CARIWIN Regional Seminar

January 14-15, 2010

Georgetown, Guyana

Event Report

1. Main objectives of the Regional Seminar:

- reinforce the principles of IWRM;
- promote leadership of CIMH, its institutional role and knowledge;
- conduct capacity-building exercise with National Partners focused on addressing needs and priorities in water management in CARIWIN's pilot communities;
- provide a forum for discussion amongst collaborators and regional, national, and community level stakeholders;
- identify needs and priorities regarding a National Water Information System and Caribbean Drought and Precipitation Monitoring Network for Guyana; and
- direct CARIWIN's potential contributions.

2. Participation:

Country	Organization	Name
Barbados	CDEMA	Ms. Nicole Alleyne
	Caribbean Institute for Meteorology and Hydrology (CIMH)	Dr. David Farrell
		Mr. Adrian Trotman
		Mr. Anthony Moore
	CERMES, UWI	Dr. Adrian Cashman
Canada	Du Chêne Watershed Organization	Ms. Sandrine Desaulniers
	McGill University	Dr. Chandra Madramootoo
		Ms. Catherine Senecal
		Ms. Marie-Claire St-Jacques
		Ms. Johanna Richards
	Ministry of Environment, Quebec	Mr. Daniel Blais
Grenada	Ministry of Agriculture, Land Use Division	Mr. Trevor Thompson
Guyana	Environmental Protection Agency	Ms. Karen Alleyne
		Mr. Colis Primo
	Guyana Rice Development Board (GRDB)	Mr. Satanand Narain
	Guyana Water Inc.	Ms. Savitri Jetoo
		Mr. Marlon Daniels
	Guysuco	Mr. Ashley Adams
		Mr. Omadat Persaud
	Hydrometeorological Service	Ms. Bhaleka Seullal
		Mr. Garvin Cummings
		Mr. Antonio Peters
		Ms. Courtney Crandon
		Ms. Abigail Edghilo
		Ms. Thaeshwari Pooran
		Ms. Rushell Keno Galloway
		Ms. Subrina Patterson
		Mr. Kelvin Samaroo
	Ministry of Agriculture	Ms. Colleen Bascom

	Ministry of Amerindian Affairs	Ms. Sharon Austin
	Ministry of Health	Dr. Ashok Sookdeo
	National Agricultural Research Institute (NARI)	Mr. Bissasar Chintamanie
	National Drainage & Irrigation Authority (NDIA)	Mr. Timothy Inniss
	St. Cuthbert's Mission	Mr. Ernest Dundas
	University of Guyana (School of Earth and Environmental Sciences)	Ms. Denise Simmons
India	India Meteorological Department, New Delhi	Dr. Y.V. Rama Rao
Jamaica	Water Resources Authority	Mr. Andreas Haiduk
St. Lucia	GEF-IWCAM	Mr. Vincent Sweeney
United States	NOAA	Ms. Angel McCoy

3. Agenda:

The full agenda is in Appendix. The content of each presentation can be viewed on the CARIWIN website. The main points of discussion are summarized below.

4. Summary of Opening Ceremony messages:

Welcome Address from Dr. David Farrell

This event is an opportunity to assess the progress made to date through the CARIWIN Project, to identify new partners and new opportunities. The Caribbean Institute for Meteorology and Hydrology has benefited from the initiatives that have been undertaken in collaboration with Grenada, Guyana and Jamaica and foresees that CARIWIN is a good launching pad for positive results in Integrated Water Resources Management (IWRM) to be disseminated throughout the region.

Welcome Address from Dr. Chandra Madramootoo

The CARIWIN partner countries present different challenges in water management which will allow us to scale-up from test cases to get a representative view at the regional scale. Our efforts must focus on supporting decision-making for IWRM; expanding access to information; ensuring reliable, accurate and timely data; engaging the political directorate to take decisions in an informed manner; consulting a broad cross-section of stakeholders; and aiming to maximize economic and social development without damaging our resources. Floods and disaster management are critical issues to address as they impact GDP, human health and productivity. Other challenges include providing quality water in rural areas; the impacts of urban expansion

and crop intensification. The solutions require a new line of thinking, not merely engineering, but inclusive of other factors such as socio-economic. Meeting these challenges will require institutional support, an investment in data collection, and broad stakeholder involvement.

Opening Speech delivered by Hon. Minister Robert M. Persaud

CARIWIN is a unique project in the region through which we can identify ways to address emerging issues of importance to strategic development. The topics of the Seminar are relevant for decision-makers and technical officers who must meet the challenges of managing water, which, is at once our main asset and our main liability. The Government of Guyana has made significant investment toward improving drinking water, irrigation and drainage, and climate change mitigation and adaptation. Linkages are crucial to overcome limitations in financial and human resources, to keep abreast of technological advancements, and to determine ways to expand collaboration on Integrated Water Resources Management. Linkages with institutions permit exchanges at the National and Regional levels to deal with the challenges before us. In view of this, the CARIWIN Regional Seminar is important.

5. Summary of messages from Community Water Strategies (CWS) session:

Catherine Senecal

CARIWIN's main goal is to increase the capacity of Caribbean countries to deliver equitable and sustainable IWRM. Activities in 2009 included establishing the Grenada National Water Information System, which has become the standard for the entire region; launch of the Caribbean Drought and Precipitation Monitoring Network with products for the Caribbean basin available from CIMH; training sessions in IWRM, hydrology and hydrometry offered to personnel from national partners as well as CIMH personnel; ongoing research in drought indices for Jamaica, Household Water Treatment System acceptance in Guyana; and the development of reference documents for the development of Community Water Strategies. Recommendations received under the Mid-term Evaluation include developing a post-graduate academic component in the Region; prioritizing the strengthening of the National Water Information Systems; and optimizing use of financial resources to support human resources capacity building.

Adrian Trotman

The Caribbean Drought and Precipitation Monitoring Network (CDPMN) hosted at CIMH aims to be the genesis of a comprehensive regional early warning system. The CDPMN is a decision-making tool. It generates information products derived from data provided by National and regional networks and National Water Information Systems. The concept, in its most basic form, is to monitor rainfall in order to primarily to identify extremes and to indicate the level of impacts so as to direct a response. Communities have a role in measuring and recording stream flow and rainfall data, as well as informing of impacts felt in domestic water supply, agricultural, and other relevant areas.

Savitri Jetoo

The slogan at Guyana Water Inc. (GWI) is "Water is Life – Please Save it". GWI places an emphasis on safe water and works with the approaches of Water Safety Plans (WSP) and the National Programmes of Action (NPA). The WSP, based on World Health Organization guidelines, embraces a holistic approach to water management while setting health-based targets. The NPA focuses on the preservation of the marine environment by identifying and assessing problems; establishing priorities; setting management objectives; identifying and evaluating select strategies; and evaluating effectiveness. With respect to the CARIWIN pilot community in Guyana, St. Cuthbert's, GWI intends to build on the catchment-to-consumer ground work done by Young and to replicate the NPA in the Mahaica watershed.

Trevor Thompson

The National Water Information System (NWIS) that Grenada has been using since 2009 is a valuable tool for organizing data; it has made it easier for users to access data and to assess the country's water resources. Outputs from the system are being used successfully to present information to Ministers during water policy review and tariff review for example, as policy-makers more readily agree when information is presented clearly. The country has benefited from having one system for all agencies, with all users accessing freely and remotely through internet access. Grenada will continue to build on the system and is open to others viewing it in order to emulate it.

Sandrine Desaulniers

The example of water management in the Province of Quebec, Canada was presented for the purpose of broadening the discussion. Since the Quebec Water Policy of 2002, water within the jurisdiction is a common resource managed by participative governance of watershed management organizations. With these organizations acting as facilitators creating partnerships through dialogue, stakeholders make decisions by consensus with Ministry representatives in advisory roles. The IWRM cycle involves envisioning the watershed in 25 years time, and developing the Master Plan in accordance.

Marie-Claire St-Jacques

A generic framework synthesizing the key elements of IWRM relevant at the community level along with tools for application was prepared as a background resource for developing Community Water Strategies. Elements of capacity building, adaptability, ownership by the community, and information exchange are essential, as well as the identification of an entry point that is both relevant and realistic in the context of each community. Potential entry points in the CARIWIN pilot communities include water supply and drinking water contamination, flood and drought mitigation, ecosystem degradation and land use practices, and governance.

5.1 Discussants:

Vincent Sweeney

There are potential linkages between the Global Environment Facility's Integrated Watershed and Coastal Areas Management (IWCAM) project and CARIWIN. CARIWIN's partner countries Grenada and Jamaica are also part of IWCAM. Current activities in Barbados for IWCAM include building an NWIS based on the work done through CARIWIN in Grenada. Possible areas for collaborating with CARIWIN in providing support to countries with respect to IWRM include: capacity building in hydrometry, GIS, lab strengthening for water quality monitoring. IWCAM also supports an informal working group in IWRM which has synergies with CARIWIN to share progress.

Nicole Alleyne

It is essential to bring disaster managers onto the program in discussing water management due to the prospect of drought and flood. The NWIS in Grenada is a great example of data sharing within the Caribbean and in the world. The CDPMN has the potential to be a useful tool in managing occurrences of drought and flood and mitigating impacts. The role of public policy is critical in providing an enabling environment for the implementation of IWRM.

Saviti Jetoo

We must look at the pilot communities and envision expansion to other communities by examining how the lessons and experience can apply, in particular, to the rest of rural Guyana. In order to facilitate and support decision-making in Guyana, we must envision a NWIS similar to the one established in Grenada and look beyond 2012 and the end of the CARIWIN project.

Dr. Adrian Cashman

Success of the NWIS in Grenada is that it has been used beyond the technical sphere to generate information in compact and presentable form, giving senior managers power to persuade policy makers. CARIWIN may continue to support IWRM in the long term by embedding lessons and programs into the institutional workings and memories around the Caribbean.

Toshao Ernest Dundas

The work of Candice Young [household water treatment systems] helped the community in St. Cuthbert's realize how important it is to treat water. I will now be able to impress how important water is to our lives and to our health. We have been taking our health for granted and we should not. We must adapt our culture and adopt some of these technologies to help us move forward. Ms. Young's work has helped to identify which of these technologies are most suitable for use in St. Cuthbert's, where ceramic filters for example are already showing much higher acceptability in the community than biosand filters or chlorine treatment systems.

5.2 National perspectives on CWS:

Foreword from Guyana

CARIWIN and Hydromet have not done enough to make community aware of benefits and to address social and cultural barriers. There is a need to inform the community about the hydrometric instrumentation installed, about the data collected, and why it is important for the community, the country and the region.

Foreword from Grenada

The NWIS in Grenada has been prioritized by the government since the importance of the work has been demonstrated. One staff member, the System Administrator, was hired on a permanent basis by the Ministry of Agriculture to ensure that the NWIS is sustainable beyond the life of the project.

Foreword from Jamaica

Jamaica is currently facing an economic crisis. The Mile Gully rain gauge from CARIWIN is in place, but installation of stream flow gauge is delayed by a stop to infrastructure construction. Training specific to IWRM can fill a need in Jamaica.

➜ The reports from the break-out sessions focusing on the prioritization of the pilot community needs; preliminary identification of key players; and the steps to implementation for each country to move forward with the CWS are in Appendix.

David Farrell

The NWIS value is that it is a decision-making platform; it has multiple levels for decision-making; it offers accessibility in a timely manner; and its format is a coherent standard for mapping for all federal agencies. The NWIS is a starting point for standardization, a positive step in the right direction. CIMH is supporting the development of the NWIS for Guyana under a JICA funded project to bring the same format and front-end as the systems existing in Grenada, Jamaica and St-Lucia. The Caribbean Development Bank has indicated willingness to fund NWIS for all CARICOM countries as soon as a proposal of costs is presented. It is a challenge for countries to manage multiple databases and structures. CIMH in its role of hosting hydrometric data for the Caribbean Region is looking to build one common framework for the Region.

The CDPMN is now accepted in the Region and the opportunity to implement it has presented itself thanks to the CARIWIN project. It will assist in short-term and long-term planning. CARICOM

water safety has many dimensions, and drought and precipitation monitoring are an important issue critical to country security.

The CWS is a useful tool in how to move forward with respect to communities and planning for water in the broader sense. CARIWIN offers an opportunity to challenge ourselves and publish on what has been learned to inform policy-makers and to export our new knowledge on water management in the Caribbean.

6. Summary of main messages from the Caribbean Drought and Precipitation Monitoring Network (CDPMN) session:

Nicole Alleyne

The Caribbean is the second-most hazard-prone region in the world. The Caribbean Environmental Disaster Management Agency (CDEMA) is working towards a Comprehensive Disaster Management (CDM) strategy. CDEMA is broadening stakeholder participation by bringing technical institutions such as CIMH into a collaborative effort. There is a paradigm shift with CDM to become more anticipatory; it is a shared responsibility from various sectors; and it is on-going. The CDPMN is a useful tool for CDM as it can strengthen Early Warning Systems. The information generated by the CDPMN will be beneficial for policy development and informed decision-making.

Adrian Trotman

The CDPMN implies a network of community, government agencies and individuals. The main motivation is to enhance the lives of people by developing indices which provide information on both extremes of precipitation, i.e. drought and flood. The information can guide responses and mitigation strategies, which may even be built into policy.

CIMH has begun the agro-climatic mapping of Guyana under the aegis of the Caribbean Agrometeorological Network (CarAgMet). CAMI, funded by the European Union in the amount of 720,000Euros, is a collaborative effort between CIMH, the World Meteorological Organization, CARDI, and the meteorological and hydrological services of ten countries in the Region, including Guyana. Work will include the organization of farmer fora and training workshops for national met services to generate better products from the met services for use by the farming and wider agricultural community.

Anthony Moore

Information products currently available from the CDPMN on the CIMH website are the Caribbean Basin Maps based on the Standard Precipitation Index (SPI) and Deciles for one, 3, 6 and 12 month intervals. To do this, rainfall data is required up to the month of the map being

generated. There is a need to bring together the various indices plus the impacts felt on the ground in order to generate one classification system.

CIMH is working in collaboration with the University of Applied Sciences and Arts of Southern Switzerland (SUPSI) to expand country-level monitors beyond CARIWIN countries.

Johanna Richards

Preliminary research results on the correlation between drought indices and soil water for three agricultural areas in Jamaica indicate that SPI has potential for use in understanding soil water during drought events in Jamaica. The study is also investigating the effects of urbanization on the Rio Nuevo sub-basin in Jamaica using the Soil and Water Assessment Tool (SWAT), as well as irrigation deficits for 3 study sites based on a drought frequency analysis. The results will contribute to the precision of the CDPMN in Jamaica.

Dr. Rama Rao

The improvement of National forecasting abilities is essential for improved disaster management. Numerical Weather Prediction models such as the Weather Research Forecasting (WRF) Model are the most appropriate approach for weather and climate prediction, and research is ongoing on the ability of the WRF to predict heavy rainfall events in Guyana.

Angel (Bennett) McCoy

The Famine Early Warning System (FEWS) produces one document (map) on a weekly basis for decision-makers at USAID to determine how best to distribute humanitarian aid. Supplemental information from field correspondents makes up for data/model voids. There is an information exchange between specialists in geography, agriculture, economy, climate and others which takes place on a weekly basis through the GoToMeeting.com teleconference. GIS tools are used to generate the map. The final product is distributed in Adobe format to an email distribution list by using the bcc function, and it is made available to all on the website www.fews.net .

The North American Drought Monitor (NADM) is a Regional monitor comprising Canada, USA, and Mexico. Each country creates the depiction of drought within their boundaries. Prior to publication, contributors and users participate in a peer review of the map which indicates drought severity and includes a severity classification table. The NADM is produced by following established procedures in a time-frame of two weeks.

6.1 Points brought forth during the plenary discussion:

- Some Met services in the Caribbean Region use GEOS imagery, though could be used more to the benefit of the Region.
- Use of indigenous knowledge is a valid source of information to assist in flood and drought prediction.

- The state of vegetation can be an indicator for drought; what is required are the persons to provide this information, and therefore the question is how to get these mechanisms in place – a protocol must be established.
- A description of the calculated or derived indices of drought must be translated into real terms so that these are meaningful beyond the scientific community – and it is the correlation between the indices and their meaning with regards to impacts felt which provides the real value in planning response.
- National level drought monitors allow for inclusion of many impacts, but to ensure relevance of work, the questions of "what is the product to be used for?" and "who is the user of the monitor and its outputs?" must be addressed at the outset.
- Precipitation or the lack thereof, is a major issue in small Caribbean countries for those depending on rain water harvesting for their domestic water supply, for example. The forecasts provided by CIMH are often ignored, the community is not advised, no actions are taken to prevent facing shortages. An important question to address in the implementation of a national monitor is "how is the information to be communicated to the people/sectors who will suffer the impacts?"
- In Guyana, there is insufficient rainfall monitoring across the country due to the largely uninhabited interior and to the difficulty of recruiting volunteers to monitor stations. Guyana Hydromet Service must develop a strategy for determining the optimum placement of rain gauges to avoid a scattered approach which may lead to meaningless data. Automated stations, though costly, should be considered for inland areas.
- CDEMA currently has a project in the Region investigating the use of NOAA satellite data for flood prediction. CIMH is a collaborator and will investigate how to use the outputs from this to the benefit of the CDPMN.

6.2 Panel Discussion: Need for improved drought and precipitation information for Guyana:

Representative from Guyana Hydromet Service

It is a positive step to include stakeholders in the development of information products. This will ensure that the products are relevant to the stakeholders and make them more acceptable to the stakeholder group.

Hydromet is very supportive of this initiative. It will transform data into information for policy-makers; it will enhance the ability of national met services to be relevant and useful in order to capture the attention of policy makers; it will allow national met services and CIMH to have a

stronger mandate than simply data archiving; it will create leverage in order to build more with the feedback from policy-makers.

Representative from NARI

A system allowing all agencies to share information and allowing for feedback to farmers is useful. A product similar to that provided in India would be useful, where the appropriate agro response is built in to the forecast. In Guyana, more data is needed.

Representative from Guysuco

This is a very relevant initiative, particularly as an agricultural entity feeling the impacts of the current dry spell. Guysuco has undertaken regular data collection since 1956 from a wide network of gauges. There are presently six new real-time monitoring stations. There is an urgent need for a drought/flood early warning system in Guyana.

Representative from NDIA

NDIA is responsible for the maintenance of the network of drains. The relevance of the CDPMN in Guyana is evident for NDIA in its usefulness for the improved management of the conservancies.

Representative from GWI

A system similar to the NADM for Guyana is perhaps too ambitious at this time and can only be as good as its data. The role of CARIWIN in developing drought indices; systems to facilitate data collection; and information on the status of the resource all represent reasonable objectives. The CDPMN can add value, but will the relevant agencies in Guyana be able to contribute?

6.3 Points brought forth during the plenary discussion:

- Involvement of schools and local authorities to expand the network of monitoring stations in Guyana was suggested; however Hydromet has already experimented with this and the irregular schedule of schools over holidays and weekends makes regular monitoring problematic. Further options for public involvement can be explored, such as weekly reports as opposed to daily monitoring.
- A drought plan is very useful for a country to become more anticipatory and less reactive. In Guyana, the Civil Defense Commission should be included in this plan development.
- The drought monitor in the USA started small. Guyana can start small and build toward the future.
- The experience in Grenada demonstrated that although little data was believed to be available, the process of building the NWIS increased inter-agency cooperation and

multiple users came forward with additional data. Furthermore, the NWIS has become a source of income generation for the Ministry of Agriculture as it sells the maps it generates to developers and private companies.

- The Guyana Ministry of Agriculture wants to take the CDPMN forward and work collaboratively with the Ministry of Amerindian Affairs, Ministry of Health, the Environmental protection Agency, the University of Guyana and others.
- The FEWS NET is willing to work together with the CDPMN in developing a monitor for Guyana.

7. Closing comments:

Dr. David Farrell

There are several excellent collaborations coming out of this event, in particular synergies between the CARIWIN and CAMI projects. Given that CARIWIN is in line with many of the policies and issues facing the Region, other Regional institutions are encouraged to play a more active role in CARIWIN in order to expand the group of active stakeholders and collaborators. An academic component brought into CARIWIN will assist in solving some of the developmental problems at hand.

Dr. Chandra Madramootoo

IWRM is unequivocally a worthwhile goal. The purpose of the event was to sensitize stakeholders and for each to determine how to apply this in their own spheres. That is the benefit of CARIWIN as a facilitator towards IWRM. It was agreed that there is a need to include more stakeholders; a need for more data; that there are many challenges; that there are limited budgets; and that there are valid competing demands. However, delegates have been sensitized to the direction of work, the roles of stakeholders and the possibilities for development over the long-term. The CARIWIN Regional Seminar achieved its goal in that respect.

CARIWIN has an interest in capacity-building in the Region in collaboration with partners such as UG, UWI and the GEF-IWCAM project in order to deliver a targeted training program to meet a specific development need. CARIWIN is looking to deliver something innovative and to take this to a level not seen before in the Caribbean.

APPENDIX I: AGENDA

Day 1: Community Water Strategies (CWS)		
Time	**Topic**	**Speaker**
8:30-9:00	**Opening Ceremony**	
	Welcome remarks	Dr. Chandra Madramootoo/Dr. David Farrell
	Opening speech	Hon. Robert M. Persaud, Minister of Agriculture, Guyana
9:00-9:05 Break		
9:05-9:20	CARIWIN project update	Ms. Catherine Senecal, McGill University
9:20-9:40	The Caribbean Drought and Precipitation Monitoring Network	Mr. Adrian Trotman, CIMH
9:40-10:00	Water Safety Plans/National Programme of Action in the context of communities	Ms. Savitri Jetoo, Guyana Water Inc.
10:00-10:20 Break		
10:20-10:40	The National Water Information System: potential at the local level	Mr. Trevor Thompson, Ministry of Agriculture, Grenada
10:40-11:00	Experiences in watershed management and stakeholder engagement	Ms. Sandrine Desaulniers, CDUC
11:00-11:20	Objectives and approaches for Community Water Strategies	Ms. Marie-Claire St-Jacques, McGill University
11:20-12:00	*Discussants*: Ms. Nicole Alleyne, Ms. Savitri Jetoo, Dr. Adrian Cashman followed by a plenary discussion moderated by Mr. Vincent Sweeney	
12:00-1:00 Lunch		
1:00-1:45	Panel discussion: national perspectives on CWS, moderated by Mr. Vincent Sweeney	Mr. Ernest Dundas – St. Cuthbert's Mission Mr. Trevor Thompson – Grenada Mr. Garvin Cummings – Guyana Mr. Andreas Haiduk – Jamaica
1:45-2:45	3 break-out sessions to discuss priorities, key players and steps to implementation for each pilot	Led by Mr. Trevor Thompson, Mr. Garvin Cummings and Mr. Andreas Haiduk
2:45-3:00 Break		
3:00-4:15	Verbal report of the main outcomes from the 3 break-out sessions followed by a plenary discussion, moderated by Dr. Adrian Cashman	
4:15- 4:30	Closing comments	Dr. David Farrell, CIMH

Day 2: Caribbean Drought and Precipitation Monitoring Network (CDPMN)		
Time	**Topic**	**Speaker**
8:30-9:00	Welcome and Day 2 objectives with CDPMN overview	Mr. Adrian Trotman, CIMH
9:00-9:20	CDPMN and Comprehensive Disaster Management	Ms. Nicole Alleyne, CDEMA
9:20-9:40	CDPMN: enhancing existing drought and flood plans	Mr. Adrian Trotman, CIMH
9:40-10:10	Regional monitoring and forecasting under the CDPMN	Mr. Anthony Moore, CIMH
10:00-10:20 Break		
10:20-10:40	CARIWIN Jamaica: current and future research	Ms. Johanna Richards, McGill University
10:40-11:00	The Weather Research and Forecasting (WRF) Model	Dr. Y.V. Rama Rao, India Meteorological Department
11:00-11:20	The benefits and the development of an early warning system	Ms. Angel McCoy, NOAA
11:20-12:00	Plenary discussion	Moderated by Mr. Adrian Trotman, CIMH
12:00-1:00 Lunch		
1:00-1:20	National Monitoring-SUPSI collaboration	Mr. Anthony Moore, CIMH
1:20-1:40	Creating the North American Drought Monitor	Ms. Angel McCoy, NOAA
1:40-2:00	National Monitor of Guyana: role and approach	Mr. Adrian Trotman, CIMH
2:00-2:40	Panel discussion: Need for improved drought and precipitation information for Guyana *Panelists: Representatives from Hydromet Service, NARI, Guysuco, NDIA, Guyana Water Inc.*	
2:40-3:00 Break		
3:00-4:00	Plenary discussion: Developing a National drought and precipitation monitor for Guyana – The way forward	Moderated by Mr. Adrian Trotman, CIMH
4:00-4:30	Concluding remarks	Dr. David Farrell, CIMH Dr. Chandra Madramootoo, McGill University

APPENDIX II: BREAK-OUT SESSION REPORTS

GRENADA. *Group comprised 10 participants from Grenada, Guyana and IWCAM Representative. Led by: Trevor Thompson*

OBJECTIVES	OUTCOMES
1) Prioritisation of the pilot community's needs	**Identification of priorities:** Target areas identified in the CWS Document are relevant. Some missing issues include: 1. Public Awareness 2. Community Group and Sectoral Cooperation 3. Governance Structure **Resources needed for strengthened water management:** 1. Human resources/capacity building 2. Finance 3. Baseline conditions of the watershed to be established 4. Water quality monitoring and analysis – equipment needed (collaboration with IWCAM to increase stream gauging and water quality equipment) Efforts should be focused on awareness and training, monitoring, community group dynamics, and field testing equipment
2) Preliminary identification of key players	**Roles and responsibilities of key players:** 1. Flood Forecasting by community – more involvement of community in forecasting plans for early warning systems (collaboration with JICA) 2. Data collection by community after training 3. Stakeholder involvement in watershed management 4. Ministry of Agriculture: NWIS can provide data, quality checks, training, policy and legislation development 5. NAWASA: quality analysis, data collection 6. NGOs: involvement in establishment of community groups. awareness and training 7. Private Sector: participation in management/governance, financial input, Public Private Partnership 8. St. George's University (SGU): research in water quality and on the storage systems being used

	especially if RWH is done **Resources Provision:** IWCAM, CARIWIN, Government of Grenada, University, Private Sector, International Funding Agencies, Regional Funding Agencies **What is needed to get the necessary commitment from the different players?** 1. Establishment of a governance structure for water management, leading body 2. Increased awareness of linkages between water resources management and livelihoods at the community level 3. Increased awareness of negative/positive impacts on human health, environment, etc. 4. Use of data to inform policy makers 5. NGO: responsibility for disaster management training and for implementation of certain specific components of the project
3) Steps to implementation	**Steps required to address priorities:** 1. Increased monitoring and data collection 2. Education: training, capacity building 3. Expansion of the NWIS 4. Rapid assessment/Survey of sanitation systems etc being used 5. Survey of Agrochemicals being used 6. Assessment of Environmental issues affecting the watershed 7. Water use/Supply Demand assessment **How can CARIWIN achievements to date be strengthened to meet the identified needs?** 1. Increase the number of variables being monitored under the NWIS 2. Comprehensive assessment of watershed to establish baselines 3. Identification of challenges existing within the watershed from a social perspective 4. Use of data to inform farming, recreation, and commercial activities

GUYANA. *Group comprised 15 participants from Guyana and Canada. Led by: Garvin Cummings*

OBJECTIVES	OUTCOMES
1) Prioritisation of the pilot community's needs	**Identification of priorities:** All target areas identified in the CWS Document are relevant. Missing issues include environmental management plan and climate change adaptation. **Resources needed for strengthened water management:** 1. Understanding of the quantity and quality of available water 2. Capacity building 3. Financial resources 4. Overcoming social and cultural barriers
2) Preliminary identification of key players	**Identification of key players to involve:** National Climate Unit University of Guyana: research and development, capacity building Civil Defense Commission: disaster management Involvement of other NGOs (e.g. WWF fresh water resources projects) **What is needed to get the necessary commitment from the different players?** University of Guyana: alignment with ongoing research Government: linkages between water resources management and economic benefits
3) Steps to implementation	**Steps required to address priorities:** 1. Enforcement of existing legislation 2. Clearly established roles for each stakeholder **How can CARIWIN achievements to date be strengthened to meet the identified needs?** 1. Engage universities in training personnel from the Region 2. Incorporation of CWS in National Development Framework 3. More local community involvement in developing project ideas and documents

JAMAICA. *Group comprised 8 participants from Jamaica, Canada, Guyana, CDEMA and NOAA. Led by: Andreas Haiduk*

OBJECTIVES	OUTCOMES
1) Prioritisation of the pilot community's needs	**Identification of priorities:** Not all areas identified in the CWS Document are relevant to Mile Gully, in particular flooding and drought. Priorities include: 1. Complete the water supply infrastructure under the Rural Water Programme 2. Complete the installation of streamflow gauge 3. Training in IWRM for a wider range of government departments (e.g. Ministry of Health, Ministry of Agriculture) 4. Allocation of the water supply to different uses within Mile Gully (domestic vs. agricultural) 5. Training on adequate and feasible wastewater systems **Resources needed for strengthened water management:** 1. Financial resources to complete infrastructure 2. IWRM training 3. Involvement of entities with a social focus in addition to a scientific or technical one to champion training elements
2) Preliminary identification of key players	**Roles and responsibilities of key players:** 1. Ministry of Water: resolve allocation issues 2. RWSL to look into submitting a proposal to the Caribbean Development Bank's Basic Needs Trust Fund in order to finance the completion of infrastructure in Mile Gully 3. CARIWIN to provide IWRM training for national government 4. NGO – government partnership suggested for action at the community level, where NGO can champion the process, with support from government **What is needed to get the necessary commitment from the different players?** 1. Completion of infrastructure is needed to maintain interest by the community (project initiated in 2002) 2. Benevolent Societies need persons with social background to champion process, convene stakeholders and move process forward

3) Steps to implementation	**How can CARIWIN achievements to date be strengthened to meet the identified needs?** 1. CARIWIN training to be provided to national government within the next 6 months. Potential settings for training events include: a) National IWRM Symposium to be held February 24-25th, 2010 in Jamaica b) Caribbean Environmental Forum to be held June 21-25th, 2010 in Montego Bay, Jamaica 2. NWIS has been functional for 2 years, but an upgrade based on the Grenada NWIS would be beneficial (e.g. Google Earth feature)