Caribbean Drought Training Workshop, BRCCC Program (Report)

January 20th – 23rd 2015

Caribbean Institute for Meteorology and Hydrology

Husbands, St. James Barbados

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The Caribbean Drought Training Workshop is a key component of the Programme for Building Regional Climate Capacity in the Caribbean (BRCCC program) that is funded via the United States Agency for International Development (USAID), thanks to the generosity of the American People. It was held at the Caribbean Institute for Meteorology and Hydrology (CIMH) and attended by personnel from the National Drought Mitigation Centre (NDMC) of the USA (Trainers); National Meteorological Services and water agencies from across the Caribbean, as well as agricultural services; the finance sector; tourism; disaster management, the Fire Service and the Media from Barbados (*see Appendix A*).

Background of BRCCC

The Building Regional Climate Capacity in the Caribbean (BRCCC) Project was created to facilitate the development of the WMO Regional Climate Centre for the Caribbean to be housed at the Caribbean Institute for Meteorology and Hydrology (CIMH) through: (i) infrastructure development, (ii) increasing the range of products and services delivered to stakeholders, (iii) enhancement of human and technical capacities at CIMH and in National Meteorological and Hydrological Services in the Caribbean and (iv) improvement of service delivery mechanisms to national, regional and international stakeholders.

It is expected that the project will improve the range of climate related products and services that will be available at the appropriate spatio-temporal scales, to decision-makers for effective decision-making in the Caribbean. This will ultimately result in the support of sustainable development of the Caribbean region.

Welcome speeches

Dr. David Farrell (Principal, CIMH)

Dr. Farrell welcomed all participants to the workshop and to CIMH. He also thanked personnel from the University of Nebraska partnering with the BRCCC project. Dr. Farrell sees this as not just a CIMH

[1] Caribbean Institute for Meteorology and Hydrology

partnership but a regional one. He revisited the 2009/10 drought event and associated impacts across the region, mentioning that it forced the Heads of Government to discuss coping strategies for such an event. Dr. Farrell indicated that this drought taught us that we in the region were not really ready for an event of this magnitude. However, as he highlighted, the Caribbean Drought and Precipitation Monitoring Network (CDPMN), which was launched in 2009 supported regional governments by updating on the status of the event, and providing forecasts and advice. Dr. Farrell views this workshop as a continuation of an initiative in building capacity and resilience and he hopes that the knowledge transferred continues to be of significant benefit.

Ted Lawrence (USAID[2])

Mr. Lawrence welcomed all participants to the workshop. He highlighted one of the critical issues to address climate change is an improved quality of data. Mr. Lawrence considers training to be an important step in addressing more severe drought as it will help the region to better understand changes and to increase resilience. He also highlighted a challenge in the region is the information to the decision makers and challenges the participants to think about how they can do the analysis to provoke real action.

Mark Svoboda (NDMC)

Mr Svoboda welcomed all participants on behalf of the NDMC as they were looking forward to provide the required training support. He was hopeful that this initiative will be successful; as he had seen success with a recent workshop within the region.

Workshop background and Objectives (Adrian Trotman, CIMH)

After a short segment when participants were allowed to pose questions directly to the USAID representative, Mr. Trotman outlined the background and objectives of the meeting. He first elaborated on CIMH's mandate and functions. Some of these functions include:

- A centre for research in meteorology, hydrology and associated sciences
- A regional climate data centre
- Regional Centre of excellence for Satellite Meteorology
- World Meteorological Organization (WMO) Regional Training Centre
- WMO Regional Climate Centre, (in Demonstration Phase)
- Advisor to regional governments on matters related to meteorology and climatology

As to the background, Mr. Trotman highlighted the important role of the Caribbean Drought and Precipitation Monitoring Network (DPMN). He reported that the CDPMN potential importance to the region was exemplified just months after its establishment in January 2009, when it was realised that the region was on the brink of one of its more severe droughts in four to five decades. The CDPMN monitored the situation and with the support of the regional precipitation outlooks, also produced by CIMH, advised Governments as to the extent and potential cessation of the impacts from the drought. He also summarised a background paper submitted to the Global Assessment Report in 2011 that was a collaboration between CIMH and the then Caribbean Environmental Health institute (CEHI). Some of the

[2] United States Agency for International Development

work presented in this report was based on a document prepared by these two regional organizations for the Head of Government of the Caribbean, after their call for information to support a response to the impacting circumstances surrounding the drought episode.

Mr. Trotman therefore outlined the objectives of the Workshop as to:

- Elaborate on existing actions under the CDPMN[3]
- Calculate and use multiple drought indices and indicators
- Develop drought policies and plans (with the focus of establishing plans for national drought monitoring)

Activities

Participants were able to engage in some important exercises that were key to the outcome of the workshop and future activity in drought early warning in the region. These activities involved:

1. Calculations of the Standardised Precipitation Index (SPI), Standardised Precipitation Evaporation Index (SPEI) and Palmer Drought Severity Index (PDSI) via index generators to estimate drought severity at varying timescales.
2. Interpretation and relaying of climate information to the public (including climate-sensitive sectors). Participants were given a rainfall and drought outlook[4] and an SPI map, and were requested to interpret them to give information based on what is likely to happen in the coming months.
3. Reporting climate impacts for ingestion into the Caribbean Climate Impacts Database – a simulation exercise.
4. The development of a skeleton Drought Early Warning Information Systems (DEWIS) plan that included the goals and objectives, members, Terms of Reference and Scopes of Action of the working groups or networks overseeing (i) National Drought Monitoring (including forecasting), (ii) Awareness and Education, (iii) an information portal and (iv) research; with the entire activity being under the supervision of a DEWIS committee. At this workshop Barbados was represented by the largest and a more realistic compliment of agencies necessary for production of a drought management plan. Click here to view the skeleton draft plan from the Barbados participants.

Presentations

The following is a summary of presentations given during the workshop.

Regional Drought Monitoring and Forecasting (Anthony Moore, CIMH)

Drought monitoring in the Caribbean is supported by analyses of SPIs and Deciles (a rainfall monitoring tool popularised by the Australians). These two indices require rainfall only for calculation, which is obtained

[3] Launched under CARIWIN (Caribbean Water Initiative) in January 2009

[4] Caribbean drought outlooks are developed by the Caribbean Climate Outlook Forum (CariCOF) and disseminated monthly

using land station data and NCEP/NCAR reanalysis data from the National Oceanic and Atmospheric Administration, NOAA. Drought forecasts are developed by CariCOF using the SPI.

Regional Drought Monitoring

With respect to the SPI, calculations are done for a number of time intervals – 1-, 3-, 6- and 12-months. The shorter intervals give a good idea of soil moisture (agricultural drought) and the longer intervals would depict surface and ground water (Hydrological drought). SPI categories range from exceptionally wet to exceptionally dry (see Table 1).

Table 1: SPI Categories currently in use

SPI Value	Category	SPI Value	Impact
-0.50 to -0.01	Normal	0.05 to 0.01	Normal
-0.80 to -0.51	Abnormally Dry	0.80 to 0.51	Abnormally Wet
-1.30 to -0.81	Moderately Dry	1.30 to 0.81	Moderately Wet
-1.60 to -1.31	Severely Dry	1.60 to 1.31	Very Wet
-2.00 to -1.61	Extremely Dry	2.00 to 1.61	Extremely Wet
<-2.01	Exceptionally Dry	>2.01	Exceptionally Wet

Mr. Moore also showed the most recent SPI products and with such, December's SPI showing some parts of the Eastern Caribbean being predominantly dry.

With the deciles the precipitation is ranked into tens (percentiles). The classification of such is shown in Table 2. The deciles are also expressed with the same timescales.

Table 2: Decile Classifications

Decile	Category
Decile 10: (highest 10%)	Very much above average
Decile 8-9: (next highest 20%)	Above normal
Decile 4-7: (middle 40%)	Normal
Decile 2-3: (next lowest 20%)	Below normal
Decile 1: (lowest 20%)	Very much below normal

Further information on SPIs and Deciles can be obtained from the Caribbean Drought and Precipitation Monitoring Network (http://63.175.159.26/~cdpmn/cdpmn.html)

Regional Drought Forecasting

The production of the CariCOF drought outlook began in May of 2014 and is based on a 6-month SPI which is used to provide alert levels at least three months before the end of the period. The drought outlook for the hydrological year, however, is based on a 12-month coverage ending in May (the approximate end of the dry season particularly in th eastern Caribbean). Both outlooks are updated monthly. Table 3 shows the proposed alert levels and the required action(s) to be taken.

Alert Level	Meaning	Action Level
NO CONCERN	No Drought Concern	✓ **Monitor resources** ✓ Update and ratify management plans ✓ Public awareness campaigns ✓ Upgrade infrastructure
DROUGHT WATCH	Drought Possible	✓ **Keep updated** ✓ Protect resources and conserve water ✓ Implement management plans ✓ Response training ✓ Monitor and repair infrastructure
DROUGHT WARNING	Drought Evolving	✓ **Protect resource** ✓ Conserve and recycle water ✓ Implement management plans ✓ Release public service announcements ✓ Last minute infrastructural repairs and upgrades ✓ Report impacts
DROUGHT EMERGENCY	Drought of immediate concern	✓ **Release public service announcements** ✓ Implement management and response plans ✓ Enforce water restrictions and recycling ✓ Enforce resource protection ✓ Repair infrastructure ✓ Report impacts

Drought Information Needs (Jamie Paul, Barbados Water Authority)

In her presentation Jamie Paul gave some general information on the water supply of Barbados in which 86% is from ground water, 14% from surface water and of this the Barbados Water Authority (BWA) supplies over 94% of the country water needs. The country has a proactive ground water management system which:

- Monitors public wells and bore holes with water level and water quality monitoring
- Monitor changes to protect over pumping
- Manage ground water drought

She also expressed the drought information needs of the sector which included:

- Provide rainfall station coordinates with the rainfall data
- One location is reported for all rainfall data
- More data on daily precipitation values, intensity and daily temperature is needed
- Region-specific drought forecasts in the country
- More collaboration with industry stakeholders

Overview of National Drought Mitigation Center, NDMC (Mark Svoboda, NDMC)

Mr. Svoboda highlighted the mission of the NDMC, which is to lessen societal vulnerability to drought by:

1. Improving the science of drought monitoring, planning and mitigating
2. Building awareness of drought and its impacts
3. Focusing the attention of policy makers on the importance of drought policy and planning in the wise stewardship of natural resources

NDMC today:

- Directed by Dr. Mike Hayes with 16 staff members
- Decision support tools: U.S. Drought Monitor, North America Drought Management, Vegetation Drought Indices, Drought Risk Atlas, Drought Impacts Reporter
- 45 states with drought plans, 10 states with drought mitigation plans

Half of the staff of the NDMC are social scientists thus giving rise to a section which is dedicated to planning efforts. The NDMC advocates planning on all scales. Planning should begin at the local level and involve the 'locals'.

Disaster Risk Management Overview (Mark Svoboda, NDMC)

Mr. Svoboda in his presentation stated that drought is a "force of the truth" and societies will manage climate change in a way they manage droughts (for better or worse).

Analysis of drought risk management is the starting point for a comprehensive analysis. Drought is a normal part of climate and in any given year at least 15 percent of the county is expected to be in drought in the United States. Mr. Svoboda also mentioned that tree rings could also be used to look back at drought occurrences.

Mr. Svoboda also gave a definition of drought.

> *A deficiency of precipitation from the expected or "normal" that, when extended over a season or a longer period of time, is insufficient to meet the demands of human activities and the environment.*

Drought differs from other natural hazards in that it is slow in its onset and there is no universal definition.

Take away points:

- All droughts are local therefore it is optimal to monitor on all scales as well as plan at all levels
- Collaboration is key

Some Lessons Learnt:

- Crisis management discourages self-reliance and promotes dependence on government and donors
- Risk management increases self-reliance and reduces likelihood of impact
- Monitoring is the foundation of risk management planning

Drought Monitoring and Early Warning (Mark Svoboda, NDMC)

Drought monitoring and early warning involves processes such as:

- Tracking
- Assessing and reporting climate and water supply
- Assessing and reporting trends and current conditions

Currently within the United States seasonal and monthly drought outlooks are produced. Various medium and short-range forecasts (6 to 10 day and 8 to 14 day) are also made available.

Drought Indices and Indicators in Use around the World (Brian Fuchs, NDMC)

In his presentation Mr. Fuchs stated that different types of drought are based on timescales and there are indices and indicators that can be used to identify these at various thresholds.

Definitions:

Indicator:

A measure of a meteorological, hydrological, agricultural or socio-economical variable that provides an indication of potential drought related stress of deficiency.

Index:

A method of deriving "value added" information to drought by comparing current conditions to historical conditions.

Monitoring Drought Impacts (Mark Svoboda, NDMC)

Drought Impact Definition:

A drought impact is an observable loss or change that occurs at a specific place and time. It is also noted that not all impacts are negative.

Below is a list of some reasons provided by Mr. Svoboda on why we track impacts:

- Impacts are the face of drought. We need to know the baseline for monitoring….
- …So as to know where to direct relief (response)
- To help identify and reduce vulnerability in the event of another drought (mitigation)

The Standardized Precipitation Index (SPI) and Standardized Precipitation Evapotranspiration Index (SPEI) (Brian Fuchs, NDMC)

The SPI was developed in 1993 by T. B. McKee, N.J. Doesken, and J. Kleist with precipitation as the only input parameter. It is currently in operational mode in over 80 countries. The multiple timescales within the index allow for temporal flexibility in evaluation of rainfall conditions and water supply.

Mr. Fuchs mentioned that the SPEI has more strength than the SPI as it incorporates temperature as well to estimate evapotranspiration. The use of temperature to estimate evapotranspiration is thought to work better, however, when considering drought for areas outside of the tropics.

Caribbean Water Monitor (Anthony Moore, CIMH)

The Caribbean water monitor is a collaboration between CIMH and the Institute of Earth Sciences, University of Applied Sciences of Southern Switzerland (SUPSI-IST). The input into the monitor is simply rainfall data for all stations. It then calculates SPI values for each location and can be done on varying timescales. The water monitor produces graphs of the SPI for stations at different timescales, and can produce country maps of the SPI using the GIS software GRASS.

Country Presentations on Existing National Drought Policy and Plans

Participants presented information on activities in their countries related to or that can support drought risk management (that is tasks of the meteorological service any the collaborations between other sectors/agencies) and whether they have a drought policies or plans in place.

St. Vincent and the Grenadines

- Has a small meteorological office but produces rainfall outlooks on a monthly basis as part of the CariCOF process
- In the early stages of ground water monitoring
- Monitor water quality for the entire island
- Controls 14 rainfall stations and 7 water level stations
- There is a good quantity of rainfall and temperature data for stations
- There is a good back-up system
- No existing streams/rivers in the Grenadines. They depend greatly on rainfall
- The Meteorological Service has begun collaboration with the agriculture and water sectors as well as the government information service to form a committee to move forward (including the meteorological service, agriculture sector, GIS and water sector)

Jamaica

- Developed climate services for agricultural sector. This involved meeting with stakeholders, creating several climate smart related products and building awareness of weather and climate products.

- Working group made up of personnel from the meteorological and agricultural services as well as from the IRI[5]. One of their mandates was to make sure that products are delivered for all timescales.
- A network of meteorological (particularly rainfall) stations across the island
- Ensure that they are able to communicate information to farmers (especially the probabilities from the outlooks).
- Make sure forecasts are able to stand up to some measure of scrutiny.
- Use SPIs to deliver early warnings
- Information is published in their web portal (www.jamaicaclimate.net). Any indication of drought is sent to the cell phone of the farmer free of cost.
- Information is put into GIS maps for easy reading (both the observations and forecasts)
- New product released: interactive maps looking at drought at the community level

Guyana

- Extracts and distributes 75 – 80 percent of ground water for usage
- Now beginning to see saline intrusion into surface water near coastal areas
- Need to work on a collaboration with sectors
- Although Guyana is labelled as the land of many waters there is the need to look at drought and information needs to be channelled to the right persons.

Cayman Islands

- New to using SPI in monitoring and forecasting drought
- Most farmers are into irrigation and there were some drought concerns during the last dry season

Dominica

- Main function of the meteorological service is to provide hydro-meteorological information mainly for aviation.
- The CAMI[6] project has led to successful outcomes. This however, has become challenging during the last year.
- Currently rely on 2 stations for data. Efforts are on the way to obtain a wider coverage across the island.
- Provides weather information to the public. This too has been challenging
- Drought has not been an alarm although below normal rainfall has been observed during the last (and others before) season.
- Not currently utilizing SPIs for monitoring or forecasting

Grenada

- SPI calculations are done and results are shared with the Ministry of Agriculture
- With respect to drought monitoring and policy there are none in place. Talks are on-going and still awaiting results from a previous similar exercise.

[5] International Research Institute for Climate and Society
[6] Caribbean Agro-Meteorological Initiative (www.cimh.edu.bb/cami)

Belize

- Drought awareness came into play where the country faced challenges in water availability in 2012
- Currently SPI calculations are done
- No drought policies/plans in place

Potential Framework for National Drought Monitoring Networks (Adrian Trotman, CIMH)

Mr. Trotman emphasised that early warning systems are an essential ingredient for drought risk management in the Caribbean.

Why should we be concerned over drought?

- Apart from the fact that drought are part of Caribbean climate, models have predicted a drier and warmer future for the region

What has been done in the region?

- Drought and precipitation status is being monitored using indices (CDPMN)
- It is intended that the final drought and precipitation status is determined by consensus by a network of persons from different sectors, institutions and communities embracing the diversity in definitions and impacts of drought
- Short term and seasonal precipitation forecasts, including more recently drought forecasts, are produced and disseminated
- After the severe impacts of the 2009 to 2010 drought, The Caribbean Disaster Emergency Management Agency (CDEMA) included drought as a hazard to be managed in the Caribbean. A project sponsored by the Government of Brazil and piloted in Grenada, St. suggested what needs to be done at the national level to support drought monitoring and planning. Plans for Drought Early Warning Information Sytems (DEWIS) were drafted for each pilot country, with the St. Lucia plan since ratified in 2013. Aspects of the Jamaica Plan are being considered in a wider water management plan.

Caribbean Climate Impacts Database (with Rainfall Impacts Reporter, RIR) (Shelly-Ann Cox, CIMH)

The Caribbean Climate Impacts Database (CID) is being developed under the Building Capacity to Manage Water Resources and Climate Risk in the Caribbean Project, which is a partnership between the Higher Education for Development (HED) of the USA, the International Research Institute for Climate Society (IRI) and CIMH; and funded through the United States Agency for International Development (USAID). The CID houses various climate impacts on varying sectors from around the region.

Ms. Cox stated that it is important to have impacts on the ground so as to validate how severe the event was. It establishes baselines as well as supports climat impacts research that will support better risk management. Not only does the database have impacts but it also has responses for the specific event.

Information is fed into the database via various means some of which include email, direct telephone calls, twitter, facebook, media houses, and local disaster agencies.

Soil Moisture and Stream Flow Indicators (Brian Fuchs, NDMC)

Soil Moisture

In his presentation Mr. Fuchs answered several questions including what is soil moisture, why monitor and how to monitor.

What is Soil Moisture?

- Water held in the area between soil particles. As a rule-of-thumb, surface soil moisture refers to the moisture within the top 10 centimetres and root zone soil moisture refers to the moisture within the top 200 centimetres.

Why monitor?

- To assess the impacts across sectors (e.g. agriculture, water). It also provides a great indicator to the early stages or "flash" drought situations.

How to Monitor?

- Instrumentation to measure moisture content of the soil.
    - This provides accurate information and soil temperature data is also obtained.
    - Various depths can be measured in any soil
    - Mostly on automated platforms with data loggers and transmitters
- Soil moisture models and remote sensing also estimate soil moisture conditions.

Soil moisture can be used to assess/monitor drought by obtaining the soil moisture data and establishing relationships.

Stream Flow Indicators

Functions of the stream flow indicators include:

- Measuring base flow of rivers/streams
- Measuring inflow and discharge from lakes or reservoirs
- Producing drought indices
    - SWSI (Surface Water Supply Index)
    - SSI (Standardized Stream flow Index)
    - SDI (Stream flow Drought Index)
    - SWI (Standardized Water Index)

Composite Drought Index/Indicator Approach (Mark Svoboda, NDMC)

Mr. Svoboda demonstrated how indices and indicators can be combined to provide one index value/number for the decision maker. This was supported later by an exercise on calculating these combined indices that was led by Mr. Chris Poullsen.

CariCOF and its Products (Dr. Cedric Van Meerbeeck, CIMH)

The major concerns for the Caribbean region revolve around drought, crop loss, too much water and diseases. Dr. Van Meerbeeck emphasised that in the scope of disaster risk management when links are not present we need to create them (see Figure 1) and the solution is not to skip any of the links.

Figure 1: Chain Links for Risk Management

Dr. Van Meerbeeck then went on to illustrate the CariCOF-produced products that includes 3 to 6 month forecasts of rainfall and temperature, and drought outlooks of 6 monthsand one of the hydrological year using the SPI.

Assessment of Regional Drought Risk Management Plans: A Generic Approach (Dr. Lystra Fletcher-Paul, FAO[7])

FAO is a United Nation system organization with a mandate to achieve food security for all; to ensure people have regular access to enough high-quality food to lead active, healthy lives and; to raise levels of nutrition, improve agricultural productivity and better the lives of rural populations.

In the Caribbean region, Grenada, Belize, Dominican Republic, St Vincent and the Grenadines, Jamaica, Dominica and Guyana have disaster risk management plans for agriculture, most of which are yet to be approved.

Dr Fletcher-Paul stated that participation is the key method for developing drought risk management plans. It should be driven by policy makers and senior technical officers and the Ministry of Agriculture.

Appendix B outlines the process undertaken by the countries in developing their disaster risk management plans.

Lessons learnt:

- Political will is the foundation of drought management policy and plan
- Successful drought plan hinges on full integration and stakeholders' participation
    - Lack of institutional collaboration and top-down culture of decision making are hindrances
- Stakeholders should have a clear understanding of the process, know what the drought plan must accomplish, and should be supplied with adequate data to make fair and equitable decisions when formulating and writing the actual drought plan
- Integrated drought/climate monitoring is key to early warning, in parallel with a comprehensive decision support system
- Drought planning must be integrated across spatial scales (decentralization)

[7] Food and Agriculture Organization

- The plan should be viewed as a process, rather than a discrete event that produces a static document
- Process of planning is lengthy (2 years to elaborate if necessary data is not already available) and requires training, support and collaboration

There are however challenges one would face when developing a drought risk management plan for agriculture including financial challenges; inadequate capacity to conduct vulnerability assessments, administrative support, stakeholder participation and knowledge management.

In developing an agriculture drought risk management plan, Dr Fletcher-Paul recommended that (i) there needs to be a champion to drive the process, (ii) a road map needs to be developed, and (iii) stakeholder engagement is key.

Appendix A: Attendee List

	LAST NAME	FIRST NAME	COUNTRY	ORGANISATION
1	Carette-Joseph	Annie	Dominica	MET
2	Descartes	Venantius	St. Lucia	MET
3	Thomas	Joel	Grenada	NAWASA
4	Tamar	Gerard	Grenada	MET
5	John	Fitzgerald	St. Lucia	WRMA
6	Benjamin	Vincere	St. Kitts	MET
7	Neverson	Desiree	St. Vincent	MET
8	Brown	Glenroy	Jamaica	MET
9	Porter	Avalon	Cayman	MET
10	Cumberbatch	Catherine	Belize	MET
11	Aaron	Arlene	Trinidad	MET
12	Destin	Dale	Antigua	MET
13	Mitro	Sukarni	Suriname	MET
14	Yearwood	Veronica	Antigua	APUA
15	Ballantyne	Danroy	St. Vincent	CWSA
16	Canterbury	Donna	Guyana	GWI
17	Fuchs	Brian	USA	NDMC
18	Poulsen	Calvin	USA	NDMC
19	Svoboda	Mark	USA	NDMC
20	Blenman	Rosalind	Barbados	MET
21	Ifill	Alex	Barbados	BWA
22	Paul	Jaime	Barbados	BWA
23	Lovell	Tamara	Barbados	Red Cross
24	Gittens	Ricardo	Barbados	Fire Service
25	Johnson	Joyanne	Barbados	DEM
26	Forde	Octavia	Barbados	Finance
27	Savory	Veronica	Barbados	Finance
28	Jordan	Eleanor	Barbados	Tourism
29	Fletcher-Paul	Lystra	Barbados	FAO
30		Leslie	Barbados	MoA
31	Trotman	Adrian		CIMH
32	Stoute	Shontelle		CIMH
33	Kirton-Reed	Lisa		CIMH
34	Cox	Shelly-Ann		CIMH
35	van Meerbeeck	Cedric		CIMH
36	Moore	Anthony		CIMH
37	Mahon	Roche		CIMH
38	Rankine	Dale		CIMH
39	Scott	Wazita		CIMH

Appendix B: Process for Drought Risk Management Plan

Mission 1

- Establish a National Drought Risk Management (NDRM) steering committee
- Identify stakeholders
- Have intensive consultations with key stakeholders to determine the state of the Drought Risk Management (DRM)
- Identify issues of concern and vulnerability profile for key economic sectors, population groups, regions and communities
- Have an inventory of resources
- Conduct a SWOT Analysis of the Ministry of Agriculture/Agriculture sector for DRM
- Elaborate on the Strategic Framework for the agricultural DRM Plan (vision, goals, objectives, results, strategic priorities, etc.)
- Have a debriefing session with a subset of wider stakeholder groups

Mission 2

- Have a stakeholder consultation to:
    - Review the draft document
    - Begin the process of fine tuning the strategic framework
    - Elaborate the 5-year implementation plan
- Begin exhaustive, in depth discussions on institutional arrangements for implementation
    - Who will coordinate the implementation?
    - What support will be provided?
    - How will it be monitored and evaluated?

Mission 3

- Have a second stakeholder consultation; additional meeting and discussions with stakeholders to address gaps in the Plan
- Draft committee and consultation work on report in the country
- Make sure the consultant stays in contact with the stakeholders using appropriate protocol for any fine tuning
- Continuous review of the plan to ensure optimal satisfaction by relevant interest groups

Follow Up

- Technical review of the agriculture DRM Plan by FAO
- Agriculture DRM Plan returned to the Permanent Secretary and Minister for final review and clearance