RCOF Review 2017

SWIOCOF

Status Report (Survey)

Annotated Outline

Specific Climate features of concerned region

The South West Indian Ocean (SWIO) region refers to the Indian Ocean islands states and coastal African countries located south of the equator. The area has an essentially tropical climate with two distinct main seasons: a dry season, which lasts from June to November, and a rainy season, which lasts from November to May. The period from November to April is marked by tropical cyclone activity with disturbances leading to significant damage.

The major sources of seasonal climate variability and predictability in the region are the sea Surface Temperatures (SSTs) of the equatorial Pacific, a region influenced by the El Niño Southern Oscillation (ENSO), as well as, the Indian Ocean Dipole (IOD) and the Subtropical Indian Ocean Dipole (SIOD) modes. Other modes such as the North Atlantic Oscillation (NAO), the Quasi Biennial Oscillation (QBO) and the Southern Annular Mode (SAM) may contribute, to a lesser extent, to seasonal climate variability.

The South West Indian Ocean is seriously prone to natural disasters like tropical cyclones. Intense storms and gale force winds provoke heavy precipitation and floods, which are responsible for road and infrastructure damage and loss of life.

These climate phenomena are often accompanied by a heightening of risk factors for climate-related diseases, as was witnessed in La Reunion in 2006, which was afflicted by the Chikungunya epidemic.

Biodiversity is also threatened by the climate of the region. Indeed, the strong El Niño of 1997 to 1998 provoked an unprecedented death of corals, affecting 50 to 90% of corals in the Indian Ocean. This impact of coral bleaching and mortality is significant since many people depend on reefs for food, shoreline protection and tourism income in the South West Indian region.

Water resource is a main issue in the region due to severe drought events, possibly leading population to hunger in parts of the region (Madagascar). Due to their small size, islands states water policies are particularly vulnerable to rainfall variability and drought events.

Another issue is clearly linked to maritime activity (fishing industry) closely linked to SST and currents variability.

The RCOF background

SWIOCOF is still a young process among all Regional Outlook Forums (less than 10 years). This forum includes five Idian Ocean Commission (IOC) members (Comoros, Reunion (France), Madagascar, Mauritius, Seychelles) plus coastal countries of the South-West Indian Ocean: Tanzania, Mozambique, South Africa.

Due to geographical and climactic similarities, these countries share a number of concerns and issues in terms of vulnerability to climate variability and climate change. Understanding regional and local climate including teleconnections with large-scale variability, assessing predictability and facilitating tailoring and application of climate information are among the challenges facing the region.

The interest and feasibility of such a forum was a regular topic for discussion in the regional workshops organized within ACCLIMATE project (2008-2012) on the adaptation of IOC countries to climate change: www.acclimate-oi.net.

The workshop held in Saint-Denis de La Réunion at Météo-France (27-30 September 2011) in the framework of ACCLIMATE project led to the organization of a first South-West Indian Ocean Climate Outlook Forum (SWIOCOF) in September 2012. In the absence of sustained financial support and clear governance, SWIOCOFs could not be regularly organized, although it was unanimously agreed that SWIOCOF was of great benefit to the South-West Indian Ocean countries/territories.

In parallel, in June 2012, the African Center of Meteorological Application for Development (ACMAD) held in Moroni, Comoros, a "scoping workshop on seasonal forecasting of cyclone activity in the South-West Indian Ocean region, for climate risk management and adaptation to climate change for sustainable development". This workshop was followed by two RCOFs in October 2013 and January 2016. In addition, two longstanding RCOFs, namely the Southern African Climate Outlook Forum (SARCOF) and the Greater Horn of Africa Climate Outlook Forum (GHACOF) also extend their scope to conditions in the adjoining Indian Ocean, though their main focus is on the continental climate. However, participants representing the South-West Indian Ocean countries/territories in these forums have indicated that, due to the geographic and climatic specificities of the South-West Indian Ocean region, the applicability of forums targeted at the broader sub-regions is limited.

During the Regional Consultation on Climate Services in the Indian Ocean from 14 to 16 March 2016 in Ebene (Mauritius) under the auspices of the Global Framework for Climate Services (GFCS), noting the initiatives of ACMAD and Météo-France, the World Meteorological Organization (WMO) stressed the need to strengthen the RCOF process within the South-West Indian Ocean sub-region in order to meet the expectations and specificities of island states/territories situated therein.

Finally, a 5th edition of the SWIOCOF was held in September 2016 in Seychelles thanks to the financial support of the Government of Canada through the Federal Department of the Environment through the *Programme for Implementing GFCS at Regional and National Scales*. Logistical aspects of SWIOCOF-5 were coordinated by IOC, and technical aspects by Météo-France in Reunion and ACMAD.

The targeted frequency is once a year in September. Targeted period is October through January corresponding to the end of the dry season during which the onset of the rainy season occurs. This time of year is critical for the water sector being in the middle of the dry season with a strong vulnerability to the timing of the onset. Moreover, September offers the opportunity to provide an initial assessment of the expected cyclone activity over the South-West Indian Ocean basin for the next rainy season

The RCOF process

Objectives

The main objectives of SWIOCOF are:

- reviewing available knowledge and understanding of regional climate variability;
- enhancing exchanges, networks and partnerships on Regional Climate Outlook for the region;
- enhancing core scientific and technical capabilities for RCOF in the region ;
- facilitating access to the essential inputs on large-scale and regional-scale drivers and jointly interpreting their potential influences on the climate over the South-West Indian Ocean sub-region;
- improving seasonal forecast over the sub-region and promoting the usefulness of consensus-based seasonal forecasts in decision making processes within climate-sensitive socio-economic sectors.

Programme

To best meet the objectives, SWIOCOF includes a 3 days "pre-forum training and scientific workshop" followed by a 2 days "Forum" proper involving media, policy and decision makers.

The Pre-Forum (3 days)

- Focus on two main issues facing the South-West Indian Ocean region:
    - Water resources: this issue is a common concern of all countries in the region. Seasonal forecast of precipitation can be of great interest for management of water resources (restrictions on the use of water, hydroelectric power, irrigation, etc.);
    - Cyclone activity of the up-coming season: This is also an issue shared by all the countries of the region, and knowledge of cyclonic activity is essential in order that disaster risk management services develop preparedness for the coming cyclonic season.
- Include a significant training component for the developing country participants including the use of statistical downscaling methods that is especially critical for seasonal rainfall predictions on small islands.
- Produce a consensus statement on seasonal climate outlook including:
    - assessment of current regional climate conditions and related water resources;
    - precipitation outlook for the next 3 months across sub-region (Oct-Nov-Dec 2016); and
    - cyclone activity outlook for the upcoming rainy season for the South-West Indian Ocean basin.

The Forum (2 days)

- Serves as the venue to communicate the seasonal consensus outlook developed at the pre-forum, and to validate the accuracy of analogous seasonal consensus statements issued by prior SWIOCOFs. The consensus statement developed at the Pre-forum will be communicated both to the general public, via press releases, and to practitioners – climate scientists as well as representatives of key climate-sensitive sectors.
- Facilitates exchanges between the providers of climate products and services, the NMHSs, and the users from climate-sensitive sectors, potentially interested in these services. The Forum provides the opportunity to strengthen the understanding of user expectations, and how to interpret and apply these outlooks, and also to raise sectoral needs and capacity gaps.

Participants

Climate scientists: one representative of each meteorological service of the countries of the area is invited (five IOC members + Mozambique, Tanzania and South Africa) to participate in both the Pre-Forum and Forum (18-22 September). In addition, the Pre-forum and Forum is attended by four or five international experts in seasonal forecasting, climate modeling and downscaling.

Sectoral representatives: The Forum is attended by representatives of priority climate-sensitive sectors in the South-West Indian Ocean region including sectors strongly impacted by

the water resources issues and by cyclone activity. One sectoral representative from each IOC member plus Tanzania, Mozambique, South Africa is invited to participate in SWIOCOF. Local media are also invited.

Technical inputs for the Pre-COF

Meteo-France and the African Centre for Meteorological Applications for Development (ACMAD) coordinate technical support to the forum. In particular, these Centers prepare large-scale climate data sets (ERA-interim, GPCP, GPCs and RCCs seasonal forecasts, RSMCs Cyclone data) for analysis, interpretation and downscaling activities prior to and during the pre-forum. These data are provided to all participants to the pre-forum.

Participants from countries provide local data sets quality checked when possible (precipitation from synoptic stations and local rain gauges, cyclone data archives).

The downscaling process relies on a statistical software (similar to CPT from IRI) developed at Meteo-France La Reunion under R language. The statistical tool is feeded by Météo-France and ECMWF global seasonal forecast models.

Capacity needs

Since the process is quite young, capacity needs of the major stakeholders and NMHSs in SWIO region are wide and heterogeneous. Generally speaking, major needs are:

- Enhance knowledge and understanding of regional climate variability
- Facilitate access to large scale climate data sets
- Build capacity in climate downscaling (especially for small island countries)
- Promote the usefulness of consensus-based seasonal forecast in decision making processes within climate sensitive socio-economic sectors.
- Identify main needs at regional scale in terms of climate services in support to key sectors
- Define and build corresponding climate services (relevant regional products).

These needs are addressed through the Pre-Forum and Forum process, Pre-Forum being dedicated to purely climate and scientific issues (build capacities of NMHSs), Forum session being dedicated to interactions between climate experts and potential users from various climate-sensitive sectors.

RIMES (Regional Integrated Multi-Hazard Early Warning System for Africa and Asia) participates to the forum and brings its experience within climate services provision.

User involvement

In 2015, most sectors were represented at the forum mainly through national representatives. Some countries hold national climate forums.

PIROI (regional red cross platform in Reunion Island) is clearly identified as a regional user. IOC (Indian Ocean Commission) is a potential regional user.

No user feedback at this stage, process being quite young.

SWOT analysis

From a technical point of view, SWIOCOF benefits from Meteo-France's presence in the region (through its implementation in Reunion Island as a cyclone RSMC): provision of regional, global data sets, downscaling tools and expertise crucial for small islands issues and cyclonic activity purpose.

SWIOCOF also benefits from ACMAD technical support. ACMAD's experience in RCOF processes in Africa is very valuable for the process.

One main weakness is the poor density of observed data. Quality of the data is also an important issue for the region.

Another important weakness comes from the absence of regional governance.

Sustainability of RCOF

At this stage, SWIOCOF is not financially sustained by any regional structure. 2016 and 2017's editions are mainly supported by WMO. There is a real need to find mechanism to sustain the process. One main recommendation from 2016's edition was to encourage IOC to make provision within their budget to annually support this regional climate forum.

For 2017's edition, Meteo-France in Reunion Island managed to secure fundings through regional cooperation funds allocated by Region Réunion.

CREWS initiative was also suggested as a possible way to sustain the process.

Way forward

The next session (sept. 2017) will be an opportunity to strengthen capacities from different NMHSs, strengthen links with national or regional stakeholders in order to identify key services that could be implemented for the region within the next months and years.

One main scientific issue would be to define a regional homogeneous data set of observed precipitation and temperature (ground observation or remote sensing information…). These data set could be shared through a regional web platform that could be enhanced with regional forecast data and regional climate monitoring products.

Onset of rainy season and sub-seasonal information seem to be important issues for main stakeholders of most socio-economic sectors.