



THE PROGRAMME FOR BUILDING REGIONAL CLIMATE CAPACITY IN THE CARIBBEAN (BRCCC PROGRAMME)

Second (2nd) Meeting of the Consortium of Regional Sectoral EWISACTs Coordination Partners

CIMH Headquarters, Husbands, St. James

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Meeting Report

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List of Acronyms

United States Agency for International Development	USAID
Building Regional Climate Capacity in the Caribbean	BRCCC
World Meteorological Organization	WMO
Regional Climate Centre	RCC
World Meteorological Organization	WMO
Caribbean Institute for Meteorology and Hydrology	CIMH
National Meteorological and Hydrological Services	NMHS
Early Warning Information Systems Across Climate Timescales	EWISACTs
Early Warning Systems	EWS
Comprehensive Disaster Management	CDM
Terms of Reference	TOR
Work and Implementation Plan	WIP
Centre for Renewable Energy and Energy Efficiency	CCREEE
Global Framework for Climate Services	GFCS
Caribbean Agricultural Research & Development Institute	CARDI
Caribbean Tourism Organization	CTO
Caribbean Hotel and Tourism Association	CHTA
Organization of Eastern Caribbean States	OECS
Caribbean Water and Wastewater Association	CWWA
Caribbean Climate outlook Forum	CariCOF
Disaster Risk Management	DRM
Early Warning Information Systems	EWIS
Caribbean Disaster Emergency Management Agency	CDEMA
Barbados Water Authority	BWA
Inter-American Institute for Cooperation on Agriculture	IICA
Caribbean Electric Utility Services Cooperation	CARILEC
Caribbean Community and Common Market	CARICOM
Centre for Resource Management and Environmental Studies	CERMES
Caribbean Public Health Agency	CARPHA
El Niño / Southern Oscillation	ENSO
National Ocean and Atmospheric Administration	NOAA
Caribbean Community Climate Change Center	CCCCC
Letter of Agreement	LoA

1 Introduction

1.1 The BRCCC Programme

The Caribbean region has been increasing its resilience to the impacts of weather and climate-related hazards for more than 40 years. To address these impacts going forward, the American People, through the USAID, are funding a new Programme to build regional capacity for adaptation to climate variability and change in the Eastern Caribbean, in partnership with the WMO and the CIMH. Under an agreement signed in January 2014, USAID will provide funding support over three years (2014-2017) to the WMO, which will work in partnership with CIMH, to amongst other things, support the establishment of a WMO designated Regional Climate Centre (RCC) for the Caribbean, housed at CIMH (WMO, USAID, & CIMH, 2014).

The funds being provided are to strengthen the CIMH to support its ability through:

1. Supporting institutional enhancements;
2. Increasing the range of products and services delivered to stakeholders;
3. Enhancing human and technical capacities at the CIMH and in NMHSs in the Caribbean; and
4. Improving service delivery mechanisms to national, regional and international stakeholders.

Since April 2013, CIMH has been in the demonstration phase of becoming the WMO RCC for the Caribbean. WMO RCCs are Centres of Excellence (CoE) that produce regional climate products and services including short-, medium- and long-range forecasts in support of regional and national climate information needs. The information produced and capacity developed by CIMH enables CMO Member States to deliver better climate services to national and regional users. It is expected that through the implementation of Programme Component I - Technical Area III, the BRCCC Programme will improve the range and use of climate-related products and services at the appropriate spatio-temporal scales to sectoral decision-makers.

This Technical Area has four (4) Outcome Areas as follows:

1. Established relationships between meteorologists/climatologists, scientists from other sectors and policymakers from across sectors;
2. Initiation of the development, deployment and platform integration of sector specific forecasting/planning models in the form of early warning systems;
3. Enhanced institutional capacity; and
4. Enhanced adaptive capacity.

1.2 Sectoral Early Warning Information Systems across Climate Timescales (EWISACTs)

Climate variability and change occur on timescales ranging from sub-seasonal to seasonal to decadal and beyond, making it necessary to develop effective Early Warning Information Systems across Climate Timescales (EWISACTs). An important component of the BRCCC Programme is the establishment of EWISACTs. Early Warning Systems (EWS) are recognized by the *Regional Comprehensive Disaster Management (CDM) Strategy and Programming Framework 2014-2024*² and the *Implementation Plan for the 'Regional Framework for Achieving Development Resilient to Climate Change'*³ as critical to the effective management of climate-related disasters and adaptation to climate variability and change. EWISACTs can improve the effectiveness and efficiency of sustainable planning, adaptation and mitigation strategies across major weather and climate-sensitive socio-economic sectors. If well aligned with priority sectors, sectoral EWISACTs can support regional growth resilient to climate risks.

1.3 The Consortium of Regional Sectoral EWISACTs Coordination Partners

A formalized sectoral mechanism in which regional sectoral partners are supported by CIMH to drive the development and implementation of sectoral EWISACTs, not only fosters sectoral ownership of this agenda, but also lays the foundation for the sustainability of sectoral EWISACTs long after the completion of the BRCCC Programme. The Consortium of Regional Sectoral EWISACTs Coordination Partners is therefore conceived to be a key mechanism to champion the design, development and delivery of tailored climate products and services in the agriculture and food security, disaster risk management, energy, health, tourism and water sectors⁴. The Consortium of Regional Sectoral EWISACTs Coordination Partners will work together in raising sectoral awareness about EWISACTs and formalizing an approach to the co-development of climate products and services. By providing an opportunity for representing sector issues, positions and recommendations related to weather and climate at the meetings of the Consortium of Regional Sectoral EWISACTs Coordination Partners, the Consortium is intended to facilitate the consultative and participatory processes necessary for successful EWISACTs development and implementation.

The Second (2nd) Meeting of the Consortium of Regional Sectoral EWISACTs Coordination Partners was held at the CIMH Headquarters, on October 21st to 22nd, 2015. This meeting provided an opportunity for cross-sectoral dialogue between the CIMH and lead regional

² Developed by the Caribbean Disaster Emergency Management Agency (CDEMA) in 2014.

³ Developed by the Caribbean Community Climate Change Centre (CCCCC) in 2011.

⁴ The Global Framework for Climate Services (GFCS) has five initial priority sectors: agriculture and food security, water, health and disaster risk reduction and energy. The tourism sector has been identified as an additional priority sector for the Caribbean region.

sectoral organizations. It also advanced prior discussions arising out of the First (1st) Meeting of the Consortium of Regional Sectoral EWISACTs Coordination Partners held on May 6-7, 2015.

The objectives of 2nd Consortium Meeting were:

1. To formalize the Consortium arrangement through the endorsement and adoption of a Consortium of Regional Sectoral EWISACTs Coordination Partners Terms of Reference (TOR);
2. To confirm sector partners through the endorsement and adoption of Sectoral EWISACTs Coordination Partners TORs;
3. To endorse and adopt a Conceptual Framework and Methodology for sectoral EWISACTs development in the Caribbean;
4. To endorse and adopt a Work and Implementation Plan (WIP) for sectoral EWISACTs development in the Caribbean;
5. To discuss regional and national perspectives on early warning and response to the potential impacts of El Niño 2015-2016;
6. To showcase new early warning information products; and
7. To report on progress to date on the development of sectoral EWISACTs

The meeting was carried out according to the meeting agenda (see Appendix A). The meeting proceedings included presentations and guided discussions over four (4) sessions.

A total of 30 participants attended the meeting over two days (see Appendix B). The Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE) joined the meeting virtually on October 22nd, 2015 for discussions on the energy sector Terms of Reference (TOR).

2 Welcome Remarks (Presented by Dr. David Farrell and Mr. Adrian Trotman, CIMH)

Mr. Adrian Trotman welcomed the participants and apologized for the rapid putting together of the meeting stating that there is a pressing need to tie up loose ends and move forward. He stated that weather affects everything under the sun and while the CIMH has the scientific expertise, they don't have experts in the individual sector-specific fields and as such, the Institute needs sectoral help.

Dr. David Farrell opened by giving a brief overview of the establishment of the Global Framework for Climate Services (GFCS). He started by stating that in 2007, CIMH started to deliver climate services through the formation of the Section of Applied Meteorology and Climatology, charged with delivering products useful for sectors, with some focus in those early

days on agriculture. Soon afterwards, and through another initiative that supported collaboration with the Caribbean Agricultural Research & Development Institute (CARDI), climate services for agriculture became even more prominent. With the establishment of the GFCS, there was discussion in four thematic priority areas namely: water, agriculture, health, and disaster and risk reduction. It was later recognized that energy was a climate sensitive sector that warranted greater attention, and as a result, was added to the list of priority areas. He mentioned as well that although tourism was not recognized at the global level as a priority of the GFCS, there was a positive response to it from the WMO.

He went on to talk about the lesson learned from the 2009 – 2010 drought. He urged that there should be a proactive approach as opposed to a reactive one as was evident in the 2009 – 2010 drought. He mentioned that there are a suite of drought products that are available that can aid sectors in taking the step towards a more proactive approach to drought management. He stated that partnerships across various sectors can create an integrative platform so that all the sectors can work together to formalize appropriate drought actions.

Touching on the 1st Meeting of the Consortium, Dr. Farrell noted that although the Terms of Reference (TORs) was not finalized at that meeting, there is hope to ink a Consortium agreement at this meeting so that real work can get done. He also expressed CIMH's desire for the Consortium to live beyond the end of the Building Regional Climate Capacity in the Caribbean (BRCCC) Programme period in January 2017. He further stated that CIMH is committed to making the benefits long-term.

Dr. Farrell stated that he is eager to see the showcase of early warning products as this demonstrates innovation. He ended by alluding to the Dominica experience where weather superimposed on climate and had a role to play in the disaster. He enforced the need for the use of early warning systems to enhance our vigilance, and communicate through them.

2.1 Introduction of participants/Icebreaker (Conducted by Mr. Adrian Trotman and Ms. Shelly-Ann Cox, CIMH)

Participants were asked by Mr. Adrian Trotman to briefly introduce themselves by stating their names and the organization they were representing. Following the introduction an icebreaker activity was conducted by Ms. Shelly-Ann Cox to allow participants to become a bit more familiar with each other and to interact in a more comfortable atmosphere. For the ice breaker activity, representatives were split into two groups and asked to explain what Consortium meant to them using the letters of the word Consortium. The groups came up with words such as:

- Collaboration
- Organization
- Networking
- Strategizing
- Outlook
- Resilience
- Teamwork
- Implementation
- Unity
- Monitoring



Figure 1: Participants presenting the icebreaker activity

3 Presentation of the Draft Report of the 1st Consortium Meeting (Presented by Mr. Adrian Trotman, CIMH)

Mr. Adrian Trotman presented the draft Report on the 1st Consortium Meeting by first recalling the meeting objectives, the participation scope and gave a synopsis of what occurred in each session. He urged representatives to pay special attention to where they left off at the first meeting and presented the progress made since the end of the meeting. He noted that CIMH reviewed and rationalized the Consortium and sectoral partner TORs as well as, the Work Implementation Plan (WIP) documents in collaboration with sectoral agencies. As far as was possible, the CIMH followed up with the CARICOM Secretariat regarding the refinement of the language used in the Consortium TOR. CIMH also investigated the Caribbean Catastrophe Risk Insurance Facility's (CCRIF's) support for an intern to act as a liaison across the CIMH, the Caribbean Tourism Organization (CTO) and the Caribbean Hotel and Tourism Association

(CHTA). Finally, the CIMH followed up with the Energy sector regarding representation on the Consortium.

The evaluation of the last meeting was also presented. Participants agreed that the main reason for attending the meeting was to participate in the Consortium and to gain a better understanding of Caribbean EWISACTS. They agreed that the presentations and interactive exercises/discussions were useful and very productive. Participants expressed that what they liked most about the meeting were the presentations made, the information shared, as well as, the opportunities for networking. Participants suggested that more time should be made for discussion and that there should be pre-meeting sectoral consultations. From the 1st Consortium meeting feedback, it was clear that the Consortium mechanism was embraced by all and the expectations are high for the way forward.

Mr. Adrian Trotman, CIMH emphasized that providing a service is more than just providing a product. There is a need for an institution much like CIMH to deliver climate services. CIMH is en route to apply for the RCC status by May 2016. The USAID, the WMO and CIMH will implement the BRCCC Programme in order to work under the GFCS in the Caribbean. Some sectors in different countries may have different needs. Some may even have national programs already in place. He urged each agency represented at the meeting to work together to help build national programs and to work with CIMH to support climate services provision within the region. He ended by stating that USAID liked the idea of the Consortium and wants to send a representative to the Caribbean Climate outlook Forum (CariCOF) to see how the CariCOF works.

3.1 Discussion

The following question was raised by Ms. Patricia Aquing of the Caribbean Water and Wastewater Association (CWWA): What is the extent to which the project can push cross-sectoral collaborations at the national level?

Dr. Roché Mahon, CIMH addressed the question by pointing to the proposed National Sectoral EWISACTs (NSEC) arrangement. The NSEC in its intent and purpose is similar to the Consortium mechanism. It is where the NMHS sits with its six climate-sensitive sectors, and any other sectors that are deemed to be nationally important, to co-design and co-develop climate early warning products.

Mr. Lester Arnold of the Organization of Eastern Caribbean States (OECS) raised the concern that some of the information products are not public enough and does not penetrate down to the end users. He gave the example of Antigua stating that some people and politicians did not

know they were experiencing a drought. He suggested that we must find a way to package the information to allow it to be accessible to the general public. Mr. Adrian Trotman, CIMH responded that he was surprised that persons were unaware of the drought in Antigua as they have one of the best mechanisms for delivering climate information in the Caribbean.

Ms. Patricia Aquing, CWWA raised the question: where are we taking the products? What do we need to bridge the climate information sharing gap? She further went on to assert that climate change is not the first thing on anyone's mind and therefore creative mechanisms are needed in order to get people to start thinking about climate change. She mentioned that there is the need to find a way to deliver that information that it will be accessible and easily understood by the users. She gave an example of the McDonald's Almanac stating that persons know that they can rely on that to know when to plant etc. Mr. Adrian Trotman, CIMH responded by stating that as scientists, they (CIMH staff) don't know always how to deliver the information in a way that understandable to the general public. He went on to state that the Institute needs to include a social science perspective. Ms. Patricia Aquing, CWWA agreed to Adrian's comment and further stated that social sciences need to go hand in hand with natural sciences.

4 Presentation of Conceptual Framework and Methodology for Sectoral EWISACTs in the Caribbean (Presented by Dr. Dale Rankine, CIMH)

Dr. Dale Rankine outlined that oftentimes persons are confused as to the difference between weather and climate. For clarification, he provided the following definitions for weather and climate:

- **Weather:** the state of the atmosphere at a given time and place, with respect to variables such as temperature, moisture, wind velocity, and barometric pressure
- **Climate:** is the long-term (typically 30 years) pattern of weather in a particular area as measured by means variations in several variables.
- **Climate variability:** refers to variations in the mean and variable states of climate (including extremes) at all spatial and temporal scales beyond that of individual weather events. It can be driven by natural or human causes.
- **Climate Change:** distinct change in the measures of climate (rainfall, temperature, etc.) lasting for a long period of time. The change is irreversible. The main focus is on anthropogenic changes.

Dr. Rankine outlined the way in which decisions are made across the weather and climate timescales (see Figure 2)

Figure 2 shows the different temporal scales over which decisions are made as viewed in context of the disaster risk management sector. Weather phenomena are those occurring from minutes to weeks with alerts and forecast providing advance notice to inform emergency response and sectoral planning. Climate variability span timescales from months to years requiring longer-term outlooks and predictions to advance actions for strategic planning, scenario building and government risk financing. Climate change spans decades and centuries that necessitate planning via climate scenarios and decisions are usually informed by international (inter-governmental) climate and policy negotiations. Of note, the longer the lead time required for decision-making, the greater is the level of forecast uncertainty.

EWISACTS: Decision Making Across Timescales

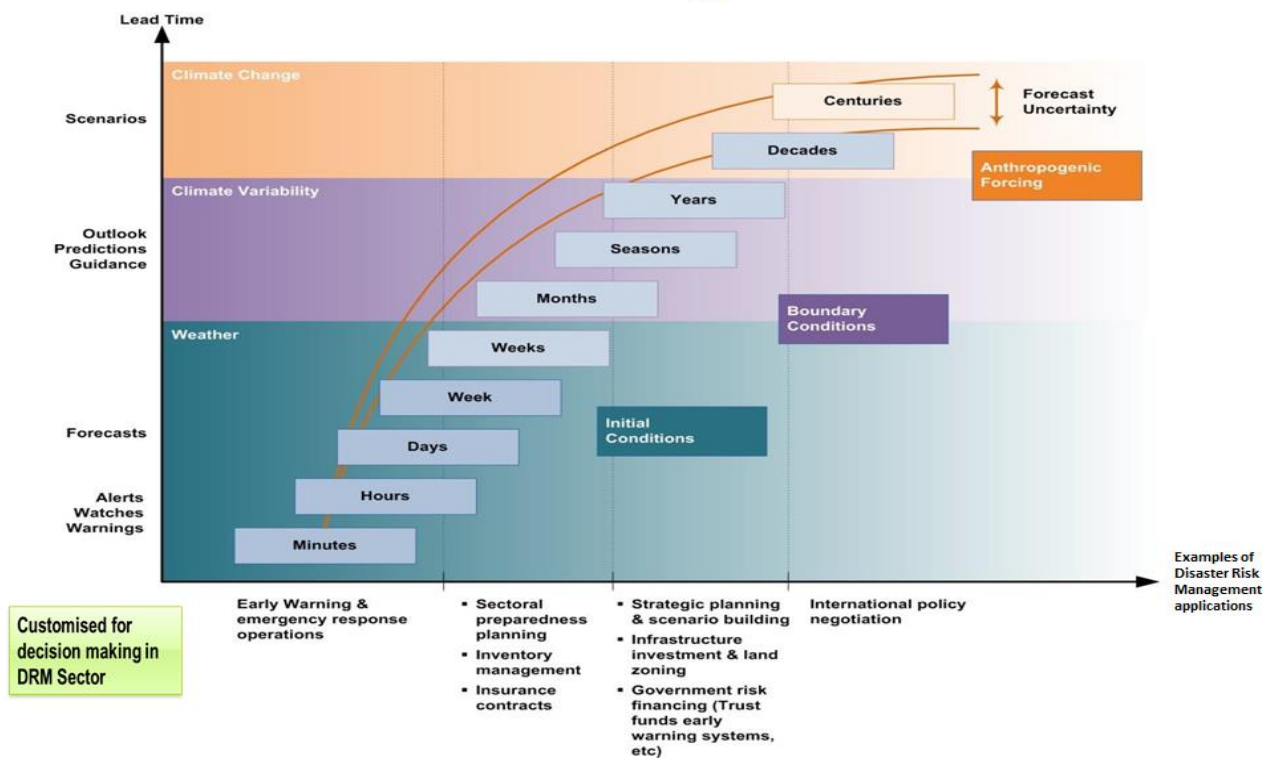


Figure 2: Types of information relevant for sectoral decision-making across timescales (in Disaster Risk Management)

Source: Adapted from WMO (2013)

Dr. Rankine emphasized that Climate Early Warning Information Systems (EWIS) should be people centred and not biased towards the use and application of technology. He further stated that EWIS should be a friendly the system that seeks to provide useful services and timely warning messages for people and communities, which serve to enhance the preservation of lives and livelihoods.

Dr. Rankine further elaborated the two key concepts of the framework:

Early Warning Information System (EWIS): The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities, and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

Early Warning Information System across Climate Timescales (EWISACTs): EWIS that operates across climate timescales from daily, monthly seasonal to decadal and centuries and beyond. It spans the full gamut of climate hazards including extreme events

Dr. Rankine explained that all EWIS must have four major elements, these are namely:

1. Knowledge of the risks faced;
2. Technical monitoring and warning service;
3. Dissemination of meaningful warnings to those at risk;
4. Public awareness and preparedness to act.

Dr. Rankine stated that early warning information systems are useless if they don't prompt some form of action. He explained that if we have a tool and don't know how to use it then it is practically useless. He gave the example using the concept of high pressure stating that persons are more familiar with the term from a health point of view so when persons hear high pressure they think sickness and devastation and as such whenever they hear the term they think along the same lines when in truth from a weather perspective high pressure actually means fair weather. So knowing and understanding early warning information systems how communicate and disseminate the information is of utmost importance.

The structure of sectoral EWISACTs is based on the 5 pillars of the GFCS (Figure 3) and will contribute to the implementation of the GFCS

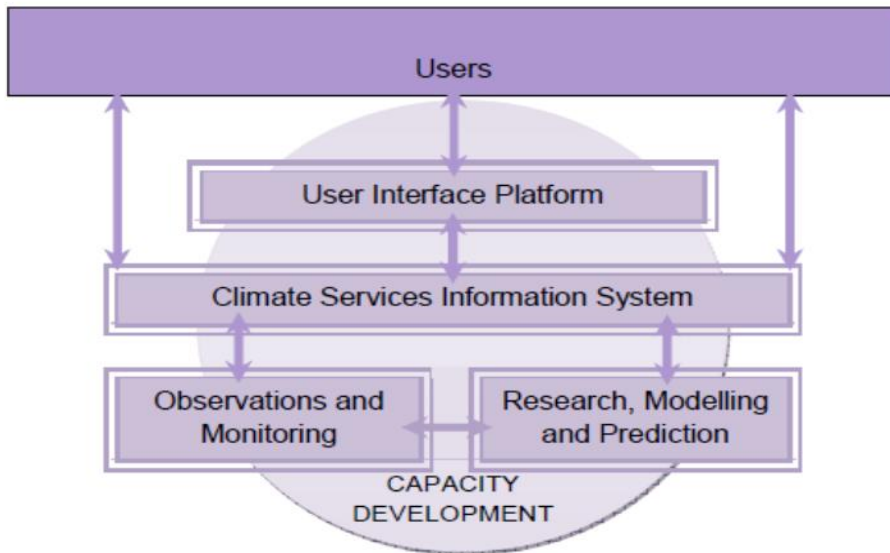


Figure 3: Five Pillars of the GFCS (Pg. 24)
Source: WMO, 2014

The sectoral EWISACTs methodology has 6 steps as can be seen in Figure 4.

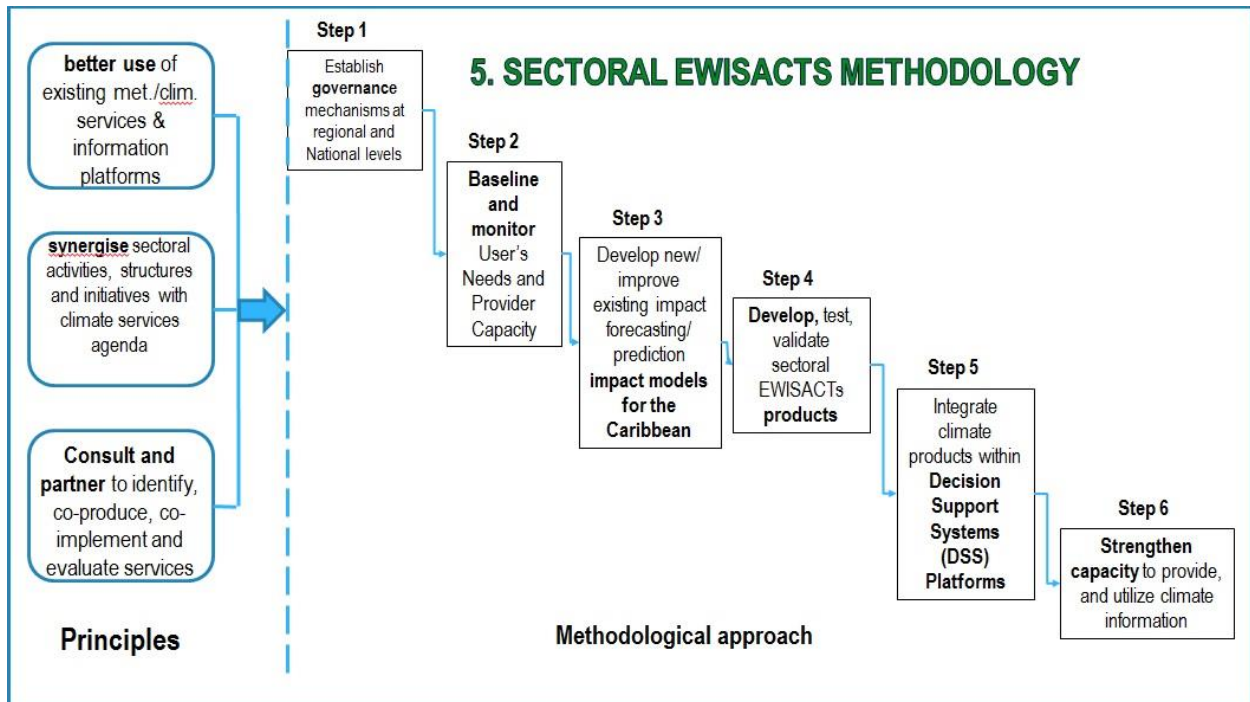


Figure 4: Methodological approach to the development of sectoral EWISACTs

Source: Authors

4.1 Discussion: Feedback from Sectoral Partners on the Conceptual Framework and Methodology (Facilitated by Mr. Adrian Trotman, CIMH)

Dr. Dale Rankine, CIMH posed the question: Should there be joint multi-sectoral meetings or stand-alone meetings with individual sectors?

Ms. Patricia Aquing, Caribbean Water and Wastewater Association (CWWA), preferred multi-sectoral approach because it has the potential to facilitate greater dialogue amongst sectors representatives and allow sectors to learn from other.

Dr. Leslie Simpson, Caribbean Agricultural Research & Development Institute (CARDI) had a different view. He preferred meetings with individual sectors where specific sector needs can be effectively addressed within the relevant sector and its sub-sector environment.

Mr. Adrian Trotman, CIMH followed up by stating that there is merit to both approaches and that they could be jointly pursued with stand-alone sectoral meetings preceding joint and multi-sectoral meetings.

Ms. Elizabeth Riley, Caribbean Disaster Emergency Management Agency (CDEMA) agreed with Mr. Adrian Trotman (CIMH) emphasizing that there is merit in pursuing both approaches. She mentioned as well that it is important to have individual sector discussions and that the CIMH may need to identify areas of congruence and specific nuances that needs to come from adopting each approach.

Mr. Steve Daniels, Ministry of Health, agreed with both Mr. Trotman and Ms. Riley. He mentioned that there is value in both approaches. Individual sectors could meet to develop consensus position among the sectors' members, and then advance the positions in joint meetings when collaborating with other sectors.

Dr. Cédric Van Meerbeeck, CIMH, posited that that when dealing with a new issue it may be best to approach it from a cross (joint) -sectoral approach first as that could help the individual sectors to gain knowledge which can help them within their own sector to achieve a consensus.

Dr. John Mwansa, Barbados Water Authority (BWA) preferred the multi sectoral approach to ensure that each sector understands each other's language, alluding to the example from Dr. Dale Rankine regarding high pressure.

Dr. Roché Mahon, CIMH noted that CIMH intends to apply both approaches since there is merit in both. For example, with Consortium TOR, there is the broad cross-sectoral component for all

sectors and then there are the individual sectoral TORs. The participants agreed that this is a useful way to proceed.

Dr. Cédric Van Meerbeeck, CIMH asked the question: Who thinks the uncertainty of climate forecasts is less uncertain than economic forecasts?

Dr. David Farrell, CIMH, responded by stating that you can bound climate uncertainty as you go out in time but you cannot bound economic uncertainty as you go out in time. Dr. Cédric Van Meerbeeck, CIMH stated that climate predictions has always played out better in the physical realm as opposed to what plays out in the socioeconomic realm.

5 Presentation of the TOR for the Consortium of Regional Sectoral EWISACTs Coordination Partners (Presented by Dr. Roché Mahon, CIMH)

Dr. Roché Mahon, CIMH reviewed the Consortium TOR outlining the changes made since its initial presentation at the 1st Consortium Meeting. Suggestions and feedback were accepted from Consortium representatives as the TOR was being reviewed by Dr. Mahon.

Dr. Mahon started by noting that changes were made on page 1 where the branding and logos were updated.

In addition, some new text refining the language regarding the Consortium as a mechanism for cross-sectoral action was added on page 2, section 2. On page 3, section 2.1, points two and three were switched.

Ms. Elizabeth Riley, CDEMA suggested that the role of the sectoral partners also be from a strategic guidance level and not just a technical guidance level. Ms. Patricia Aquing, CWWA pointed out that CIMH's role should be included section 2.1. Dr. Mahon, CIMH responded by stating that CIMH's role is mentioned in sections 2.1 and 2.3. Patricia Aquing, CWWA stated that it should be explicitly stated under sectoral partners' role in section 2.1.

Ms. Elizabeth Riley, CDEMA suggested that under section 2.3, CIMH should be the more than just Chair but also climate services provider.

Dr. Leslie Simpson, CARDI raised that the Consortium should further think of the role of the Inter-American Institute for Cooperation on Agriculture (IICA) and the Food and Agriculture Organization of the United Nations (FAO).

Dr. Roché Mahon, CIMH continued by outlining the following:

For section 2.2, no were suggestions for amendment were raised.

In section 2.3, for the energy sector representative, the CCREEE replaces the Caribbean Electric Utility Services Cooperation (CARILEC).

For section 2.4, there were no changes.

Ms. Amrikha Singh, CARICOM Secretariat suggested that CARICOM could play their role in points 5 and 6 of section 2.4. She stated that they should be recognized. Ms. Elizabeth Riley, CDEMA agreed with Ms. Amrikha Singh's suggestion and added to that by suggesting that the OECS and CARICOM should be recognized by giving them observer status in order to add a political dimension. Ms. Roxanne Waithe of IICA stated that IICA and FAO see themselves as sectoral partners as it relates to membership of the Consortium and she followed through by asking why the Centre for Resource Management and Environmental Studies (CERMES) was not a part of the Consortium. Dr. Dale Rankine, CIMH responded to MS. Roxanne Waithe by stating that they will be consulted at different points of the sectoral EWISACTs process.

Mr. Adrian Trotman, CIMH cautioned against making the Consortium too large, since this may change the focus from dealing with the matters at hand to managing membership. Dr. David Farrell, CIMH suggested that there should be an insert that allows for the revision of the membership of the Consortium. He stated that CIMH can consider expanding the Consortium after maybe after 3 years. Dr. John Mwansa, BWA mentioned that most persons are always willing to be a part of a process at the beginning but may eventually stop pulling their weight. He suggested that a line be added that states that the Consortium reserves the right to adjust its membership.

Ms. Elizabeth Riley, CDEMA suggested that the Observer point that was suggested for section 2.4 be moved to section 2.5.

Dr. David Farrell, CIMH stated that in order to avoid clashes with other meetings (such as the CariCOF and the CDM Conference), that Consortium meetings should be scheduled with care so as to give it a yearly time slot. Dr. John Mwansa, BWA agreed but asserted that it is not something that should be included in a TOR.

Dr. Roché Mahon, CIMH continued by stating the other changes to the TOR as follows:

In section 2.6 the option of conducting virtual meetings was added.

No changes were made from section 2.7 to section 2.10. In section 2.11, the text was augmented.

Ms. Patricia Aquing, CWWA suggested that the sectoral partners should build EWISACTs into their individual sectoral programmes. Mr. Adrian Trotman, CIMH agreed with the suggestion and further stated that CIMH would continue to source funding to support Consortium meetings.

Dr. David Farrell, CIMH stated that CIMH will continue as Secretariat to the Consortium arrangement beyond January 2017.

6 Presentation of sectoral TORs to support a regional sectoral EWISACTs Coordination Mechanism (Presented by sectoral partners CTO/CHTA/CAST, CARDI, CWWA, CCREEE, CARPHA and CDEMA)

Sectoral participants were invited to present individual sectoral TORs to support a regional sectoral EWISACTs coordination mechanism.

6.1 Tourism Sector – TOR to support a regional sectoral EWISACTs Coordination Mechanism (Presented by Ms. Davina Layne, CTO)

The tourism sector responsibilities will be to:

- a. Support the co-development and co-implementation of a Tourism Sector Work Plan for the period January – December 2016;
- b. Facilitate broader dialogue and sustained engagement with regional and national tourism governance mechanisms, plans and programming
- c. Provide support to the convening of outreach and training (e.g., through sectoral outreach workshops and Dewetra training workshops);
- d. Facilitate the promotion of a tourism sector EWISACTs through existing platforms (e.g., meetings and conferences webinar Series; the CHTA and CTO's websites, as well as, traditional and social media);
- e. Support the conduct of research or a review of research that examines associations between climatic variables and relevant tourism productivity outcomes;
- f. Support the formalization of data sharing arrangements (through MoUs and/or LoAs) between CIMH and the CTO membership;
- g. Facilitate the identification and sharing of textual and georeferenced sectoral datasets for integration into the Caribbean Dewetra platform;
- h. Facilitate the identification and sharing of historical climate-related impact data to Caribbean tourism systems for input into the Caribbean Climate Impacts Database

- i. Assist in the coordination of the receipt of feedback from CTO Member Countries on work related to a tourism EWISACTs (e.g., baseline surveys);
- j. Provide technical input that contributes to the validation and tailoring of tourism climatic bulletins produced by CIMH;
- k. Promote the dissemination of EWISACTs bulletins to the tourism provider community through various platforms (e.g., the CTO website, social media); and
- l. Facilitate the embedding of tourism climate services webpage links hosted on the RCC website with the CTO Resources webpage

After presenting the tourism partner TOR, the tourism representative reported that so far, the tourism sector has:

- CTO:
 - a. Incorporated the work in departmental work plans;
 - b. Presented info on products to the membership including the Board of Directors (SOTIC); and
 - c. Distributed information to the membership and technical committee.
- CHTA:
 - a. Facilitated a webinar and sent out survey & information to the membership; and
 - b. Set up introductions to see whether climate data may be sourced in regards to the tourism sector (natural disaster events) to assist CIMH in their research.

6.2 Agriculture Sector – TOR to support a regional sectoral EWISACTs Coordination Mechanism (Presented by Dr. Leslie Simpson, CARDI)

The Agriculture sector specific responsibilities would be to:

- a. Support the co-development and co-implementation of an Agriculture Sector Work Plan for the period January –December 2016;
- b. Facilitate broader dialogue and sustained engagement with regional and national agricultural governance mechanisms, plans and programming (e.g. through the Ministers of Agriculture);
- c. Provide support to the convening of outreach and training workshops;
- d. Facilitate the promotion of an agriculture sector EWISACTs through existing and proposed platforms (e.g., meetings, conferences such as the Caribbean Week of Agriculture, website, traditional and social media and the forthcoming Caribbean Society for Agricultural Meteorology (CARISAM));

- e. Support the principle of data sharing between CIMH and the CARDI membership;
- f. Facilitate the identification and sharing of textual and geo-referenced sectoral datasets for integration into the Caribbean Dewetra platform;
- g. Facilitate the identification and sharing of historical climate-related impact data to Caribbean agricultural systems for input into the Caribbean Climate Impacts Database;
- h. Support the conduct of research that examines associations between climatic variables and relevant agricultural productivity outcomes (e.g., crop simulation modelling to assess crop sensitivity to temperature and rainfall extremes), as well as, research to identify remedial measures;
- i. Assist in the coordination of the receipt of feedback from CARDI Member Countries on work related to an agriculture EWISACTs (e.g., baseline surveys, the coordination of interviews);
- j. Provide technical input that contributes to the tailoring and validation of Agroclimatic Bulletins produced by CIMH;
- k. Promote the dissemination of climate information to the farming community through various platforms (e.g., CARDI website, social media); and
- l. Facilitate the embedding of agriculture climate services webpage links hosted on the RCC website with the CARDI Resources webpage.

6.3 Energy Sector – TOR to support a regional sectoral EWISACTs Coordination Mechanism (Presented by Dr. Al Binger, CCREEE)

Dr. Al Binger commented that CCREEE is not fully formed as yet and as such there is a concern as to how much resources would be needed to participate in the Consortium. He made his intervention by commenting on some of the clauses (Items hereafter) in the draft energy sector terms of reference (TOR) document. Issues of concerns were specially highlighted. The following were the main points of note:

For item 1 under the energy sector responsibilities Dr. Al Binger indicated that it should not be too difficult for CCREEE to incorporate the sharing of development plans for the renewable energy (RE) and energy efficient (EE) sectors for the CARICOM states (January – December 2016), including the Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS); - [Project pipeline USD1.5 Billion already exists (Solar thermal, fuel switching, RE, EE, and Ocean Thermal Energy Conversion [OTEC])

For item 2 facilitate planning for improved access to modern, affordable and reliable energy services for rural households (especially for lighting), local industry and businesses, including

climate observation networks in support of evaluation of renewable energy potential; this too Dr. Binger felt was achievable.

Item 3; provide updates (and reports) on assessment and identification of renewable energy technologies, including better and quicker means of implementation through technical cooperation, capacity building and tailored climate services. Dr. Binger would like to know would facilitate this and what would be the products.

For item 4, use climate data to assess and report on how hydropower supply may be affected in meeting seasonal energy demands; predict energy production costs, as well as demands for cooling and desalination. Dr. Al binger is interested in knowing how exactly this will be facilitated, he requested a more detailed description in the TOR.

For item 5, provide support for improved planning for periods of increased energy demand required for cooling systems due to higher temperature. Dr. indicated that CARICOM energy unit is already doing some work in that area. He questioned the type of planning that is being referred to and wants to know if it is energy forecasting.

Item 6, facilitate dissemination of advanced warning of:

- a. Reduction in wind, hydro and solar energy production;
- b. Potential damage to energy infrastructure from recurrent climatic events and adaptation to more intense future climatic events;

These were regarded as achievable targets.

For item 7, facilitate broader dialogue and sustained engagement with regional and national energy resource management governance mechanisms, plans and programming (e.g through SIDS Dock, Annual conferences and other duly called meetings of the CCREEE). Dr. Al binger is sought to find out who would be the parties for dialogue and what are the targeted outcomes

He indicated that he has no problem with item 8, facilitate the promotion and adoption of energy sector EWISACTs through existing platforms (e.g., the CREEE website);

For item 9, support the formalization of data sharing arrangements (through Memorandum of Agreements -MoUs and/or Letters of Agreements - LoAs) between CIMH and the CCREEE membership and partners, and through informal relationships, which can be just as useful. Dr. Binger was interested in gaining further details on the nature of these agreements and how they could be executed.

He further commented that items 4, 6 and 9 need well-articulated outputs. He stated that there is need for more conversation between CCREE and CIMH. He emphasized the need to develop detailed TOR with very definitive products, but noted that a useful start had been made.

Item 10, facilitate the identification and sharing of research and historical climate-related impact data related to energy generation and prospecting for renewable energy solutions. provide access to national energy counterparts. This was regarded as an attainable target.

Dr. David Farrell, CIMH commented that as we move towards renewable energy, there is need for more information on weather and climate so that the sector can balance the grid.

6.4 Water Sector – TOR to support a regional sectoral EWISACTs Coordination Mechanism (Presented by Ms. Patricia Aquino, CWWA)

The Water EWISACTs partner will:

- a. Support the co-development and co-implementation of a Water Sector Work Plan for the period January – December 2016;
- b. Incorporation of aspects of the Water Sector Work Plan 2016-2017 into the CWWA (2015-2017) Strategic Plan;
- c. Facilitate broader dialogue and sustained engagement with regional and national water resource management governance mechanisms, plans and programming (e.g., Annual and national meeting, conferences and other duly called meetings of the CWWA);
- d. Provide support to the convening of outreach and training workshops;
- e. Facilitate the promotion of a water sector EWISACTs through existing platforms (e.g., the CWWA website- <http://www.cwwa.net>, social media and publicity platforms of the Caribbean Water Operators Partnership (CariWOP7);
- f. Support the principle of data sharing between CIMH and the CWWA membership and partners;
- g. Facilitate the identification and sharing of textual and georeferenced sectoral datasets for integration into the Caribbean Dewetra platform;
- h. Facilitate the identification and sharing of historical climate-related impact data related to drought and excess precipitation for input into the Caribbean Climate Impacts Database;
- i. Support the conduct of research that examines associations between climatic variables and relevant sector specific outcomes;
- j. Assist in the coordination of the receipt of feedback from CWWA Member Countries on work related to a water resources management EWISACTs (e.g., baseline surveys, the coordination of interviews);

- k. Provide technical input that contributes to the tailoring and validation of water resources management climate bulletins produced monthly by CIMH;
- l. Promote the dissemination of climate information to Water Authorities and water professionals through various platforms (e.g., the CWWA website, social media);
- m. Facilitate the embedding of water resource management webpage links hosted on the RCC website with the CWWA Resources webpage; and
- n. Facilitate (through cost sharing) the meeting of the Consortium within CWWA regional workshops/conferences, where possible beyond the BRCCC Programme.

6.5 Health Sector – TOR to support a regional sectoral EWISACTs Coordination Mechanism (Presented by Ms. Alexandra Duboulay, CARPHA)

As the Health EWISACTs regional sectoral partner, the Caribbean Public Health Agency (CARPHA) is committed to:

- a. Supporting the co-development and co-implementation of a Health Sector Work Plan for the period January – December 2016;
- b. Facilitating broader dialogue and sustained engagement with regional and national health governance mechanisms, plans and programming (e.g., through the annual Chief Medical Officer meeting, the annual Health Minister’s meeting);
- c. Providing support to the convening of outreach and training workshops;
- d. Facilitating the promotion of a health sector EWISACTs through existing platforms (e.g., the CARPHA Annual Scientific Research Conference, the CARPHA website, traditional and social media);
- e. Supporting the principle of data sharing between CIMH and the CARPHA membership;
- f. Facilitating the identification and sharing of textual and georeferenced sectoral datasets for integration into the Caribbean Dewetra platform;
- g. Facilitating the identification and sharing of historical climate-related impact data to Caribbean health systems for input into the Caribbean Climate Impacts Database;
- h. Supporting the conduct of research or a review of research that examines associations between climatic variables and relevant health outcomes;
- i. Assisting in the coordination of the receipt of feedback from CARPHA Member Countries on work related to a health EWISACTs (e.g., baseline surveys, the coordination of interviews);
- j. Providing technical input that contributes to the tailoring and validation of health climatic bulletins produced by CIMH;
- k. Promoting the dissemination of climate information to the health provider community through various platforms (e.g., the CARPHA website, social media); and

- I. Facilitating the embedding of health climate services webpage links hosted on the RCC website with the CARPHA Resources webpage

6.6 Disaster Risk Management Sector – TOR to support a regional sectoral EWISACTs Coordination Mechanism (Presented by Ms. Elizabeth Riley, CDEMA)

The Disaster Risk Management EWISACTS Partner will:

- a. Support the co-development and co-implementation of a Disaster Risk Management Sector Work Plan for the period January– December 2016
- b. Facilitate broader dialogue and sustained engagement with regional and national DRM governance mechanisms (eg. the Comprehensive Disaster Management Coordination and Harmonization Council, National Disaster Management Committees, Country Centered Work Programmes, National Disaster Management Plans
- c. Provide support to the convening of outreach and training workshops
- d. Facilitate the promotion of a DRM sector EWISACTs through existing platforms (eg. Technical Advisory Council (TAC) meetings, the 9th CDM conference, Sector Sub-Committee meetings, the CDEMA website, traditional and social media – eg. CDEMA Twitter account);
- e. Support the principle of data sharing between CIMH and the CDEMA membership;
- f. Facilitate the identification and sharing of textual and georeferenced sectoral datasets for integration into the Caribbean DEWETRA platform;
- g. Facilitate the identification and sharing of historical climate-related impact data to major socio-economic sectors for input into the Caribbean Climate Impacts Database;
- h. Support the conduct of research or a review of research that examines associations between climatic variables and socio-economic outcomes;
- i. Assist in the coordination of the receipt of feedback from CDEMA Participating States on work related to a DRM EWISACTs (eg. Baseline surveys, the coordination of interviews)
- j. Provide technical input that contributes to the tailoring and validation of DRM specific climate bulletins produced by CIMH
- k. Promote the dissemination of climate information to National Disaster Management Organizations; and
- l. Facilitate the embedding of DRM specific webpage links hosted on the RCC website with the CDEMA Resources webpage.

After presenting the TOR, the CDEMA representative informed that thus far CDEMA has made an effort to identify ways to integrate the DRM EWISACTS into their Annual Work Programme.

6.7 Discussion

Ms. Amrikha Singh, CARICOM commented that there is need to get visibility for the sectoral EWISACTs agenda at the political level.

Dr. David Farrell, CIMH recommended sharing data among the Consortium partners as well, and not just between CIMH and Consortium partners. He also suggested that there should be training in predictive systems for water availability which was mentioned at the CariCOF. Ms. Patricia Aquing, CWWA agreed with Dr. David Farrell, that it should be done.

7 Presentation of Sectoral EWISACTs Work and Implementation Plan 2015-2016 (Presented by Dr. Roché Mahon and Dr. Dale Rankine, CIMH)

Dr. Roché Mahon started by outlining the process around the development of the first draft of the WIP, which was developed through internal CIMH discussions from February to early May 2015. At that time, the Institute reviewed and summarized past sectoral activities, identified 10 current gaps and formulated 21 draft outputs across 4 Outcome Areas to address these gaps. These 21 draft outputs were then presented for review by sectoral representatives at the 1st Consortium Meeting. There was further consultation with partners after the Meeting to rationalize the scope of the Outputs and to align these with what could reasonably be achieved throughout the remaining Programme implementation period. The WIP now addressed 8 gaps across 4 Outcome Areas. Proposed outputs were reduced from 21 to 12 and some refinements were made regarding the Output targets.

7.1 Discussion

Dr. David Farrell, CIMH commented that some areas of the initial scope of work was removed because it could not feasibly be completed by January 2017, but there is scope for work to possibly be implemented beyond the BRCCC Programme. Dr. David Farrell, CIMH followed up with a question to the CARICOM Secretariat: What is the level of information and transferability of BRCCC Programme reporting into the CARICOM Monitoring, Evaluation and Reporting (ME&R) structure?

Ms. Amrikha Singh, CARICOM Secretariat answered by stating that everything that is relevant to the Strategic Plan should be reported. If it doesn't fall into a category under the Strategic Plan, then it is not reported.

Ms. Elizabeth Riley, CDEMA commented that she was generally happy with the revised WIP. However, she enquired about the deletion of the proposal to sign MOUs and/or LoAs between

the CIMH and members of the Consortium. She explained that for the sustainability of outcomes, there is value in having signed agreements. The language used in the TORs can form the basis of potential MoUs and/or LoAs.

8 CIMH Early Warning Information Products: An Overview (Presented by Dr. Cédric Van Meerbeeck, CIMH)

The CIMH staff gave presentations on the work that they are doing as it relates to early warning.

Dr. Cédric Van Meerbeeck began by stating that any impactful events can be monitored and to a certain level can be predicted. He introduced CIMH's climate products and tools and where to find them. The products and tools fall into three categories:

1. Communication Products
 - CariCOF Caribbean Outlook Newsletter
 - CDPMN Caribbean Drought Bulletin
 - CariCOF Caribbean Coral Reef Watch
 - Agroclimatic Bulletins
2. Technical Tools
 - Monthly Weather Summaries
 - Caribbean Climate Database
 - Caribbean Climate Impacts Database
 - Caribbean Dewetra Platform
3. Technical Products
 - CDMPN Drought and Precipitation Monitors
 - CariCOF Precipitation and Temperature Outlook
 - CariCOF Drought Outlook
 - CariCOF Wet Days and Wet Spells Outlook
 - Caribbean Climatology Products

Dr. Van Meerbeeck stated that based on the drought monitoring products, the Caribbean is experiencing an on-going drought with countries such Dominican Republic, Antigua and Belize already feeling the effects. He also gave a synopsis of that to expect based on what the climate products and tools are saying:

- Drought will persist

- Implications
 - Reduced recharge of large water reservoirs.
 - Some increase in surface water supply before December
 - Water shortages in 2015-6 tourism season a particular threat
- Precipitation and rainfall frequency outlooks suggest that we should expect less rain and it will fall less often with fewer dangerous wet spells
 - Implications:
 - Reduced flood potential
 - Fewer weather related disruptions of outdoor activities, despite wet season
- The temperature outlooks suggest that it will probably be hotter than usual with temperatures between October and March above- to normal and considerable chances of record-high monthly temperatures
 - Implications:
 - Heat intense in the islands until October
 - Enhanced health risk from heat exposure
 - Higher than usual energy costs for cooling
 - Enhanced wildfire risk

Dr. Van Meerbeeck commented that we expect damage and loss associated with the drought which comparable to 2009-2010, one of the worst droughts on record for the region.

9 ENSO Events Past and Present - Regional Implications (Presented by Ms. Wazita Scott, CIMH)

Ms. Wazita Scott gave a brief overview of the El Niño and La Niña phenomena. She explained that El Niño corresponds with very dry conditions in the Caribbean except for Bahamas and Cuba and it implies fewer hurricanes for the region. She also gave implications of past El Niño events on the different sectors. These consisted of loss of crops for the agriculture sector; a decline in hydro-electricity which resulted in an increased use of diesel resulting in a higher fuel surcharge in relation to the energy sector; for tourism there were several coral bleaching events and; the health sector experienced increased outbreaks of dengue fever due to high temperatures. Ms. Scott also gave an indication of what to expect in the future, stating that 80% of the models forecast that El Niño will persist up until around March through May 2016 and will be one the strongest El Niño in history.

10 Coral Bleaching Early Warning (Presented by Ms. Shelly-Ann Cox, CIMH)

Ms. Shelly-Ann Cox, CIMH began her presentation by outlining the importance of coral reefs and the services they provide. She continued by outlining the threats to corals and gave an explanation about what causes coral bleaching. Using an analogy of a human romantic relationship, she explained that corals have a symbiotic relationship with microscopic algae known as zooxanthellae which lives in their tissues. They are the coral's primary food source and they give the corals their color. When the symbiotic relationship becomes stressed due to factors such as increased ocean temperatures or pollution then the algae leaves the coral tissue. Without the algae the coral loses its food source, turns white and is now susceptible to disease. Sometimes after a bleaching event corals may recover depending on their resilience or they may die. Following that introduction, Ms. Cox informed participants of the Caribbean Coral Reef Watch product that is produced by CIMH in collaboration with NOAA Coral Reef Watch. She mentioned that the bulletin was produced monthly since June 2015 and would only be available every year from May - December during the warmer months where bleaching is likely. She outlined that the bulletin product contained monitoring and forecast products that provides alerts to indicate where bleaching is likely to occur. She mentioned that Coral bleaching monitoring products were released every 2 days and forecasting products were updated on a weekly basis. Figure 5 outlines the classification for the various alert levels. She gave a brief summary of the other information included in the bulletin with emphasis on the impacts.

Alert Level	Interpretation
No stress	No thermal stress
Watch	Low-level thermal stress
Warning	Thermal stress is accumulating
Alert level 1	Bleaching expected
Alert level 2	Widespread bleaching and some mortality expected

Figure 5: Coral bleaching alert levels

Ms. Cox indicated that the National Ocean and Atmospheric Administration (NOAA) has declared the 3rd ever global bleaching event. She indicated that the other global bleaching events occurred in 1998 and 2010 all coinciding with moderate to strong El Niño years. Photos of bleaching in Barbados at 4 different locations and a video of bleaching in Tobago were presented to show the severity of the impacts in previous years. Ms. Cox continued by presenting the outlook highlighting that the current forecast showed high alert levels which means that bleaching in the Caribbean is very likely. She informed those present that there have been reports of bleaching and disease outbreaks in Florida and Cuba with partial bleaching signs observed in the Bahamas, Dominican Republic, Mona islands, Puerto Rico and Turks and Caicos Islands.

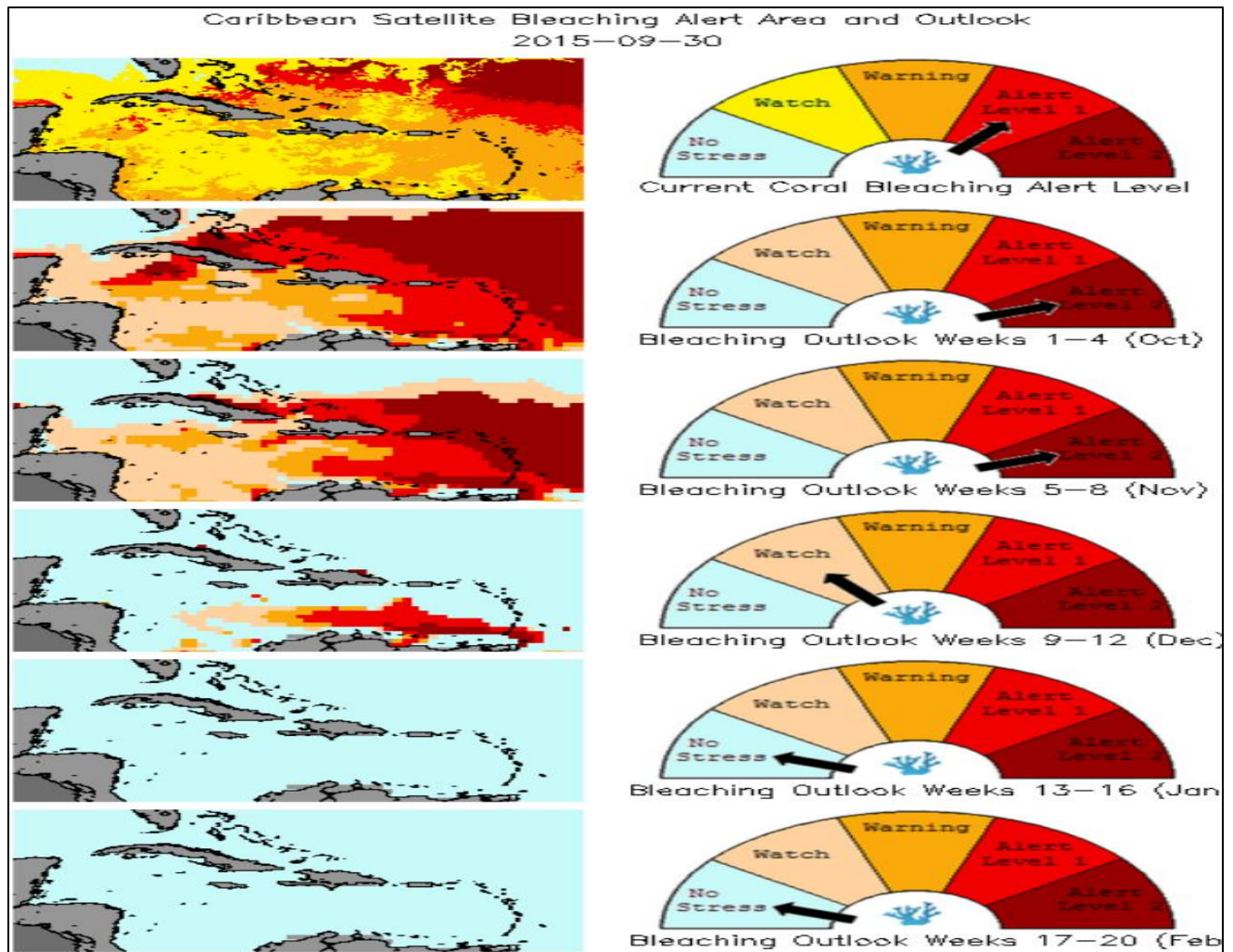


Figure 6: Bleaching alert area and outlook for the Caribbean October 2015 to Feb 2016

Figure 6 shows the bleaching alert levels for the Caribbean. Based on the outlooks, alert level 2 bleaching is expected to take place from weeks 1 to 4 in October and weeks 5 to 8 in November. By weeks 9 to 12 in December the alert level should be at warning and by January and February bleaching is expected to cease.

Ms. Cox continued by outlining the negative impacts of bleaching on the different sectors. She explained that for tourism, there will be negative impacts on dive shops and watersports operators. There will also be a long-term impact on fisheries. She implored stakeholders to develop creative ways to cope with the coral bleaching events such as giving tourists the opportunity to participate in bleaching surveys. She also advised that marine stakeholders should foster partnerships with each other to develop coral bleaching response plans. In

closing, she shared 10 ways to protect coral reefs and reminded participants of their personal responsibility to the environment.

10.1 Discussion

Mr. Lester Arnold, OECS raised a concern stating that the forecast for November to February shows dark levels meaning alert level 1. Then no alert level showed in the follow up forecast. Ms. Shelly-Ann Cox, CIMH responded by explaining that Hurricane Joaquin caused the stirring up of cooler waters in the Bahamas waters so the temperatures that would have caused the corals to bleach were no longer there.

Ms. Patricia Aquing, CWWA expressed her concern where hotels are issuing warnings about turning off water in the hotels to conserve water but not making efforts to investing in low flush toilets. She suggested that this should be tied into government policy as well as for government to give incentives to support these initiatives. Dr. Cédric Van Meerbeeck, CIMH agreed with Ms. Patricia Aquing by giving an the example of a hotel in Puerto Rico having double tubs that gets filled within 5 minutes while houses next to the hotel have been without water for weeks Ms. Patricia Aquing followed through by stating that there needs to be introduction of new engineering solutions to taps that has to be turned on for at least 2-5 minutes before hot water starts flowing and explained that this action wastes gallons of potable water daily.

11 Review of Day 1 and Introduction to Day 2

Mr. Adrian Trotman, CIMH reviewed the proceedings of Day 1 of the 2nd Consortium Meeting. Key to his review was the provision of a summary of the recommendations for amendment related to the Consortium TOR document. These adjustments include:

- Making CIMH's role as Chairman and provider of climate services more explicit;
- Inclusion of a clause stating that the Consortium will have the authority to review its membership;
- Inclusion of a clause giving Observer status to certain organizations – Two (2) organizations were explicitly mentioned (CARICOM and the OECS Commission), with the understanding that other organizations may be added in the future; and
- Consideration by CIMH of the drafting and signing of Letters of Agreement with sectoral partners.

12 Review of Sectoral EWISACTs Work Plan Implementation (Presented by Dr. Roché Mahon, CIMH)

Dr. Roché Mahon outlined the progress made against each proposed sectoral EWISACTs Output since the 1st Consortium Meeting.

A new proposal was raised by CIMH regarding the development of a Consortium landing page and associated functionalities (e.g., a calendar where sectors can insert important sectoral meeting dates, a members only area accessible through login). Ms. Elizabeth Riley, CDEMA endorsed the idea and further recommended that there be an online discussion forum where sectoral heads should meet regularly to discuss what work they are engaged in and what strategies they used that was successful, she suggested that this could be done online quarterly. Ms. Patricia Aquing, CWWA also endorsed the idea of the online discussion forum and proposed that CIMH consider convening technical sectoral webinars. CIMH agreed to include both proposals into the revised version of the WIP document.

Mr. Adrian Trotman, CIMH raised the question: How many sectors have climate change plans? Mr. Damion Hinds, IICA responded by stating that IICA has climate change plans at the hemispheric, as well as, individual country level. Ms. Patricia Aquing, CWWA raised a concern that the issue of climate change/variability is talked about but the planning is not actually carried out. Speaking on behalf of CWWA, she mentioned that the water sector did not have a climate change plan in place. She stated that there is more of a reactive approach where the sector acts after the storm hits. Mr. Charleston Lucas, Ministry of Agriculture commented that climate change has been taken fully on board, however, they still have some work to do as it relates to water efficiency.

Mr. Adrian Trotman, CIMH asked whether the sectors are keeping abreast of the work that CIMH, Caribbean Community Climate Change Center (CCCCC) etc. are doing as it relates to climate information. He stated that he would be surprised if the focal points on climate in the various organizations were unaware of the work of the CIMH. If that is the case, this an indication of a gap in the communication of information. Mr. Steve Daniels, Ministry of Health raised the question: How easy is it to access CIMH's products? Dr. Cédric Van Meerbeeck, CIMH responded explaining that products are freely available on the CIMH and RCC websites.

Ms. Elizabeth Riley, CDEMA raised the question: How are the EWISACTs going to be led at the national level and what is the role of the national meteorological services?

Mr. Adrian Trotman, CIMH stated that in order to understand how to operate in the region, we need to understand how the organization organizes their climate plans. CIMH must understand how regional and national sectors are implementing climate change services/adaptation. There must be focal point and focal teams; they must also be knowledgeable of what information is available. Ms. Elizabeth Riley, CDEMA suggested that there should be a slot at a future forum of the CCCCC so that the climate change focal points can be informed about the sectoral EWISACTs initiative. Mr. Adrian Trotman, CIMH stated that climate must be dealt with first and foremost and we need to know what is out there at the regional level before we can form a strategy. Mr. Lester Arnold, OECS Commission commented that sectors usually do not communicate with each other so it might be helpful to have a national EWISACTs meeting.

Ms. Amrikha Singh, CARICOM Secretariat, mentioned that there is an issue with capacity as it relates to the number of people that CARICOM could send to global climate change negotiations. They usually have to be spread between wider sub-committees with the result that CARICOM is usually underrepresented at international negotiation meetings.

Ms. Amrikha Singh, CARICOM Secretariat stated that unless there is an actual interest, people generally don't concern themselves with climate information. Ms. Patricia Aquing, CWWA explained that there is currently a top down mechanism. She mentioned that perhaps instead there should be a bottom up approach to climate strategizing where users are directly involved from the beginning.

12.1 Final Review of the revised Work and Implementation Plan (Presented by Dr. Roché Mahon, CIMH)

Dr. Roché Mahon reviewed the amendments to the WIP based on the recommendations raised by Consortium members on Day 1 of the 2nd Consortium Meeting.

Ms. Patricia Aquing, CWWA raised the need to build the capacity of regional institutions on the climate service agenda. She enquired about what arrangements are in place to do this. Mr. Adrian Trotman, CIMH responded stating that Consortium partners are kept in mind as it relates to capacity issues. He informed that every Consortium member will be invited to all CariCOF meetings. Mr. Adrian Trotman, CIMH informed the participants that in February 2016, there will be an Environment Canada-funded project workshop on developing climate indices for sectors, and he indicated that all Consortium members will be invited to take part.

Ms. Patricia Aquing, CWWA made an enquiry as to whether there were any opportunities for CWWA to send members to complete an internship at CIMH to get hands on training. She stated that her membership is always interested in opportunities for personal development.

Mr. Trotman informed that that there are internship opportunities that are available under the BRCCC Programme.

13 Presentation of preliminary Provider Baseline Survey Results (Presented by Dr. Dale Rankine, CIMH)

Dr. Dale Rankine presented the results of the Provider Baseline Survey. He informed that the BRCCC Postdoctoral Researchers surveyed 15 National Meteorological and Hydrological Services (NMHS) in the Caribbean; surveys were issued live and remotely and took an average of 1 hour and 10 minutes to complete. The respondents were willing to participate in the survey. They were also 2 non-member states surveyed: Aruba and St. Marteen. The survey was based on 5 pillars of the GFCS.

The results showed that size and institutional capacity vary among member states. Sixty seven percent (67%) of the NMHS offer some kind of climate services and have been doing so for the last 1-3 years; this is mainly due to the work of CariCOF. Sixty seven percent (67%) of the respondents reported that they were not aware of organizations that deliver climate services. Majority of the respondents, sixty seven percent (67%) are government funded. Almost all of the respondents (93%) have attended a CariCOF session and agreed that CariCOF have helped them. All of the respondents are aware of Dewetra but about half of the respondents have never used it.

In conclusion, Dr. Dale Rankine informed that the results suggested that the capacity to deliver climate services is not-uniform. The NMHSs are generally interested in increasing climate services but are resource challenged especially in the area of funding. There is some knowledge of CIMH tools and products but the use depends on local capacity and also the primary focus of the Met office. The CariCOF is Training and capacity building are key needs. Dewetra is deemed to be very useful but routine usage and application are very low.

Mr. Adrian Trotman, CIMH commented that he is not surprised about the Dewetra usage, as not all members of NMHS got exposed to Dewetra training. He further stated that Dewetra was developed for the Caribbean under a project that focused on the OECS and Barbados.

14 Presentation of preliminary User Baseline Survey Results (Presented by Dr. Roché Mahon, CIMH)

Dr. Roché Mahon presented the preliminary results of the User Baseline Survey. She informed that the User Baseline Survey was a paper-based survey of sectoral participants in a dedicated

session on Day 1 of the 2015 Wet Season CariCOF. A total of 33 out of 35 sectoral stakeholders participated in the survey. Of these, there were 32 useable responses giving a 91% effective response rate. Responses were coded for the purpose of the analysis and descriptive statistics run in Microsoft Excel using an available-case analysis approach.

She first discussed the nature of the sample and noted that the majority of respondents were in leadership and/ or technical positions in the Agriculture and Food Security, Water and Disaster Risk Management sectors. The results showed that there was no representation from the health and energy sectors. More than 80% of the respondents used climate information and 65% does not have in-house climate expertise. A large percentage of respondents (58%) use weather forecasts to help inform and manage their day-to-day operational activities. By contrast, climate information is mainly used to inform strategic planning, and to inform and manage day-to-day operational activities. This for example is the main use of seasonal climate forecasts.

The most used weather and climate information in the very short to short-term (every day to every month) are weather forecasts. Respondents tend to use seasonal climate forecasts on the 1 month and 6 month timescale. The main sources of weather and climate information are the NMHSs, the CIMH and Government agencies/departments. Respondents rely on the NMHS mainly for past climate data (32%), past weather data (27%) and weather forecasts (27%). By contrast, respondents look to CIMH for seasonal climate forecasts (31%), inter-annual climate predictions (22%) and climate change projections (12%).

The most prominent barrier to using climate information is the lack of in-house expertise (62% agree). The next prominent barrier is respondents' perceptions that the level of detail of existing climate information is not appropriate to support organizational decisions (25% agree and 17% strongly agree). Respondents rated the usability of the synthesis products (e.g., CariCOF Outlook Newsletter) the highest and low awareness and perceptions of usability of Dewetra. All respondents agreed that the Caribbean should continue to invest in building its climate services capacity through a Caribbean Framework for Climate Services. Most respondents agree (66% agree and 28% strongly agree) that they would like to gather climate information on their own at a user-friendly and easily accessible website. Respondents indicated a high level of future involvement in the BRCCC Programme.

There were some limitations to the survey that limits the interpretation of its results. Since the method applied was a non-random, convenience sampling of 32 respondents, the survey results, although insightful for drawing a preliminary picture should not be used to draw firm conclusions. Dr. Mahon noted that representatives from the tourism, health and energy sectors

were under-represented and representatives from 5 CMO States were not represented. She indicated that there will be similar surveys in the near future and there is expected to be collaboration with sectoral partners to achieve this. The set of baseline questions are expected to be expanded, new data will be added to the dataset and the results will be re-analyzed. There is also expected to be the conduct in-depth focus groups and one-on-one interviews to qualitatively supplement the quantitative results.

14.1 Discussion

Mr. Adrian Trotman, CIMH commented that for climate information users, the packaged products were the most used, pointing to the example of the Drought Bulletin. He said that the tailoring of products specifically for sectors is also required. RCCs are mainly to support the NMHSs, but CIMH sees an additional role of the Caribbean RCC to provide tailored products in support of NMHSs with limited capacity.

Ms. Elizabeth Riley, CDEMA commented that there is need for capacity building at the national level and that the RCC should be able to measure results and change at the end of the Programme period. She also indicated that CDEMA is prepared to make space for CIMH during their CDM conference for the conduct of the baseline surveys.

15 Presentation and testing of Draft Climate Product Information Sheets (Presented by Ms. Shireen Cuthbert, CIMH)

Ms. Shireen Cuthbert, CIMH, gave a brief overview of the Climate Product Information Sheets, including their development process, intended purpose and format. She then solicited feedback from the members of the Consortium and explained that their input was essential to ensure that the information sheets were tailored to their needs. Participants were asked to split into three groups to review the sheets and determine if content was:

- Easy to understand;
- Applicable to their sector;
- Missing information for their sector, and
- Interesting enough to make their sectors and stakeholders want to use the products.

Following their review, groups were asked to discuss their recommendations for making the Climate Product Information Sheets better aligned with their sectors. The results of the feedback are shown in Appendix C.

16 Presentation of updated TOR documents based on feedback from Day 1 (Presented by Dr. Roché Mahon, CIMH)

Dr. Roché Mahon informed the members of the Consortium of the changes made to the TOR based on the recommendations of the Consortium members on Day 1 of the 2nd Consortium Meeting. The changes are as follows:

- Section 2.1 Role, the words “strategic and” was added to point 1.
 - Point 1 now reads – Provide strategic and technical guidance and support to CIMH on the development and implementation of regional sectoral EWISACTs
- Section 2.3 Membership Point 2 was removed
 - Point 2 read Energy – Caribbean Centre for Renewable Energy Efficiency (CREEE)
- Point 6 – The words “and climate services provider”
 - Point 6 now reads – Chair and climate services provider – Caribbean Institute for Meteorology and Hydrology (CIMH)
- The following sentences were added to section 2.3
 - Particular consideration will be given to a regional organization that will support the Energy portfolio of the Consortium.
 - The Consortium reserves the right to review membership status periodically and make adjustments in this regard.
- New section added at section 2.4
 - 2.4. Observer Status
 - To facilitate broader consensus and buy-in, observer status will be accorded to relevant regional level organizations, namely the CARICOM Secretariat and the Organization of Eastern Caribbean States (OECS).
 - The Consortium reserves the right to review observer status periodically and make adjustments in this regard.
- Appendix 1, section 1 introduction:
 - Line 2 the word seven (7) was changed to six.
 - Lines 5 to 7 the sentence “3) the Caribbean Centre for Renewable Energy and Energy Efficiency (CREEE) as the Energy EWISACTs regional sectoral partner” was removed from the paragraph.

17 Adoption of Consortium Documents (Facilitated by Mr. Adrian Trotman, CIMH)

Mr. Adrian Trotman, CIMH solicited the approval of Consortium members regarding the adoption of the meeting documents. Each sectoral representative was individually asked whether they agreed to adopt, or alternatively whether they disapproved of the adoption of the Consortium meeting documents. Each sectoral representative gave their approval and the following was moved by Mr. Trotman:

- Adoption of Draft Conceptual Framework;
- Adoption of Consortium and Sectoral Partner TORs; and
- Adoption of Draft Work and Implementation Plan 2015-2016.

It was agreed that the Report of the 1st Consortium Meeting would be shared via Dropbox with Consortium members.

18 Closing Remarks (Presented by Mr. Adrian Trotman, CIMH)

Mr. Adrian Trotman, CIMH ended by stating that the Consortium Members will be working to close the gaps identified in the BRCCC Programme. He stated that the tourism sector was added to the Consortium Membership because the sector plays a significant role in building Caribbean economies and it also brings a significant private sector component. Going forward, Mr. Trotman indicated that CIMH will be connecting with heads of regional sectoral agencies to work towards the signing of Letters of Agreement (LoAs) to formally establish the Consortium.

REFERENCES

- WMO, USAID, & CIMH. (2014). *Programme for Building Regional Climate Capacity in the Caribbean: Programme Document*. World Meteorological Organization. Geneva.
- WMO. (2013). *The Global Framework for Climate Services*. Presentation to the Regional Workshop on Climate Services at the National Level for Small Island Developing States in the Caribbean. Port of Spain, Trinidad and Tobago, 29-31 May 2013
- WMO. (2014). *Health Exemplar to the User Interface Platform of the Global Framework for Climate Services* Retrieved from http://www.gfcs-climate.org/sites/default/files/Priority-Areas/Health/GFCS-HEALTH-EXEMPLAR-FINAL-14152_en.pdf

19 Appendix A: 2nd Consortium Meeting Agenda

**Programme for Building Regional Climate Capacity in the Caribbean
(BRCCC Programme)
Second (2nd) Meeting of the Consortium
of Regional Sectoral EWISACTs Coordination Partners
CIMH, Husbands, St. James
October 21st – 22nd, 2015**

Meeting Objectives:

1. To formalize the Consortium arrangement through the endorsement and adoption of a Consortium of Regional Sectoral EWISACTs Coordination Partners Terms of Reference (TOR);
2. To confirm sector partners through the endorsement and adoption of Sectoral EWISACTs Coordination Partners TORs;
3. To endorse and adopt a Conceptual Framework and Methodology for sectoral EWISACTs development in the Caribbean;
4. To endorse and adopt a Work and Implementation Plan (WIP) for sectoral EWISACTs development in the Caribbean;
5. To discuss regional and national perspectives on early warning and response to the potential impacts of El Niño 2015-2016;
6. To showcase new early warning information products; and
7. To report on progress to date on the development of sectoral EWISACTs.

Wednesday 21 October

TIME	SESSION		RESOURCE AGENCY/PERSON
8:30 – 9:00	Arrival and registration		All
9:00 - 9:15	Welcome remarks		Dr. David Farrell, CIMH
9:15 - 9:35	Introduction of participants/Icebreaker Meeting objectives and adoption of Meeting Agenda		Mr. Adrian Trotman/ Ms. Shelly-Ann Cox, CIMH
9:35 – 9:55	Session 1 Review of 1 st Consortium Meeting documents	Presentation of the Report of the 1st Consortium Meeting	Mr. Adrian Trotman, CIMH
9:55 – 10:10		Discussion	All
10:10 – 10:25	Coffee break		
10:25 – 10:45	Session 1 Cont'd Review of 1 st Consortium Meeting documents	Presentation of Conceptual Framework and Methodology for Sectoral EWISACTs in the Caribbean	Dr. Dale Rankine, CIMH
10:45 – 11:00		Discussion	All
11:00 – 11:15		Presentation of TOR for the Consortium of Regional Sectoral EWISACTs Coordination Partners	Dr. Roché Mahon, CIMH
11:15 – 11:30		Discussion	All
11:30 - 12:30	Lunch		
12:30 - 1:30	Session 1 Cont'd Review of 1 st Consortium Meeting documents	Presentation of sectoral TORs to support a regional sectoral EWISACTs Coordination Mechanism (<i>10 minutes per sectoral presentation</i>)	CARDI/ CWWA/ CREEE/ CARPHA/CDEMA/CTO/CHTA CAST
1:30 – 1:50		Discussion	All
1:50 – 2:10		Presentation of Sectoral EWISACTs Work and Implementation Plan 2015-2016	Dr. Roché Mahon/Dr. Dale Rankine, CIMH
2:10 – 2:30		Discussion	All
2:30 – 2:45	Coffee break		
2:45 – 3:00	Session 2 ENSO and Early Warning	CIMH Early Warning Information Products: An Overview	Dr. Cédric Van Meerbeeck
3:00 – 3:15		ENSO Events Past and Present - Regional Implications	Ms. Wazita Scott, CIMH
3:15 – 3:30		Coral Bleaching Early Warning	Ms. Shelly-Ann Cox, CIMH
3:30 – 4:25		Discussion	All
4:25 – 4:35		Summary and Close	Mr. Adrian Trotman, CIMH

Thursday 22 October

TIME	SESSION		RESOURCE AGENCY/PERSON
8:30 – 9:00	Arrival		All
9:00 – 9:10	Review of Day 1 and intro to Day 2 sessions		Mr. Adrian Trotman, CIMH
9:10 – 9:25	Session 3 Sectoral EWISACTs development - Progress to date	Review of Work Plan Implementation	Dr. Dale Rankine/ Dr. Roché Mahon, CIMH
9:25 – 9:40		Discussion	All
9:40 – 9:55		Presentation of preliminary User Baseline Survey Results	Dr. Roché Mahon , CIMH
9:55 – 10:10		Discussion	All
10:10 – 10:25		Presentation of preliminary Provider Baseline Survey Results	Dr. Dale Rankine, CIMH
10:25 – 10:40		Discussion	All
10:40 – 10:55		Coffee break	
10:55 – 11:55	Session 3 Cont'd Sectoral EWISACTs development - Progress to date	Presentation and testing of Draft Climate Product Information Sheets	Ms. Shireen Cuthbert, CIMH
11:55 – 12:00	Session 4 Adoption of key documents and Way forward	Adoption of 1 st Consortium Meeting Report	All
12:00 – 12:05		Adoption of Draft Conceptual Framework	All
12:05 – 12:10		Adoption of Consortium and Sectoral Partner TORs	All
12:10 – 12:15		Adoption of Draft Work and Implementation Plan 2015-2016	All
12:15 – 12:25		The Way Forward and Close	Mr. Adrian Trotman, CIMH
12:25 - 1:25	Lunch		

20 Appendix B: Participant List

	Name		Organisation	Country	Contact
	Last	First			
1	Simpson	Leslie	CARDI	Jamaica	leslieasimpson2000@yahoo.co.uk
2	Daniel	Steve	Ministry of Health	Barbados	steve.daniel@health.org
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28	Depradine	Wayne	CIMH	Barbados	wdepradine@cimh.edu.bb

21 Appendix C: Feedback on Draft Climate Product Information Sheets

General feedback:

- What happens if you are not in one of the sectors identified? Some qualification is required before listing the sectors on the bulletin
- Content a bit too generic. CWWA, CARDI identified the implications for the generic information when wanting it to address the needs of users. The target audience needs to be clearly identified
- Bulletin needs an integrity presence. Recommendation is to put CIMH RCC and reduce the size of the BRCCC – brand the product with CIMH for credibility point.
- Tourism sector finds it difficult to see how easily they can use our tools to put stuff into action.

A. CariCOF Caribbean Climate Outlook Newsletter

1. Replace “roundup” with “summary

2a. Move information on emergency transportation from Health Sector to Disaster Management Sector

2b. Remove “preposition” under Disaster Management Sector. Prepositioning is associated with response while for mitigation it is really an identification process

3. Feedback from CARDI, CDEMA, CWWA, CZMU:

Caribbean Climate Outlook Newsletter language seems to be targeting researchers. Again, this ties back to who are the intended beneficiaries of the newsletter.

B. CariCOF Seasonal Climate Outlooks

1. Add in “period” after three-month (first bullet point under What is it?)

Revised sentence should read:

Maps detailing minimum, mean and maximum temperature and precipitation forecasts across the region for a three-month period.

2. Shows temperature and precipitation but is called Seasonal Climate Outlooks.

3. Feedback from CARDI, CDEMA, CWWA, CZMU:

Seasonal Climate Outlook – The text under “What is it” need to be re-visited. It is not easy to understand. It will be important however to clearly identify the end users.

C. CariCOF Drought Outlook

1. Add in “help prepare for drought trends” under Health Sector.

Revised paragraph should be:

The Health Sector implement disease surveillance; manage the distribution of emergency water supply to help prepare for drought trends.

2. From CARDI, CDEMA, CWWA, CZMU:

Clarity needed between the Caribbean Drought Bulletin and the Drought Outlook. CWWA – the end user will require the information contained in the two documents. There may be a need to merge or tailored into a package.

3. From the AGRI SECTOR - As it relates to drought, it affects sectors and it affects the general public. Add the general public to the listing which may address those who are missing (point made above).

4. From the DRM SECTOR – the wording needs to be re-visited. The current wording is for the Water Resources. Recommended language: Guide coordination actions for a Drought Response.

D. Caribbean Drought Bulletin

1. Change “timescales” to “time periods” or “duration” (under What is it? And under Agriculture)

2. Add “limited water supply for sanitation” under Health Sector.

Revised paragraph should be:

The Health Sector examine drought conditions to prepare communities for risk including limited access to food, clean water supply, diminished air quality and limited water supply for sanitation.

3. From the AGRI SECTOR - As it relates to drought, it affects sectors and it affects the general public. Add the general public to the listing which may address those who are missing (point made above).

4. From the DRM SECTOR – the wording needs to be re-visited. The current wording is for the Water Resources. Recommended language: Guide coordination actions for a Drought Response.

5. From CARDI, CDEMA, CWWA, CZMU:

Clarity needed between the Caribbean Drought Bulletin and the Drought Outlook. CWWA – the end user will require the information contained in the two documents. There may be a need to merge or tailored into a package.

6. Bulletin needs an integrity presence. Recommendation is to put CIMH RCC and reduce the size of the BRCCC – brand the product with CIMH for credibility point

E. Caribbean Climatology Tools

1. Change title to Caribbean Climatology Resources.
2. Keep existing graph and add in map from previous version to the left (not SPI)
3. Indicate whether El Niño / La Niña years are identified