SWIO region	When necessary		SAWS already offers for coastal countries. The target could be Drought, Heat waves and Intense precipitations
	Information and guidance on methodologies and product specification for mandatory RCC functions and provide guidance on their use	TMA, Seychelles, MF	SWIO Region		Web portal?	

Attachment 2: Short description of product/service (methodology, spatial/temporal resolution, quality indicators, validation)

Météo-France:

Product/Service	Methodology, spatial/temporal resolution, quality indicators, validation etc.
GPC current forecasts over the SWIO region	- Maps of mean anomalies for various parameters: U200, U500, U850, V850, MSLP, TCWV, SST, Rainfall, T2m - Quarterly values for lead-time 1,2,3 from the base month - Production by SEAFORDS software (© Meteo France)
GPC current forecast verification over the SWIO region	- Maps of RPSS score for a given lead-time / base month and for each parameter - Comparison between GPC forecast ensemble and ERA5 reanalysis - Production by SEAFORDS software (© Meteo France)
GPC forecast scores over the SWIO region	- Maps of correlation index for a given lead-time and for each parameter - Maps of ROC area index for a given lead-time and for each parameter - Comparison between GPC hindcast ensemble and ERA5 reanalysis - Production by SEAFORDS software (© Meteo France)
Current regional forecast over the SWIO region	- Maps of seasonal forecast of rainfall and temperature for each zone of the region expressed as tercile probabilities for lead-time 1,2,3 from base month - Maps of confidence index for each zone - Statistical adaptation of multi-GCM ensemble forecast over the SWIO zones - Production by SEAFORDS software (© Meteo France)
Regional forecast verification over the SWIO region	- Maps of RPSS score for a given lead-time / base month, for each parameter and - Comparison between the regional forecast and the reference dataset over the SWIO zones. - Production by SEAFORDS software (© Meteo France)
Climate Drivers observation, forecast and verification – Niño3.4, IOD and SIOD	- Charts of each climate index displaying observed and forecast values for the lead-times 1,2,3 from base month - Production by SEAFORDS software (© Meteo France)
ERA5 verification maps	- Maps for each parameter over SWIO region - Quarterly anomalies - Monthly update - Production by SEAFORDS software (© Meteo France)
SWIO zones verification maps/charts	- Maps for rainfall and temperature over SWIO zones - Charts showing rainfall and temperature recent evolution (2 years) for each SWIO zone - Quarterly anomalies - Monthly update - Production by SEAFORDS software (© Meteo France)

Attachment 3: Short description of (expected) interfaces to other RCC Nodes (to be specified later)

Météo-France:
Coordination between Climate monitoring and LRF nodes through the management committee

Note: Implementation of an annual(?) meeting of RA I SWIO RCC node coordinators to discuss issues of service delivery and of collaboration [resp.: RA 1 SWIO RCC Network Coordinator].

Annex 4: **Data**

The RA I SWIO RCC Node on Data Services: Services and providers

1. Leading institution

Leading institution	Focal Point
SAWS and/or Mauritius and/or Seychelles (tbd)	

2. Consortium members

Consortium members	Focal Point
Comoros	Director Ahmed Youssouf Abdou Agence Nationle de l'Aviation Civile et de la Météorologie Tel: +269 3333 697 Email: ayoussouf3@gmail.com
Madagascar	Director Direction Générale de la Météorologie de Madagascar Nirivololona Raholijao BP 1254 Ampandrianomby Rue Farafaty, DGM - 101 Antananarivo, Madagascar Tel.: +261 32 67 730 12 Email: niriraholijao@gmail.com
Mauritius	Director Prithiviraj (Raj) Booneeady Mauritius Meteorological Services St Paul Road, Vacoas Mauritius Tel : +230 6861031 Email: meteo@intnet.mu, pbooneeady@gmail.com
Météo-France	Laurent LABBE Direction InterRégionale pour l'Océan Indien Division Etudes et Climatologie 50 bd du chaudron – BP4 97491 Ste Clotilde Cedex – La Réunion Email: laurent.labbe@meteo.fr Tel : +262 262921157
Mozambique	
Seychelles	Chief Executive Officer Vincent Amelie Seychelles Meteorological Authority Seychelles International Airport P.O. Box 1604, Mahe, Seycheles Tel : +248 2722 957 Email : v.amelie@meteo.sc
South Africa	Dr Dawn Mahlobo South Africa Weather Service No. 1263 Heuwel Road, Centurion Central

	(ABSA Building) Pretoria South Africa Tel: +27 12 367 6176 Email: dawn.mahlobo@weathersa.co.za
Tanzania Meteorological Authority	Director General, Tanzania Meteorological Authority, University of Dodoma, Administration block, College of Informatics and Virtual Education, 1 CIVE Street, P.O. Box 27, 41218 Dodoma; Tel: + 255 26 2962610: Fax: +255 26 2962610 Email; met@meteo.go.tz; Website: www.meteo.go.tz

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Attachment 1: Service provision overview – technical details

RCC Function/ Activity/ Criteria*	Dataset/Product/Service	Producer	Areal coverage	Time of issuance	Means of service provision	Remarks
Data Services						
M1	Monthly update of observation quality controled daily observation data	MF	La Reunion and Mayotte	Tbd	FTP access	Also provided as agregated data over SWIOCOF zones
M1	Provision of quality controlled daily observation data	SAWS	South Africa	tbd	?	Could also provide agregated data over SWIOCOF zones
M1	Provision of quality controlled daily observation data	Seychelles	Seychelles	tbd	?	Could also provide agregated data over SWIOCOF zones
M1	Provision of quality controlled daily observation data	Mauritus	Mauritus			Could also provide agregated data over SWIOCOF zones
M1	Provision of quality controlled daily observation data	Madagascar	Madagascar			Could also provide agregated data over SWIOCOF zones
M1	Provision of quality controlled daily observation data	Comoros	Comoros			Could also provide agregated data

						over SWIOCOF zones
		Mozambic	Mozambic			
		Malawi	Malawi			
		Tanzania	Tanzania			
M1	Regional integration of above national observation dataset (stations and/or zones)	Node-Lead!	SWIO region	?	?	
M1	Monthly update of seasonal (JFM, …) ERA5 dataset for the SWIO region	MF	Global / SWIO Region	11th of the month	Web portal	*Proxy of observation data*
M1	Monthly update of seasonal (JFM, …) GPCP rainfall estimates for the SWIO region	MF	SWIO region	11th of the month		*Proxy of observation data*
M1	Monthly update of seasonal (JFM, …) rainfall and temperature data over SWIO zones (ERA5 and GPCC)	MF	SWIO zones	11th of the month		*Proxy of observation data*
	Information and guidance on methodologies and product specification for mandatory RCC functions and provide guidance on their use	TMA, Seychelles, MF	SWIO Region		Web portal, other?	

Attachment 2: Short description of products/services (methodology, spatial/temporal resolution, quality indicators, validation)

Météo-France:

Product/Service	**Methodology, spatial/temporal resolution, quality indicators, validation etc.**
ERA 5 reanalysis – ECMWF provided by Copernicus/C3S	**Methodology :** - Gridded Large scale parameters (Res: 2.5°): U200, U500, U850, V850, MSLP, TCWV, SST, Rainfall, T2m - Gridded Regional scale parameters (Res 1°): rainfall and T2m over SWIO region - Quarterly data (averages/accumulation) - Archive: 1979 – present (monthly update) - Reference: https://confluence.ecmwf.int/display/CKB/ERA5%3A+data+documentation
GPC forecasts – ECMWF, MF, NOAA from Copernicus/C3S	- Gridded Large scale parameters (Res: 2.5°): U200, U500, U850, V850, MSLP, SST, Rainfall, T2m - Quarterly forecasts (averages/accumulation): lead-time 1,2,3 from current month - References: https://climate.copernicus.eu/seasonalforecasts
GPC hindcasts – ECMWF, MF, NOAA from Copernicus/C3S	- Gridded Large scale parameters (Res: 2.5°): U200, U500, U850, V850, MSLP, SST, Rainfall, T2m - Quarterly reforecasts (averages/accumulation): lead-time 1,2,3 from base month - Period: 1993-2016 - References: as above
French Observation dataset: La Reunion and Mayotte	- Rainfall and temperature relevant for the two islands - Quarterly data - Period: 1979 – present (monthly update) - References: https://meteofrance.fr/missions/observer-etprevoir/le-role-de-lobservation

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Note: Implementation of an annual meeting of RA I SWIO RCC node coordinators to discuss issues of service delivery and of collaboration [resp.: RA 1 SWIO RCC Network Coordinator].