Caribbean Water Initiative (CARIWIN)
Project number S61268-583
McGill University
Caribbean Institute for Meteorology and Hydrology

CARIWIN Annual Progress Report for the period April 1, 2007 to March 31, 2008

Prepared jointly by McGill University and CIMH

Presented to AUCC, UPCD Tier 2 Program

May 31, 2008

List of acronyms

AUCC – Association of Universities and Colleges of Canada
CAFRA – Caribbean Institute for Feminist Research and Action
CARDI – Caribbean Agricultural Research and Development Institute
CARICOM – Caribbean Commonwealth
CARIWAND – Caribbean Water and Gender Network
CARIWIN – Caribbean Water Initiative
CDPMN – Caribbean Drought and Precipitation Monitoring Network
CEHI – Caribbean Environmental Health Institute
CI – Canadian Institution
CIDA – Canadian International Development Agency
CIMH – Caribbean Institute of Meteorology and Hydrology
CWS – Community Water Strategies
DCETO – Developing Country Educational and Training Organization
FAO – Food and Agriculture Organization of the United Nations
GE – Gender Equality
GIS – Geographic Information System
GWA – Gender and Water Alliance
IWRM – Integrated Water Resources Management
LFA – Logical Framework Analysis
RBM – Results Based Management
UPCD – University Partnerships in Cooperation and Development
UWI – University of the West Indies
WIS – Water Information System
WRA – Water Resources Authority of Jamaica

1) Project profile

Lead Canadian partner	Lead developing country partner
McGill University **Canadian project director:** Dr. Chandra Madramootoo, Dean, Faculty of Agricultural and Environmental Sciences Phone number: (514) 398-7707 E-mail address: chandra.madramootoo@mcgill.ca	**Caribbean Institute for Meteorology and Hydrology, Barbados** **Developing country project director:** Dr. David Farrell, Principal Phone number: 011-246-425-1362 E-mail address: dfarrell@cimh.edu.bb

Other partners
Ministry of Agriculture (Grenada)
Ministry of Agriculture (Guyana)
Water Resources Authority (Jamaica)

Link to regional and national development priorities
Difficult access to water contributes significantly to the risks people face in caring for their families and ensuring their livelihoods. The Caribbean Disaster Emergency Response Agency notes that the past catastrophic effects of hurricanes and floods were compounded by a lack of hydrologic data, a shortage of skilled water resources specialists, and inadequate institutional capacity in Commonwealth Caribbean (CARICOM) countries. To help governments ensure sustainable development and alleviate poverty, the project will help establish an integrated, participatory, gender-sensitive and environmentally sound approach to the management of water resources at the national and community levels in Jamaica, Grenada and Guyana. The project also addresses the regional priority of strengthening the regional integration process, through the upgrading of a regional training and technical services institution (CIMH), and ensuring the environmental sustainability of the Caribbean region.

Project purpose
The purpose of the project is to refine the training and analytical capacity of the Caribbean Institute for Meteorology and Hydrology (CIMH) as it pertains to the management of water resources. The Institute will train leaders capable of managing water resources in an economically productive, socially acceptable and environmentally sustainable manner while meeting the needs of all stakeholders, particularly the most vulnerable.

Expected outcomes
The main expected outcomes include: the emergence of CIMH as a strengthened regional training institution and information centre of excellence in equitable and sustainable integrated water resources management (IWRM); an increase in the number of skilled water specialists and decision-makers who are qualified to develop IWRM policies in Jamaica, Grenada and Guyana; the establishment of partnerships among national agencies and community water users

associations to adopt these standard practices to address the needs of the poor and reinforce women's participation at all levels of planning and decision-making.

Beneficiaries
The main beneficiaries include national and local government authorities, national women's affairs departments, staff, faculty members and students from the collaborating institutions, water specialists, farmers, community water user groups, ethnic minorities and other marginalized groups from the targeted regions.

Key activities
Key project activities include the development of IWRM programs and the training of national policy-makers, senior water specialists and technicians; the implementation of a computer hardware and software data system used for the analysis and presentation of water data; and the development of a community water strategy governance model in each country that will be documented and disseminated to other CARICOM member states through workshops and publications.

Key results to date
CARIWIN has provided training to CIMH personnel in principles of IWRM as well as improvements to the CIMH library and laboratory which have strengthened the capacity of CIMH as a training and information centre. The delivery of educational programming at CIMH has expanded to include IWRM. CIMH personnel have successfully co-delivered three targeted IWRM short-courses in collaboration with McGill to key representatives from the three CARIWIN partner countries. The purchase of water quality testing equipment for CIMH and the partner countries has enhanced the training and research infrastructure by providing a means of data collection which was previously unavailable. The institution is already emerging as a regional reference in IWRM. CARIWIN research in Barbados has resulted in a report on water, gender and equality in water management. To date, 58 project documents related to best practices in IWRM have been made available on the CARIWIN website. Project results and learning were disseminated regionally at the 7th Caribbean Islands Water Resources Congress.

CIDA priorities addressed

Official development assistance area(s):
Water and sanitation (primary)
Environmental conservation (secondary)

Sector(s):
Water resources policy and administrative management (primary)
Education and training in water supply and sanitation (secondary)

Policy priorities:
Environmental sustainability (primary)

Project value
Original CIDA commitment: $1,000,000
Partners' commitments: $1,293,000

Project duration
October 2006 - July 2012

2) Key team members and stakeholders

Name	Institution	Project Role
Dr. Chandra Madramootoo	McGill, Dean of Faculty of Agricultural and Environmental Sciences	CI Project Director
Dr. Edward McKyes	McGill Professor in Water Resources	Internal Advisory Committee for CARIWIN
Dr. Van-Thanh-Van Nguyen	McGill Professor in Water Management	Internal Advisory Committee for CARIWIN
Ms. Catherine Senecal	McGill Professional Associate	CI Project Coordinator, Gender Specialist
Mr. Apurva Gollamudi	McGill Professional Associate	Water Institutions and Hydrology Specialist
Mr. Peter Enright	McGill Research Associate and Faculty Lecturer	Water Information Systems Specialist
Ms. Bano Mehdi	McGill Professional Associate	Hydrology, Climate Change, Environmental Specialist
Ms. Alicia Suchorski	McGill Graduate Student	Community Governance and IWRM, Gender Equality and Community Water Strategies
Dr. David Farrell	CIMH Principal	DCETO Project Director
Mr. Kailas Narayan	CIMH Chief Hydrologist	DCETO Project Coordinator, Hydrologist and IWRM Specialist
Ms. Kathy-Ann Caesar	CIMH Meteorologist	Gender Equality Programming and Coordination
Mr. Adrian Trotman	CIMH Chief of Meteorology and Climatology	Computer Modeller and Data Management Specialist
Mr. Shawn Boyce	CIMH Hydrologist	Trainer
Ms. Kim Whitehall	CIMH Climatologist	Trainer
Ms Judy Padmore	CIMH Technical Officer	Logistics Specialist
Ms. Adalene Ifill	CIMH Technical Officer	GE Focal Point
Ms. Linette Vassells	UWI Gender Studies Centre	Regional Gender Equality Specialist and GWA Liaison
Ms. Nelcia Robinson	CAFRA Coordinator	Participatory and community development and GE
Mr. Herbert Thomas	Jamaica WRA Director	Jamaica Coordinator
Mr. Trevor Thompson	Grenada Land and Water Division Director, Ministry of Agriculture	Grenada Coordinator
Mr. Dilip Jaigopaul	Guyana Hydrometeorological Service Director	Guyana Coordinator

3) Status of results template

UPCD Tier 2 annual progress report
Status of results

Reporting period September 19, 2006 to March 31, 2007	**Canadian lead institution** McGill University	**Country** Grenada, Guyana, Jamaica, Barbados
Project number S61268-583	**Project title** Caribbean Water Initiative (CARIWIN)	

Intended results	**Indicators**	**Cumulative outcome and outputs achieved (use indicators)**
Outcome 1 **Emergence of CIMH as a strengthened regional training institution and information centre of excellence in equitable and sustainable IWRM.**	**Outcome indicators 1** **1a. % and # (M/F) of trainees at CIMH before/after project.** **1b. Level of satisfaction among CIMH member states for services and resources.**	CIMH's role in CARIWIN has already strengthened its capacity as a training and information centre and CIMH is emerging as a regional reference in IWRM. Partner country participants have expressed high levels of satisfaction after attending training sessions.
Output 1.1 Ten (7 M / 3 F) CIMH faculty prepared to deliver training for different levels of water management stakeholders in IWRM policies and practices that address gender equality, cultural diversity, environmental sustainability and participatory approaches by Year 1(2007).	Output indicators 1.1 Number of CIMH faculty (M/F) trained in Barbados and in Canada. Evidence of appropriate attention to social/cultural/gender, economic, political, legal, environmental, technical aspects of water sector management in training	1.1 Eight (4 M / 4 F) faculty were trained. Delivery of educational programming at CIMH has expanded to include IWRM. New curricula and training materials were developed for 3 short courses on IWRM. CIMH is now providing essential training to government representatives from its member countries.
Output 1.2 One new nine-month IWRM certificate program to be offered by CIMH developed by Year 1 (2007).	Output indicators 1.2 Approval for certificate by CIMH Board of Directors. Start date of courses offered.	1.2 This will not be implemented. The intended certificate program has become redundant since the UWI Cave Hill Campus in Barbados launched a Specialisation option in Water Resources Management which

		includes learning in IWRM. CIMH and UWI are collaborating in the delivery of this new program. The CARIWIN DC Project Director Dr. David Farrell and the CARIWIN DC Project Coordinator Mr. Kailas Narayan are lecturers in this program. Professor Cashman of UWI has incorporated information on IWRM and GE from CARIWIN into the course material.
Output 1.3 Upgraded information systems (six software packages) and library resources (60 new books) for IWRM learning at CIMH by Year 6 (2012).	Output indicators 1.3 Number of new software packages and number of new books. Staff feedback on upgrades.	1.3 Twenty-three text books were purchased, with titles related to hydrology and the environmental aspects of water management.. Water quality monitoring equipment was purchased for the hydrology laboratory. These upgrades are serving as teaching resources and they have enhanced the research infrastructure by providing a means of data collection which was previously unavailable.
Output 1.4 Synergies created with 4 regional water stakeholders by Year 2 (2008).	Output indicators 1.4 1.4 Number and importance of regional stakeholders collaborating with CIMH	1.4 Two regional stakeholder of major importance (FAO Caribbean and UWI) have synergies with CARIWIN. FAO is collaborating on the development and implementation of the WIS for Grenada. UWI is collaborating in the delivery of IWRM training to national partners.
Outcome 2 **CIMH national outreach program provides water specialists and decision-makers with tools for developing IWRM policies in three DC's (Grenada, Guyana, Jamaica) by Year 6 (2012).**	**Outcome indicators 2** **2a. Number of DC's benefiting from outreach.** **2b. Number of CIMH faculty (M/F) providing outreach services in IWRM.**	All three partner DC's have benefited from CIMH's outreach by having representatives receive IWRM training. CIMH faculty providing training thus far include Dr. Farrell, Mr. Narayan, Ms. Caesar, and Ms. Padmore.
Output 2.1 National water sector data systems in three DC's made compatible with IWRM principles by Year 4 (2010).	Output indicators 2.1 Number of countries with updated systems. Evidence of changes in the content and timeliness of water sector reporting in line with IWRM principles.	2.1 Water quality monitoring and hydrometric equipment was purchased for the three countries.

		Training was provided for the collection of water quality data. Training will be provided in 2008 for the collection of water level data upon installation of the equipment. A consultant was hired to develop a database for the management of water information in Grenada.
Output 2.2 Twelve (8 M / 4 F) specialists and six (5 M/ 1 F) decision-makers from three DC's trained in IWRM by CIMH in collaboration with Canadian partners in each Year 1 and Year 2 (2007 and 2008).	Output indicators 2.2 Number of specialists (M/F) trained. Number of decision-makers (M/F) trained.	2.2 Thirty-eight specialists (26 M / 13 F) and seven decision-makers (7 M / 0 F) from three DC's received intensive training in IWRM.and subsequently reported feeling more prepared to manage the water resource in their countries.
Output 2.3 Models, best practices and learning from pilot initiatives in three DC's are documented and shared by Year 6 (2012).	Output indicators 2.3 Number of documents developed and disseminated.	2.3 Two reports were written, titled "A Summary of IWRM and Its Potential in the Caribbean" and "Water, Gender, Development; Towards equity in the management of water resources in Barbados and the Caribbean". The latter is based on a survey of communities in Barbados. Fifty-eight documents and presentations from CARIWIN training sessions are made available on the website.
Outcome 3 **Partnerships between CIMH, national agencies, local government and community water-users associations to develop three Community Water Strategies (CWS) based on IWRM principles formed in three countries by Year 4 (2010).**	**Outcome indicators 3** **3a. Number of countries where pilot partnerships have been established.** **3b. Number of CWS developed.**	Through CARIWIN activities, CIMH has begun building these partnerships. They are centered on the pilot communities in each of the three partner DC's.
Output 3.1 Upon completion of the CWS planning process, national workshops attended by five representatives from national government, five from local government and five from NGO's held in three countries by Year 4 (2010).	Output indicators 3.1 Number of workshops held. Number of participants (M/F) per country sorted by representation.	The CWS planning process is not complete, although meetings have been held with the pilot communities and the national partner government agencies to discuss the CARIWIN initiative and their role.

Output 3.2 Local workshops attended by two representatives from national government, three from local government, five from NGO, ten from WUA, five from FHH held in three communities by Year 6 (2012).	Output indicators 3.2 Number of workshops held. Number of participants (M/F) per community sorted by representation.	There are no results to report on local workshops to date.
Output 3.3 Caribbean Water and Gender Network CARIWAND is operational and influencing participation of women (50% F WUA, 30% F specialists, 15% F decision-makers) in IWRM activities by Year 6 (2012).	Output indicators 3.3 Percentage increase in female participation from Year 1 to Year 6.	There are no results to report on CARIWAND to date. The CI Project Coordinator is traveling to the region in mid-2008 and will meet with the GE focal point at that time.
Additional results	**Indicators**	**Cumulative outcome and outputs achieved (use indicators)**
Output 1.5 Regional web-based drought and precipitation monitoring network hosted by CIMH operational by Year 5 (2011).	Output indicators 1.5 Number of training sessions incorporating drought monitoring. Number of countries model validated for. Number of stakeholders in network.	1.5 The Advanced IWRM course incorporated two days of sessions on climate change and drought monitoring.
Output 3.4 Baseline information on GE in domestic water use generated for the three pilot communities by Year 3 (2009).	Output indicator 3.4 Number of communities which information generated for.	3.4 Research was conducted with communities in Barbados. The methodology was refined and preparations are underway to replicate survey in pilot communities in Jamaica and Guyana.

4) Analysis of project results

Project context

There are no developments currently affecting the project.

Annual results

The table below contains a summary of the key activities carried out during the reporting period.

Key Activities	Location	Date	Results
Delivery of GE Training and Strategy Development Workshop	Ottawa	May 24-25, 2007	Trained 1 CIMH personnel in gender issues in water management.
Delivery of Senior Administrators Workshop (3-day training)	CIMH	May 29-June 1, 2007	Trained 7 Senior Administrators from partner countries and 5 CIMH personnel in IWRM
Upgrade CIMH library	McGill	May 2007	Purchased 23 textbooks on hydrology and IWRM
Delivery of Principles of IWRM Course	Saskatoon, Southern Ontario, McGill	June 24- July 6, 2007	Trained 2 CIMH staff in IWRM
Development of training programs	McGill/CIMH	June, July, August 2007	Production of outline and material for Advanced IWRM Course (Senior Level) and for Practical Training Course (Technicians)
Develop gender equality strategy	McGill/CIMH	August 2007	Production of CARIWIN GE Strategy
Upgrade CIMH laboratories	McGill	August 2007	Purchased a multi-parameter water quality system for CIMH (personnel trained in its use during the Advanced IWRM Course)
Purchase equipment to improve National water sector data systems in three DC's	McGill	August 2007	Purchased a multi-parameter water quality system for each Grenada, Guyana and Jamaica (water managers and technicians trained in its use during the Advanced IWRM Course and the Practical Training Course)
Delivery of Advanced IWRM Course (15-day training)	CIMH	September 17-28, 2007	Trained 14 water managers from the three DC's and 3 CIMH personnel in IWRM
Incorporate drought monitoring into training	CIMH	September 26-27, 2007	Two days of sessions on climate change and drought management presented during the Advanced IWRM Course
New component of CARIWIN adopted	CIMH	September 2007	Adoption of the launching of a Caribbean Drought and Precipitation Monitoring Network (CDPMN) as a new intended output for CARIWIN

Delivery of Practical Training Course (15-day training)	Guyana	October 1-12, 2007	Trained 24 technical personnel from the three DC's and 1 CIMH personnel in hydrometeorology and water quality
Publish and present at regional conference	US Virgin Islands	October 26-27, 2007	Project information disseminated to water managers at the 7th Caribbean Islands Water Resources Congress
Research GE issues in water management	McGill (Bellairs Research Institute, Barbados)	September to December 2007	Community surveys conducted in Barbados to determine GE issues in domestic water management.
Document learning and best practices	McGill (Bellairs Research Institute, Barbados)	December 2007	Production of report titled "Water, Gender and Development; Towards Equity in the Management of Water Resources in Barbados and the Caribbean"
Document learning and best practices	McGill	continuous	58 project documents related to best practices in IWRM made available on the website
National learning and planning workshops	Grenada and Jamaica	January, February 2008	Identification of short term national priorities; Identification of local leaders; Confirmation of pilot community participation during visit from CI Project Director
Meetings with Regional stakeholders	Barbados	January, February 2008	Generation of support at CIDA for CARIWIN initiatives in water and gender issues; Leverage of funds and collaboration with FAO in development of WIS for Grenada
JPSC meetings	Barbados, Grenada, Jamaica	May 2007, January 2008, February 2008	MOU for partner country participation
Project Team meetings	McGill	April, June, July, September, October 2007; February, April 7, 2008	Activity planning; financial and progress monitoring
Purchase hardware	McGill	March 2008	Purchase of hydrometric equipment for each of the partner countries to be installed at the pilot sites in 2008
Develop software for data systems	McGill	March 2008	Signature of contract with experienced consultant for the development of WIS for Grenada
Project monitoring	McGill	March 4, 2008	Meeting with AUCC Project Officer; identification of challenges and solutions; presentation of website
Project monitoring	McGill	March 31, 2008	Completion of UPCD survey

Publish newsletter articles	McGill	Spring 2007; November 2007; March 2008	"CARIWIN – Caribbean Water Initiative" InFocus, Spring 2007; "Lessons from Caribbean Rivers" McGill Reporter, November 2007 ; "Gender and water scarcity" McGill Reporter, March 2008
Maintain CARIWIN website	McGill	continuous	Promotion of CARIWIN with comprehensive project details and 58 IWRM documents available

A Gender Equality Training Session and Strategy Development Workshop were held in Gatineau, Canada on May 24-25, 2007. The session was led by an international consultant on gender and water issues in development for CIMH GE focal point Kathy-Ann Caesar and McGill graduate student and GE researcher Alicia Suchorski. The session resulted in the two participants gaining competence in evaluating the importance and challenges of GE in water management projects; the particularities of GE issues in the Caribbean; and the design of a GE strategy for CARIWIN. In addition, the representatives attended the conference Collaborating in Africa: New Approaches in the Water Sector. In particular, the workshop on New Perspectives Regarding the Role of Women in Drinking Water Supply and Hygiene in Rural and Semi-urban Areas was attended to glean applicable lessons learned. Suchorski and Caesar set the preliminary outline for the CARIWIN GE strategy document. CARIWIN now has a working document for its GE strategy (see document introduction in Appendix). The level of openness to discuss gender issues at CIMH and sponsored events has increased. Resources and opportunities to support GE education have been strengthened at CIMH. Two workshops held at CIMH during this reporting period included a GE component and ensuing open discussions facilitated by Caesar. These results build toward Outcome 1.

Baseline studies to determine the status of GE in domestic water management were undertaken by Suchorski in three parishes of Barbados between September and December of 2007. The survey and methodology refined in Barbados will be replicated in the three CARIWIN pilot communities. So far, a report titled "Water, Gender and Development; Towards Equity in the Management of Water Resources in Barbados and the Caribbean" was written (see the table of contents and executive summary in Appendix). The generation of baseline information on GE in domestic water use for the three pilot communities is a new output for CARIWIN. It will build toward Outcome 3 by providing recent and pertinent data to the exercise of Community Water Strategy development.

The Senior Administrators Workshop on IWRM (see outline and list of participants in Appendix) was co-delivered by CIMH and McGill in Barbados on May 29 – June 1, 2007. The CI Project Director, Dr. Chandra Madramootoo, as well as the DCETO Project Director, Dr. David Farrell, were both trainers at this event. It was an opportunity to strengthen policy-making capacity by offering knowledge and innovative ideas in IWRM. Seven (seven male and no female) decision-makers with representation from the three partner countries of Grenada, Guyana and Jamaica were trained in IWRM. These results build toward Outcome 2.

An IWRM Training Session in Canada (see agenda in Appendix) was offered to two CIMH personnel from June 24 – July 6, 2007. DCETO Project Coordinator, Kailas Narayan, and CIMH Chief of Meteorology and Climatology, Adrian Trotman, were given the opportunity to attend three intensive days of technical sessions at the Canadian Water Resources Association's annual conference held in Saskatoon. Topics included water quality; land and water stewardship; irrigation efficiency; flood mapping; water, energy and food security; climate change; urban water supply; and

adaptation to drought, among others. These sessions were delivered by leaders in integrated water resources management such as Aly Shady and Laurie Tollefson. The trainees were then guided on field tours of the Brace Centre for Water Resources Management ongoing project sites located in Southern Ontario and Quebec. The trainees also benefited from tours of the McGill campus research facilities and the library facilities. These results build toward Outcome 1.

An Advanced IWRM Course (see course outline and list of participants in Appendix) was co-developed and co-delivered by CIMH and McGill at the CIMH campus in Barbados from September 17-28, 2007. Additional collaboration of experts/trainers from UWI Cave Hill campus (Barbados) and UWI Mona campus (Jamaica) completed the spectrum of topics presented. Three CIMH personnel and fourteen specialists from the partner countries received training in Integrated Water Resources Management during this intensive two-week course. Trainers from McGill were Suchorski, Apurva Gollamudi, Bano Mehdi, and CI Project Coordinator Catherine Senecal. Trainers from CIMH were Narayan and Caesar The opening session was attended by Mr. Yuri Chakallal, Senior Development Officer from the CIDA office in Barbados. The opening session of this course was also an occasion to officially deliver text books and water quality testing equipment to the CIMH Acting Principal. Twenty-three text books (see list of titles in Appendix) were purchased for the CIMH library. These are consulted by faculty and students, and they are also available to the government representatives of CIMH's 16 member countries. Dynamic roundtable discussions amongst participants at this event revealed a collective need for information products that can facilitate the incorporation of climate risk management into decision-making. As a solution, CARIWIN proposed the Caribbean Drought and Precipitation Monitoring Network (CDPMN). The development of this regional network to be hosted at CIMH will centralize data and indices for the monitoring of drought and wet episodes in the Caribbean. It will also build toward the expected project outcome for CARIWIN of CIMH emerging as a strengthened regional training institution and information centre of excellence in equitable and sustainable IWRM. A paper on this new output is expected to be published and presented as part of the Caribbean Environmental Forum to be held in Grenada in June. The upgrading of the CIMH library and laboratory facilities; the synergies with regional water stakeholders UWI and CIDA; and the development of the CDPMN at CIMH all lead to Outcome 1 of a strengthened CIMH. The delivery of IWRM training sessions in which CIMH provides national partners with tools for developing IWRM policies builds toward Outcome 2.

A Hydrometeorology and Water Quality Field Course was co-delivered by McGill and CIMH in Guyana from October 1-12, 2007 in collaboration with the Guyana Hydromet Service. One CIMH staff and twenty-four water managers and technicians representing the three CARIWIN partner countries received practical training in hydrometeorology and water quality during this intensive two-week course. This result builds toward Outcome 2. Trainers from McGill were Gollamudi and McGill graduate student Mark Eastman. Narayan was the trainer from CIMH. The course included a field visit to the CARIWIN pilot community in Guyana which is the St-Cuthbert's Amerindian mission. There, a water quality education and monitoring demonstration was organized for school children. This result builds toward Outcome 3 as it nurtures the partnership between CIMH and the community.

Significant progress was made toward the intended output of making the National water sector data systems in the three partner countries compatible with IWRM principles. Water quality monitoring equipment, the YSI 556 multi-parameter system, was purchased for each national lead organization. Hands-on training for managers and technicians in the use of this equipment was provided during two of the CARIWIN courses. Hydrometric equipment was also purchased during the reporting period in preparation for upcoming training and installation events in 2008. CARIWIN is preparing to develop a Water Information System (WIS) for the country of Grenada in

collaboration with several national agencies and the FAO. A contract has been signed between McGill and Mr. Dejan Lekic for the development of the WIS database. Mr. Lekic has recent experience in the development of similar databases for St-lucia and Jamaica. These results build toward Outcome 2.

Information about the CARIWIN project has been disseminated through a variety of mechanisms in order to raise awareness of the project among water resource managers, scientists, engineers and other stakeholders in the region, as well as Canadians. Project personnel maintain a comprehensive website located at www.mcgill.ca/cariwin (see home page in Appendix). The project was presented at the 7th Caribbean Islands Water Resources Congress, October 25-26, 2007 (see outline in Appendix) by Suchorski. Three articles have been published in McGill print and web-based media (see articles in Appendix). These are "CARIWIN – Caribbean Water Initiative" by Madramootoo, InFocus, Spring 2007; "Lessons from Caribbean Rivers" by Gollamudi, McGill Reporter, November 2007; and "Gender and Water Scarcity" by Suchorski, McGill Reporter, March 2008.

Project planning and monitoring activities take place regularly on several levels:

- Regular interaction with CIMH project personnel
- Project team meetings are held monthly or on an as-needed basis for activity implementation planning as well as overall financial and progress monitoring. Seven such meetings were held during the last reporting period.
- Three Joint Project Steering Committee (JPSC) meetings were held in the region during the reporting period. Madramootoo chaired meetings in Barbados in May 2007; Grenada in January 2008; and Jamaica in February 2008.
- National Learning and Planning Workshops were held in Grenada, January 2008 and in Jamaica, February 2008. Madramootoo met with the leaders and members of the pilot communities together with the National partners to determine short term national priorities and to share the vision of CARIWIN's role. In Grenada, Madramootoo met with the Permanent Secretary to brief her on project progress and to discuss the inclusion of CARIWIN in the Grenada Water Policy. He also met with key project stakeholders; visited the pilot community; and selected location for pilot gauging station. In Jamaica, the roles and responsibilities of national project partners were clarified. The Rural Water Supply Program is responsible for community organization and construction of the gauging station; the WRA for monitoring of CARIWIN activities, equipment installation and data collection.
- Meetings with regional stakeholders based in Barbados were held in January and February 2008 to maintain project alignment with regional priorities and with other regional initiatives. Madramootoo met with Chakallal at CIDA. The encounter generated support for CARIWIN's initiatives in water and gender issues. Madramootoo met with Fletcher-Paul at FAO to discuss the collaborative effort of the Water Information System development for Grenada. The meeting resulted in the leveraging of funds from FAO toward the implementation of the Grenada WIS workshop, planned for June 2008..
- Project team members also collaborated with monitoring activities guided by AUCC. CARIWIN team members Senecal, Mehdi and Suchorski identified challenges encountered in implementation and presented project progress to date when they met with the Project Officer France Tremblay during the annual visit to the University on March 4, 2008. Senecal also answered the extensive UPCD on-line survey for the March 31, 2008 deadline.

Early results have been achieved in Canadian public engagement:

- Canadian students from McGill's Macdonald campus have been involved in field research in a developing country; teaching in a developing country; aspects of project coordination;

providing guidance and support to developing country trainees in Canada; and public engagement activities for Canadians;
- Canadian students from McGill's Bellairs Research Institute in Barbados attended a CARIWIN workshop held at CIMH;
- publication of newsletter articles for Infocus and McGill Reporter available to the McGill community and the broader Canadian and global communities as they are also published on-line.
- Suchorski presented the preliminary results of her research on gender issues in domestic water management at meeting of McGill graduate students and guest lectured to a class of McGill Environmental Assessment students.

Thus far, the main benefits to Canada include an increased number of professionals experienced in international development; and the promotion of the country's high standard of education, research, and development cooperation through international exposure of McGill University.

Results variance

The results achieved to date surpass the results expected. In the second year of this six-year project, CARIWIN has made solid progress toward achieving two out of three outcomes. CIMH is already emerging as a strengthened regional training institution and its national outreach program is already providing water specialists and decision-makers with tools for developing IWRM policies.

Implementation variance

All activities were completed as planned.

Spin-off activities and unexpected results

The addition of a CARIWIN output to develop and launch the Caribbean Drought and Precipitation Monitoring Network (CDPMN) is an unexpected result from this reporting period. Project partners will bring together data from partner countries initially, and the CARICOM eventually, to generate information products useful for decision-making in water management.

Research by McGill Graduate student Alicia Suchorski has resulted in GE information on domestic water use in Barbados and a methodology which can be replicated in the partner countries. Her presence in the region strengthened the dialogue on GE issues with CIMH and CIDA. The addition of a CARIWIN output to generate baseline information on gender equality in domestic water use for the three pilot communities will add significant value to the process of developing Community Water Strategies with the communities.

McGill Doctoral candidate Candice Young has secured financial support from IDRC for her research on point-of-use water treatment systems for domestic use in Guyana. Her research will build on CARIWIN activities in the pilot community of the St-Cuthbert's Amerindian community in Guyana. Young will also administer the GE survey in the Guyanese community.

Students from the Mona GeoInformatics Institute of the University of the West Indies in Jamaica are involved in inventorying water resources in the watershed where the CARIWIN pilot communities of Mile Gully/Warwick Castle are located. Again, this will generate valuable information for the CWS in the CARIWIN pilot community.

5) Communication products

The following communication products were produced during the reporting period:

- Project website

The website is now hosted at www.mcgill.ca/cariwin. It is a comprehensive account of project activities and achievements and it is a valuable resource for materials on IWRM. The site promotes the project globally and allows for partners and stakeholders to easily access recent information.

- Newsletter articles

Three newsletter articles were published in McGill print and on-line publications. These were titled: "CARIWIN – Caribbean Water Initiative" InFocus, Spring 2007; "Lessons from Caribbean Rivers" McGill Reporter, November 2007; "Gender and Water Scarcity" McGill Reporter, March 2008.

- Promotional stickers

A CARIWIN project logo was designed and printed on promotional stickers alongside the logos of McGill, CIMH and CIDA. These are mainly used to identify materials and equipment purchased with project funds.

6) Other information

Success stories

Several training sessions for DC National Partners were co-developed and co-delivered by McGill and CIMH personnel during this reporting period. Course evaluations given to participants at the conclusion of these revealed many positive results.

Quotes from participants of the Hydrometeorology and Water Quality Field Course offered in Guyana: "The training was a vital one in the age and time because we have a lot of water in our country [Guyana} and sometimes we all take it for granted, not thinking about human survival, health and dignity, and how it is a fundamental resource for human development." "The resources and services provided by CIMH were well prepared and delivered. I am very satisfied with the training session." "Outstanding. It adds significantly to my bank of knowledge on water source management." "The material presented will be of great help to my department and government overall." "I admire the efforts being made to solve water resource issues. The effective and efficient use of our water is of paramount importance. This course was a key way of expanding knowledge on water resource issues and needs in each participating country."

Quotes from participants of the Advanced IWRM Course offered in Barbados: "The knowledge gained from this session is tremendous and cannot be given a monetary value." "The materials presented definitely addressed the needs of my government in water management." "The facilities were excellent and the presenters were knowledgeable." "The material presented was relevant and will be useful to my agency. The information will help in carrying out duties more effectively." "CIMH is making a valiant effort with respect to IWRM. It is good to see that the issue of gender mainstreaming is being addressed." "It has been a very interesting, well coordinated training executed by a group of dedicated professionals."

Lessons learned

- The Caribbean region has a real need for hydrologic and climatic data to be available in a structured format.
- The partner countries, which are representative of the region, have an acute shortage of well-trained middle-level specialists and CARIWIN is making small strides toward remediation.
- Partnership in CARIWIN has already afforded learning at CIMH in terms of financial management, whereas areas such as RBM and GE could still be reinforced.
- Following communication protocol and respecting hierarchy within institutions are two critically important points in the smooth-running of a multi-party project.

-

Photo gallery

Training session for CIMH personnel in Canada

Books and water quality monitoring equipment presented to CIMH in September 2007

Participants of Advanced IWRM Course. Barbados, September 2007.

Equipment demonstration and practical training during Advanced IWRM Course. Barbados, September 2007.

Equipment demonstration and practical training during Advanced IWRM Course. Barbados, September 2007.

Break-out sessions during Hydrometeorlogy and Water Quality Monitoring Course in Guyana, October 2007.

Break-out sessions during Hydrometeorlogy and Water Quality Monitoring Course in Guyana, October 2007.

Water quality education at St-Cuthbert's Amerindian Mission primary school.

Appendices

1. **Annual Report from CIMH**
2. **Article "CARIWIN - Caribbean Water Initiative", InFocus, Spring 2007**
3. **Article "Lessons from Caribbean Rivers", McGill Reporter, November 2007**
4. **Article "Gender and Water Scarcity", McGill Reporter, March 2008**
5. **Outline for GE Training and Strategy Development Workshop**
6. **List of participants for GE Training and Strategy Development Workshop**
7. **Outline for Senior Administrators Workshop**
8. **List of participants for Senior Administrators Workshop**
9. **Procurement list to upgrade CIMH library**
10. **Procurement list to upgrade CIMH laboratory and to improve National water sector data systems**
11. **Outline for Principles of IWRM Course**
12. **List of Participants Principles of IWRM Course**
13. **Outline for Advanced IWRM Course**
14. **List of Participants for Advanced IWRM Course**
15. **Outline for Hydrometeorology and Water Quality Course**
16. **List of Participants for Hydrometeorology and Water Quality Course**
17. **Introduction from Document "Gender Equality Strategy for CARIWIN", August 2007**
18. **Outline of presentation made to 7th Caribbean Islands Water Resources Congress**
19. **Table of Contents and Executive Summary from Report "Water, Gender, and Development; Towards Equity in the Management of Water Resources in Barbados and the Caribbean", December 2007**
20. **Project logo created for CARIWIN**
21. **CARIWIN homepage**

Appendix 1 - Annual Report from CIMH

Name: Shawn Boyce
Date: 12/06/08

Re: Report on the Caribbean Water Initiative

The Caribbean Water Initiative (CARIWIN) affords the opportunity to build capacity at different levels with respect to Integrated Water Resources Management (IWRM). IWRM frameworks are very broad by nature and encompass the commitments of various stakeholders. Essential to this cause is the need for training personnel and encouraging public participation. CARIWIN has embraced this need in the project's aims and objectives.

CARIWIN has identified key stakeholders in the three pilot countries for training and are in the process of delivering this training via workshops and seminars. The Caribbean Institute of Meteorology and Hydrology (CIMH) has been identified as a regional implementing agency for the project. CIMH is positioned in the region to deliver training and assist in the installation of hydrometric networks. As such, the project addresses the need for capacity building in IWRM within CIMH to aid in the development of our training, research and development activities.

CARIWIN has provided hydrology texts to the library at CIMH. These texts were a welcomed addition to the library's resources and are currently available to students participating in CIMH courses and University of the West Indies (UWI) post graduate programs. In addition, the project provided water quality monitoring equipment which will assist in our quest for an on site water quality lab for practical demonstration and training.

Staff members from CIMH have attended training workshops hosted by McGill University's Brace Centre for Water Resources Management. To date four staff members have been exposed to modern techniques and technologies currently being practiced and utilized in Montreal, Canada. Last year Mr. Kailas Narayan *(Hydrologist)* and Mr. Adrian Trotman *(Agro-meteorologist)* visited the Brace Centre. The second training visit was arranged for *June 01-14, 2008*. This group comprised of Mr. Shawn Boyce *(Hydrologist)* and Ms. Judy Padmore *(Technician)*. Most of these applications have direct relevance to the Caribbean region where a large amount of work and investment is needed in water resources management.

The training and discussions have been useful and address some of the challenges and barriers currently being faced in the region. Formal links have been made between CIMH and professors, post-doctorates and other researchers at McGill University. With this acquired knowledge CIMH intends to incorporate the awareness of new technologies and techniques into its current training courses and improve on its product and application development. These linkages and course development activities will lend to the sustainability of CARIWIN and provide the necessary ground work for future collaborations.

Appendix 2 – Article "CARIWIN - Caribbean Water Initiative", InFocus, Spring 2007

Investing in our Future

The Macdonald Campus: A Model for Sustainability

Not a day goes by without a mention in the media of global warming, accompanied by dire warnings that, unless mankind radically changes its ways and finds a means to meet its present needs without jeopardizing the future for our children and grandchildren, there will be catastrophic global consequences.

A group of very enthusiastic Macdonald students have risen to this challenge. Dubbed the Mac Sustainable Project, this group of eleven undergraduate students have just released a report, the culmination of two years work, entitled "Ecosystem Sustainability Assessment, Macdonald Campus." The report provides sweeping recommendations, in five key areas — air, water, land, materials and energy — and will be an invaluable tool to decision-makers as Macdonald moves toward meeting its sustainability objectives.

In order to sensitize the campus community to the differences each of them can make to reduce their personal ecological footprint, the group recently hosted an environmental awareness week, with exhibits, lectures, movies and games in each of the themed areas.

The logo created by the Macdonald Sustainability Project was inspired in part by the Macdonald Coat of Arms. It consists of three parts: the tree represents nature and the environment, its three branches the inter-relationship between environmental, social and economic sustainability; the hand represents the care mankind must take with the environment and the planet represents the world in which we live.

CARIWIN – Caribbean Water Initiative

Dean Chandra Madramootoo, Kathryn Dunlop, and Dr. David Farrell, Caribbean Institute of Meteorology & Hydrology at the CARIWIN signing.

The Brace Centre for Water Resources Management, located on the Macdonald Campus, has received $1 million in funding from the Canadian International Development Agency (CIDA), to implement the Caribbean Water Initiative. The six-year project was launched on February 6, 2007, in Bridgetown, Barbados.

The project aims to strengthen the capacity of the Commonwealth Caribbean countries to implement programs and train professionals in integrated water resources management (IWRM). The Brace Centre will collaborate with the Caribbean Institute of Meteorology and Hydrology (CIMH), located in Barbados, and the governments of Guyana, Grenada and Jamaica. Project activities include training of the CIMH staff, and upgrading of laboratory and analytical facilities. Community pilot projects in IWRM will be implemented with rural water-users groups in Guyana, Grenada and Jamaica. Furthermore, water resources staff of agencies in the three governments will receive training in areas such as water quality, climate change, water governance institutions, water conservation, water decision-making systems, demand side management and environmental management. An important aspect of the project is to better understand the roles of gender in the management and use of water in rural communities. This understanding may lead to gender strategies for improved water management. In addition, studies will be conducted on the most appropriate community governance models for water management at the national and regional levels.

Another important feature of CARIWIN is the facilitation of regional and international networking in IWRM. Leading experts within the Caribbean will meet annually to share experiences and ideas. The first such networking activity, the CARIWIN International Symposium in Integrated Water Resources Management, took place during the project launch. Dean Chandra Madramootoo and Dr. Christopher Cox, MSc'97, PhD'03, of the Caribbean Environmental Health Institute, together with other experts, presented the results of on-going water projects in the Caribbean. Dean Madramootoo, Macdonald's water expert and a member of the Brace Centre, will be leading the CARIWIN initiative, assisted by several of the Brace Centre's staff and students.

Appendix 3 - Article "Lessons from Caribbean Rivers", McGill Reporter, November 2007

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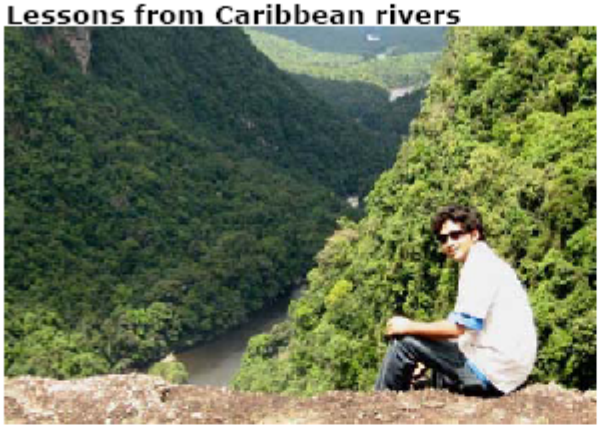
McGill

Lessons from Caribbean rivers



Apurva Gollamudi takes in the view of Guyana's magnificent tropical rainforests in the Potaro River Valley.
COURTESY OF APURVA GOLLAMUDI

BY APURVA GOLLAMUDI

I have been in the Caribbean for two weeks now, coordinating a short course on the principles of integrated water resources management (IWRM) in Barbados, an island quite rightly called paradise. Despite cherishing the opportunity to work at this dream destination for vacationers (and taking time to scuba dive), it is the next two weeks I am really looking forward to. Guyana awaits—a name that literally means "land of many waters".

Along with Mark Eastman of the Brace Centre for Water Resources Management at Macdonald Campus, and Kailas Narayan, Chief Hydrologist at the Caribbean Institute for Meteorology and Hydrology (CIMH), we are here as specialist trainers to deliver a field course on hydrometeorology and water quality. The course is part of a six-year joint project between the Brace Centre and CIMH called the Caribbean Water Initiative (CARIWIN). It was launched in February with funding from the Canadian International Development Agency (CIDA) through their University Partnerships in Cooperation and Development (UPCD) program (more details on www.mcgill.ca/cariwin).

The participants were technicians from water resource agencies in Jamaica, Grenada and Guyana, in addition to a small group from native Amerindian communities in Guyana.

About 90 percent of the 800,000-odd Guyanese live under the constant threat of floods. It is a queasy feeling to live at altitudes of about six feet below sea level and cultivate a fertile stretch of coastal plain that is kept "dry" thanks only to Dutch engineers. They built a high earthen dyke in the 19th century to hold back tides from the Atlantic Ocean. An intensive network of canal systems and kokers (sluice gates) built in the late 18th century regulates and conserves floodwaters from the river, for agriculture. There is a huge budget allocation each year to maintain the sea defences and water conservancies every year. Quite the cost just to stay afloat.

Sharing knowledge

One of the principal objectives of CARIWIN is capacity-building in the Caribbean—at regional, national and community levels. Training courses are one of the means to that goal, with courses designed for target groups ranging from senior administrators to engineers to technicians to community water users. A pilot community was identified in each of our partner countries; the one in Guyana is the St. Cuthbert's Amerindian mission located by the Mahaica River.

Rivers offer hope, risk

St. Cuthbert's, we're told, is one of the more accessible Amerindian missions in the country, and while it is only about 100 km from Georgetown, the journey lasts a memorable four hours. After an hour on the road, we set off in two "speedboats" up the Mahaica. Kailas issues a forewarning: "Don't put your finger into the water. The river is home to the pirai and the caiman." The caiman, alligators that can be up to 30 feet long, are found in the interior. We whirred through the still "black waters," which possess a perfect mirror-like sheen until our boat breaks through the surface. It is known as "black water" because of the

distinctive colour, which comes from high turbidity levels (due to organics) and high iron content. Both surface and groundwater sources in the region are somewhat acidic with a low pH, posing yet another water quality threat to these disenfranchised communities.

At first look, I am impressed by the facilities at the Amerindian village. They have an arts centre, a primary and secondary school, and a centralized solar powered water supply system. We met with the Toshau (captain) and the school principal, who mentioned that there was a recent hike in diarrhea cases among children, although they weren't sure if it was due to untreated water or poor hygiene. In the general awareness session that followed, Mark Eastman demonstrated a portable multi-parameter water quality probe to secondary school students, giving the few curious ones a hands-on experience. The kit was procured for all the partner countries under CARIWIN and participants at the course were trained in its use.

After cooling off with some coconut water, we headed back to our boat. We got lucky on our ride back, as we spotted a dead croc, red-haired monkeys and Guyana's national bird, the Canje Pheasant. As I reminisce, telling myself that these are still early days, I'm quietly confident that CARIWIN will bring about visible change in the region through the development of community water strategies.

At the community level, training and awareness go hand-in-hand

The course drew to a close with field visits on discharge measurements and water level monitoring. The participants were eager to put their lessons into practice, and it was heartening to see the quietest Amerindian in the group take the lead by crossing the stream over a precariously placed log, velocity meter in hand. In a region where vandalism of equipment is just another risk to live with, such educational exercises are of prime importance not only in getting local communities involved in managing their water but also in safeguarding expensive equipment and precious data. The role that local communities play in this is of immense value.

Our short trip ended before we knew it, but not without an encounter with one of the most spectacular sights in nature, and Guyana's pride – the Kaieteur Falls in the tropical rainforests, which at 741 ft is the highest single-drop fall in the world

Apurva Gollamudi is a professional associate at the Brace Centre for Water Resources Management at the Macdonald Campus. After graduating in 2006 with a masters in bioresource engineering at McGill, he continued working at the Brace for Professor Chandra Madramootoo, Dean of the Faculty of Agricultural and Environmental Sciences. In his current role, he manages and conducts research on projects in hydrology, water quality, irrigation and crop water requirements.

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Appendix 4 - Article "Gender and Water Scarcity", McGill Reporter, March 2008

McGill

Notes from the Field: Gender and water scarcity

MCGILL'S WATERWORLD

Gender and water scarcity

Alicia Suchorski

BY ALICIA SUCHORSKI | My research is centered on water, specifically water in Barbados. Why study water on an island where a 360-degree view includes water as far as the eye can see? Surrounded by the Atlantic Ocean and the Caribbean Sea, Barbados is one of the nations where freshwater resources are scarcest – a situation similar to other Caribbean nations. This is where McGill's Caribbean Water Initiative (CARIWIN) project comes into play.

CARIWIN is designed and implemented by McGill's Bruce Centre for Water Resources Management and the Caribbean Institute for Meteorology and Hydrology in Barbados. The project's purpose is to implement a holistic way to view and manage water resources, known as Integrated Water Resources Management within Grenada, Guyana and Jamaica. This approach takes into account various scientific and social considerations, and under the latter we find the issue of gender.

Gender and water are intertwined. When water is not piped directly into a home, it has historically been the responsibility of the women of the household to fetch it. Although not an issue in developed nations, in developing countries, women have to walk many kilometres a day to obtain water for drinking, cooking, cleaning and so on. Because women need to spend their time collecting water, they cannot work or have an income, and that is one way the cycle of poverty sustains itself.

Although water is allocated through a piped system through virtually all of Barbados, crumbling infrastructure and an inconsistent terrain mean service is often interrupted. This leads to periods where water needs to be collected. My work consisted of surveying individuals in the parish of St. James and in St. Lucy in the north. Going to people's homes, we conducted a survey on how they use water in the home: who does the water-related tasks (including cooking cleaning, washing the car, watering the garden, etc.), how much water is used, and how much time is allocated for these tasks per gender.

Preliminary results show there isn't the same strong divide along gender lines as there is with these tasks in developing countries. This is because virtually everyone has piped water coming into their home. However, women more often than not still do the household tasks of cleaning, cooking, washing, etc. even if they work outside the home as well. I expect sharper divisions along gender lines when I go back to survey the other parishes, where breaks in water service force people (probably the women) to go to community standpipes to fetch water.

Although some of the people met us with raised eyebrows and skepticism, virtually everyone else was kind, welcoming, and more than willing to provide me with their two cents' on how water is managed and viewed in their country. One woman even gave me a

bag of limes from her orchard.

I met one man who made me change my ways more drastically than ever. He was on welfare due to a work-related accident, and since his welfare cheque had not come in, he could not pay his water bill. The government agency responsible for potable water allocation (the Barbados Water Authority) turned off his water, forcing him to steal from his neighbours. That's something that will make you think twice about taking a long shower.

Alicia Sucharski is an M.Sc. candidate in the department of BioResource Engineering under the supervision of Dr. Chandra Madramootoo. Her thesis work is based on water and gender issues in Barbados, under a broader IDRC II project that looks at Integrated Water Resources Management in the Caribbean. This project is partially funded by the Canadian International Development Agency.

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Appendix 5 - Outline for GE Training and Strategy Development Workshop

Program for Meeting and Orientation Session

May 23, 2007
Brace Centre for Water Resources Management

Kathy-Ann Caesar - CIMH
Saskia Ivens – consultant
Alicia Suchorski – McGill
Catherine Senecal - McGill

9:30 Introductions
Objectives of the day and project overview (CS)

10:00 Concept of Gender Equality strategy (SI)
Importance and challenges of GE in water management projects (SI)
Design of GE strategy (SI)

11:00 Design of GE strategy for CARIWIN (SI)
Particularities of the Caribbean (KC)
Round table discussions

12:00 ***Lunch***

1:00 Distribution of tasks for GE strategy development (SI)
Wrap-up discussions

2:00 Adjournment

Followed by attendance at the conference:

COLLABORATING IN AFRICA – NEW APPROACHES IN THE WATER SECTOR (May 24th and 25th), Gatineau, Canada

Appendix 6 - List of participants for GE Training and Strategy Development Workshop

Kathy-Ann Caesar - CIMH
Saskia Ivens – Gender and Water consultant
Alicia Suchorski – McGill

Appendix 7 - Outline for Senior Administrators Workshop

CARIWIN SENIOR ADMINISTRATORS WORKSHOP

May 29-June 01, 2007

CIMH, Barbados

Workshop Outline

The workshop will be for a two day period and will cover the following topics:

1. Objectives and goals of the workshop (CAM/DF)
2. Overview of CARIWIN; objectives of the project; description of the project goals and activities; the project partners; expected outputs (CAM)
3. The role of CIMH and its inputs etc. (DF/KN)
4. Principles of IWRM; why is IWRM important (CAM/AG)
5. Incorporation of IWRM into national decision making bodies and strategies (CAM/AG)
6. Use of data for value added products and decision making at the national and community levels (CAM/AG/AT)
7. Involvement of communities in IWRM (CAM/AG/KN)
8. Suggestions for sustainability of the project (CAM/DF/participants)
9. Workshop summary and conclusions

CAM Chandra Madramootoo
DF David Farrell
KN Kailas Narayan
AG Apurva Gollamudi
AT Adrian Trotman

Appendix 8 - List of participants for Senior Administrators Workshop

Senior Administrators Course

Date : May 29 to June 1, 2007

Location : CIMH

Country : Barbados

Facilitators: Chandra Madramootoo, McGill (M)
Kailas Narayan, CIMH (M)
Kathy-Ann Caesar, CIMH (F)

Attendees: Rafi Ahmad, UWI (M)
Roopnarine Tewari, M of Education Guyana (M)
Andreas Haiduk, WRA Jamaica (M)
Herbert Thomas, WRA Jamaica (M)
Lauristen Hosten, NAWASA Grenada (M)
Zainool Rahaman, Hydroment Guyana (M)
Charles Yearwood, Drainage Unit Barbados (M)
Judy Padmore, CIMH (F)
Shawn Boyce, CIMH (M)
Lisa Agard, CIMH (F)
Kathy-Ann Caesar, CIMH (F)
David Farrell, CIMH (M)
Adrian Trotman, CIMH (M)

Appendix 9 - Procurement list to upgrade CIMH library

List of Books Purchased by CARIWIN for CIMH in May 2007

Ward A. et al, (2004), ***Environmental Hydrology***, Lewis Publishers, New York
ISBN: 1-56670-616-5

Hornberger G. M. et al, (1998), ***Elements of Physical Hydrology***, John Hopkins University Press, Baltimore
ISBN: 978-0801858574 (paperback)

Brutsaert, W., (2006), ***Hydrology – An Introduction***, Cambridge University Press
ISBN: 0521824796

Brook, K. et al, (2003), ***Hydrology and Management of Watersheds, 3rd Ed.***, Blackwell Publishing, Iowa
ISBN: 978-0813829852

Dingman, L., (2002), ***Physical Hydrology***, Prentice Hall
ISBN: 0-13-099695-5

Watson, I., Burnett, A.D., (1995), ***Hydrology: An Environmental Approach***, Lewis Publishers, New York
ISBN: 1-566-70087-6 (CRC Press)

Chang, M., (2003), ***Forest Hydrology***, Lewis Publishers, New York
ISBN: 1-84-935332-7 (CRC Press)

Gordon, N. et al, (2004), ***Stream Hydrology***, Wiley, New Jersey
ISBN: 0-470-84358-6

Mays, L.W., (2004), ***Water Resources Engineering***, John Wiley and Sons, New York
ISBN: 0-471-70524-1

Cunningham, W., Saigo, B., (1997), ***Environmental Science – A global concern***, McGraw-Hill, Boston
ISBN: 0-07-330169-8

Soliman, M. et al, (1997), ***Environmental Hydrogeology***, Lewis Publishers, New York
ISBN: 0873719492

Charbeneau, R., (2000), ***Groundwater Hydraulics and Pollutant Transport***, Waveland Press, Illinois
ISBN: 1577664795

Knauss, J.A., (2005), ***Introduction to Physical Oceanography***, Waveland Press Inc., Illinois
ISBN: 1577664299

Garrison, T., (2005), ***Oceanography: An Introduction to Marine Science***, Books-Cole, California
ISBN: 0-534-40887-7 (hardcover) 0-495-11286-0 (paperback)

Kendall, C. et al, (1998), ***Isotope tracers in catchment hydrology***, Elsevier
ISBN: 0-44-450155-X

Chadwick, M., et al (2004), ***Hydraulics in Civil and Environmental Engineering***, Taylor & Francis, London
ISBN: 0-415-30609-4 (paperback)

Viessman, W., Lewis, G.L., (2001), ***Introduction to Hydrology***, Pearson Higher Education, New Jersey
ISBN: 0-673-99337-X

Ward, R.C., (1999), ***Principles of Hydrology***, McGraw-Hill Publishing Co., London
ISBN: 0-07-709502-2

Chow,V., et al, (1988), ***Applied Hydrology***, McGraw-Hill Education, London
ISBN: 0-07-010810-2

Maidment, D., ***Handbook of Hydrology***, McGraw-Hill Education, London
ISBN: 0-07-039732-5

Fitts, C.R., (2002), ***Groundwater Science***, Academic Press, California
ISBN: 0122578554

Bartram, J.B., Ballance, R., (2005), ***Water Quality Monitoring***, Taylor & Francis Group, London
ISBN: 0419223207

Boyd, C.E., (2000), ***Water Quality: An Introduction***, Kluwer Academic Publishers, Dordrecht
ISBN: 0792378539

Appendix 10 - Procurement list to upgrade CIMH laboratory and to improve National water sector data systems

YSI 556 multi-parameter water quality system purchased by CARIWIN: List of parts and accessories

ITEM	QTY	DESCRIPTION
		Instrument
A	4	YSI, model E-528-556-02 Multiparameter Instrument with barometer and soft carrying case
B	4	YSI, model E-528-5563-10 10m cable and DO/Temp/Cond probes includes 6 exchange membranes (5908) and electrolyte in cristal (need to add distilled water to create the 2Mol KCl electrolyte solution)
C	4	YSI, model E-528-005565 pH/ORP probe
		Calibration solutions
D	4	HI7004/1G, pH standard 4.01 (1 gallonUS)
E	4	HI7007/1G, pH standard 7.01 (1 gallonUS)
F	4	HI7010/1G, pH standard 10.01 (1 gallonUS)
G	4	HI7030/1G, conductivity standard 12880uS/cm (1gallonUS) for use in fresh water
		Replacement parts and accessories
H	4	YSI, model 695 Transport / Calibration cup for 556
I	4	G-128-G98, Wash bottle (500ml) (for distilled water for cleaning the DO electrode)

Supplier

HOSKIN SCIENTIFIQUE LTEE
8425 Devonshire, Montreal. Qc. H4P 2L1
Tel. : (514) 735-5267 / Fax : (514) 735-3454
Web Site : hoskin.ca

Toshiba Tecra M9 laptop computer purchased by CARIWIN for Ministry of Agriculture, Guyana: List of parts and accessories

ITEM	QTY	DESCRIPTION
		Personal Computer
J	1	Toshiba, Tecra M9 Laptop
		Software
K	1	Norton 360 Antivirus Protection
L	1	Microsoft Office
M	1	Campbell Scientific Loggernet 3.3.1 Software
N	1	Eco Watch 3.18
O	1	Levellogger 2.0.3

Supplier

McGill Computer Store
3420 McTavish Street, Montreal, Quebec, H3A 3L1
Tel. : (514) 398-5025 / Fax : (514) 398-5185
Web Site : http://mcs.mcgill.ca/

Appendix 11 - Outline for Principles of IWRM Course

CARIWIN IWRM Workshop and Field Tours

Hosted by
Brace Centre for Water Resources Management, McGill University
June 24 to July 6, 2007

As a part of the CARIWIN project, the Brace Centre hosted visitors from the Caribbean Institute of Meteorology and Hydrology (CIMH) in Barbados for two weeks, from 24 June to 6 July, 2007.

AGENDA

25-29 June Mon-Fri Saskatoon Annual Conference of CWRA
30 June Sat Saskatoon-Toronto Return from CWRA conference
1 July Sun Toronto Stay in Toronto
2 July Mon Southern Ontario Determining Irrigation Needs
3 July Tue Southern Ontario Determining Irrigation Needs
Montreal Return to Montreal
4 July Wed McGill Brace (Presentations/Library)
5 July Thu McGill Greenhouse research
St. Emmanuel Water table mgt, Meteorology
6 July Fri Bedford Hydrology, Water Quality

SESSIONS ATTENDED AT CWRA CONFERENCE

Tuesday 26 June 2007

Attended all the plenary sessions.

L. Braul – Technology & input water quality opportunities in Agriculture
J. Yarouski – The environmental impact of five beneficial management practices
S. Albanati – Real time monitoring in the St. Lawrence.
C. Ferreyra – Participatory SWOT analysis of land and water stewardship in the South Nation River water shed.
J. Zhang – The influence of climate on the long-term patterns of dissolved organic carbon in lakes across NE North America

Wednesday 27 June 2007

V. Wittrock – Assessing the vulnerability of prairie communities water supply
T. Dickenson – Trends in extreme rainfall intensities in Ontario
G. Dyck – NAHARP irrigation water quantity and use efficiency indicator development
A. Shady – Water, energy and food security: perspectives and concerns
L. Nicol – Improving water use efficiency and productivity in irrigation: What is feasible.
J. He – The potential influence of climate on storm water quality and its reuse

R. Doria – Modelling irrigation requirements of peaches in southern Ontario using downscaled climate data as input to CROPWAT
D. Stiff – Flood risk in Oxford Nova Scotia: Mapping flood inundation in an ungauged mesoscale watershed.
L. Tollefson – The accomplishments of the National Water Quality and Availability Management Project: an Egyptian/Canadian experience
B. Paterson and Hill – Water use and agriculture: challenges for the future
R. Pederson – Irrigation expansion planning around lake Diefenbaker Saskatchewan

Thursday 28 June 2007

M. Mirza – Climate information needs for water managers
H. Hill – Competing theories of climate change, intersecting adaptation issues and lessons learnt from other countries.
E. Wheaton – Current agricultural adaptation to drought: implications for future water and resource management capacity building.
A. Beersing – Urban water supply and demand management.
M. Ahmad – Impact of resource conservation technologies on productivity and water savings in rice-wheat systems: Evidence from Pakistan
S. Lapp – Prairie drought under natural and anthropogenic climate change.

Visit to Pike Lake.

Appendix 12 - List of Participants Principles of IWRM Course

Participants of Principles of IWRM Course

1. Kailas Narayan, Chief Hydrologist, CIMH
2. Adrian Trotman, Chief of Applied Meteorology and Climatology

Appendix 13 - Outline for Advanced IWRM Course

Advanced Course on Integrated Water Resources Management (IWRM)

Jointly offered by McGill University and the Caribbean Institute for Meteorology and Hydrology

When: September 17th – 29th 2007
Where: *CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY*
Address: Husbands, St. James BB 23006, Barbados

DATE September	TOPIC	PRESENTER(S)
Monday 17 (AM)	Introduction to project and principles of IWRM • Course Introduction; CARIWIN overview • Presentation of books and equipment • IWRM – What & why • IWRM – Caribbean context	David Farrell Catherine Senecal Apurva Gollamudi, Kailas Narayan, Alicia Suchorski, Adrian Cashman
Monday 17 (PM)	• Hydrological data and measurements • Challenges in monitoring, instrumentation • Conducting watershed studies • Effective data management • Modeling as a support tool	Apurva Gollamudi, Kailas Narayan
Tuesday 18	• Water quality • Surface, ground and wastewater • Pollutants, Environmental guidelines • Water quality standards • Source water protection	Apurva Gollamudi
Wednesday 19	• Hydrology and Water quality Monitoring • Link between hydrology and water quality • Agricultural watershed case study • Multiparameter probe demonstration	Apurva Gollamudi
Thursday 20	Fieldwork on hydrological measurement	Kailas Narayan, Apurva Gollamudi
Friday 21	GIS in water resources	Dr. Parris Lyew-Ayee Ava Maxam
Saturday 22	GIS in water resources	Dr. Parris Lyew-Ayee Ava Maxam

Monday 24 & Tuesday 25	Flood Analysis • Hydrologic Principles & Analysis • Flood Routing • Flood Plain Hydraulics • Hydrologic/Hydraulic Simulation Models • GIS in Hydrologic/Hydraulic Analysis • Exercises using WMS & HEC-RAS	Kailas Narayan, Charles Yearwood
Wednesday 26	Climate change impacts on water resources , and adaptation strategies • Science of climate change • Climate impacts on available water • Vulnerabilities to climate in the water sector • Coping mechanisms and adaptation strategies	Bano Mehdi, Adrian Cashman
Thursday 27	Drought monitoring in the Caribbean • Definitions of drought, • Determining soil moisture levels • Coping with drought and low water flows • Establishing a Caribbean drought monitoring network • Drought risk assessment for agriculture • Monitoring soil moisture to assess drought	Bano Mehdi, Adrian Trotman
Friday 28	Gender Issues in Water Management • Defining gender • The importance of addressing gender in water resources management • The international scene – gender and water issues • Examples of gender and water management in the Caribbean context	Alicia Suchorski, Kathy Ann Caesar Linnette Vassell

Sessions will start at 9:00 and end at 16:00, with a break from 10:00-10:30, and lunch from 12:00-13:00

For more information, please contact:
Kailas Narayan
Caribbean Institute for Meteorology & Hydrology
P.O.Box 130
Bridgetown
Barbados, West Indies.
Tel: (246)-425-1362/5
Fax: (246)-424-4733
E-mail: knarayan@cimh.edu.bb

Appendix 14 - List of Participants for Advanced IWRM Course

Advanced Course on Integrated Water Resources Management (IWRM)

Jointly offered by McGill University and the Caribbean Institute for Meteorology and Hydrology

When: September 17th – 29th 2007

Where: *CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY*
Address: Husbands, St. James BB 23006, Barbados

LIST OF COURSE PARTICIPANTS

No	Name	Country	Organization	Designation (Expertise)
1	Savitri Jetoo	Guyana	Guyana Water Inc	Scientific Services Manager
2	Michael Mason	Grenada	Min of Agriculture	GIS
3	Douglas Wilson	Jamaica	Rural Water Supply Ltd	Senior Project Engineer
4	Omhotop Maulut	Grenada	Min of Agriculture	Watershed Officer
5	Wilfred Cameron	Jamaica	Water Res Authority	Asst Hydrologist
6	Joylyn Jafferally	Guyana	Min of Agriculture	Spec Hydrologist
7	Horace Roper	Jamaica	Water Res Authority	Asst Hydrologist
8	Thaeshwari Pooran	Guyana	Min of Agriculture	Hydrological Technician
9	Dave Hicks	Guyana	Drainage & Irrigation	Snr Section Engineer
10	Judy Padmore	Barbados	CIMH	Tech Officer – Hydrology
11	Anne King	Barbados	MARD	Hydrology
12	Charles Yearwood	Barbados	Drainage Unit, Public works	Stormwater Mgt
13	Christopher Joseph	Grenada	Min of Health & Environment	Environmental Mgt
14	Lauriston Hosten	Grenada	NAWASA	Planning Engineer
15	Jony Marshall	Barbados	Barbados Agri Dev	Hydrologist
16	CIMH staff and students attend select presentations and sessions based on interest			

Advanced Course on Integrated Water Resources Management (IWRM)

Jointly offered by McGill University and the Caribbean Institute for Meteorology and Hydrology

When: September 17th – 29th 2007

Where: *CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY*
Address: Husbands, St. James BB 23006, Barbados

LIST OF SPEAKERS / INVITED GUESTS

No	Name	Country	Organization	Designation (Expertise)
1	Yuri Chakalall	Barbados	CIDA	Snr Development Officer (Env)
2	Catherine Senecal	Canada	Brace, McGill University	Professional Associate
3	Alicia Suchorski	Canada	Brace, McGill University	Graduate Student, IWRM
4	Adrian Cashman	Barbados	UWI Cave Hill	Professor
5	Apurva Gollamudi	Canada	Brace, McGill University	Professional Associate
6	Kailas Narayan	Barbados	CIMH	Chief Hydrologist
7	Parris Lyew-Ayee	Jamaica	UWI MONA	GIS
8	Ava Maxam	Jamaica	UWI MONA	GIS
9	Charles Yearwood	Barbados	Drainage Unit, Public works	Stormwater Mgt
10	Adrian Trotman	Barbados	CIMH	Agrometeorologist
11	Kathy Ann Caesar	Barbados	CIMH	Gender and Water
12	Linnette Vassell	Jamaica		Gender and Water

Appendix 15 - Outline for Hydrometeorology and Water Quality Course

CARIWIN Hydrometeorology and Water Quality Field Course

October 1st to 12th, 2007
Jointly delivered by
Brace Centre for Water Resources Management, McGill University
Caribbean Institute of Meteorology and Hydrology, Barbados
Hydrometeorological Service, Min. of Agriculture, Guyana
Guyana Water Incorporated

DATE	TOPIC
WEEK 1	
1 Oct, Mon ***(CIMH, McGill, GWI)***	**The Caribbean Water Initiative** - Overview, project objectives, partners, etc **IWRM** - Introduction to IWRM - This course as a part of CARIWIN **Course Introduction** - Agenda, course descriptions - Logistics - Introductions **Brace and CIMH** - Past and current projects
2 Oct, Tue ***(GWI, McGill)***	**Water Quality: Introduction** - Surface and groundwater quality, wastewater quality - Source water protection - Environmental guidelines, water quality standards **Water Quality Monitoring: Fundamentals** - Ways of monitoring water quality - Parameters monitored - Various Instruments used for water quality monitoring - Hands on exercise or demonstration with a testing kit (GWI)
3 Oct, Wed (*McGill*)	**Water Quality Monitoring: Multiparameter probes** - Instrument Demonstration - Data collection - Software interface - Downloading data - Interpreting results - Instrument Maintenance and Care - Hands on Exercise with YSI probe
4 Oct, Thu (*CIMH, Hydromet*)	**Introduction to Hydrometeorology** - Understanding the Hydrologic Cycle - Precipitation in the Caribbean - Surface Hydrology (floods) - Groundwater Hydrology - Hydro-meteorological Monitoring
5 Oct, Fri (*CIMH, McGill*)	**Hydromet Measurements and Monitoring**

	- Equipment used in Brace projects - Sample outputs - Types of equipment for monitoring flow, climate - Gaging station installation - Maintenance and care
WEEK 2	
8 Oct, Mon *(McGill)*	**The Link between Hydrology and Water Quality** - Case examples from watershed studies in Canada - Estimating loads from flow and water quality monitoring
9 Oct, Tue *(McGill)*	**Database Management** - Hydro and Meteo data monitoring - Use of Loggernet software for downloading data - Use of spreadsheets for simple data processing - Large volumes of data (example from Quebec watershed study) - Hands on exercise on processing data
10 Oct, Wed	***Field Day: Water Quality*** [#] - Visit to St. Cuthberts Mission - Water Quality testing with portable probe - Demonstration and training in the community -
11 Oct, Thu	***Field Day: Hydrology*** [#] - Stream gauging station at Low Creek - Discharge measurement exercise at Low Creek
12 Oct, Fri	**Course Summary** - Discussion session - Feedback from Participants (course evaluation) - Closing Remarks by CIDA representative in Guyana

NOTES:
[#] Field days may be moved to another day if weather is unsuitable
Sessions will start at 9:00 and end at 16:00, with a break from 10:30-10:45, and lunch from 12:00-13:00

Appendix 16 - List of Participants for Hydrometeorology and Water Quality Course

Judy	Padmore	F	Barbados
Joylyn	Jafferally	F	Guyana
Warren	Bernard	M	Guyana
Juanita	Simon	F	Guyana
Sylvania	Alcides	F	Guyana
Shirley	Hamilton	F	Guyana
Clorent	Nials	M	Guyana
Ina	Ranny	F	Guyana
Thaeshwari	Pooran	F	Guyana
Michael	Blair	M	Guyana
Purendra	Parmanand	M	Guyana
Dawn	Shepherd	F	Guyana
Carlyne	Stewart	F	Guyana
Leslie	Cyril	M	Jamaica
Steve	Hudson	M	Jamaica
Colin	Adrian	M	Guyana
Darius	Thomas	M	Grenada
Harold	Merryman	M	Grenada
Cosmos	Charles	M	Grenada
Ann	Alexander	F	Grenada
Dion	Kelly	M	Jamaica
Opal	Gillings	M	Jamaica
Shafiek	Baksit	M	Guyana
Baramdai	Seepersand	M	Guyana
Keno	Galloway	M	Guyana

Appendix 17 - Introduction from Document "Gender Equality Strategy for CARIWIN", August 2007

Gender Equality Strategy for CARIWIN – A Working Document

Gender equality means that women and men have equal conditions for realizing their full human rights and potential to contribute to national, political, economic, social and cultural development, and to benefit from the results. (CIDA 1999)

Introduction

"Attention to gender equality is essential to sound development practice and at the heart of economic and social progress."
(CIDA 1999)

The Caribbean Water Initiative is funded by the Canadian International Development Agency and therefore the CIDA Policy on Gender Equality will serve as a key guide for project collaborators. CARIWIN will work towards integrating the three objectives set out in the CIDA Policy on Gender Equality into project activities: To advance women's equal participation with men as decision-makers in shaping the sustainable development of their societies; To support women and girls in the realization of their full human rights; and To reduce gender inequalities in access to and control over the resources and benefits of development. The purpose of this working document is to clearly state the specific gender equality targets set within the CARIWIN project and to solicit on-going input from partners in determining the best means for achieving these.

Appendix 18 - Outline of presentation made to 7th Caribbean Islands Water Resources Congress

OCTOBER SEVENTH CARIBBEAN ISLANDS WATER RESOURCES CONGRESS 2007

The Caribbean Water Initiative (CARIWIN)

Alicia Suchorski[1], Catherine Senecal[2], and Chandra Madramootoo[3]

ABSTRACT: Water resources management is essential for sustainable growth and poverty reduction; it is also important for addressing such issues as gender equality, environmental sustainability, participatory decision-making, etc. A joint project between the Caribbean Institute for Meteorology and Hydrology and McGill University, was developed with the goal of implementing integrated water resources management in the three partner nations, Grenada, Guyana, and Jamaica. This will be achieved through strengthening the Caribbean Institute for Meteorology and Hydrology, a regional organization whose mandate is to provide training and capacity development in climatology and water management to the Caribbean Community and Common Market member states. Implementation will proceed at all levels of government.

KEYWORDS: Integrated Water Resources Management, capacity-building, Grenada, Guyana, Jamaica

INTRODUCTION

Water resource management is central to sustainable and economic growth. The hydrologic extremes of drought and floods, coupled with pollution, affect Caribbean prosperity. At the local, national and regional levels in the Caribbean, water availability and variability contribute significantly to the risks people face every day in caring for their families and ensuring their livelihoods.

The Caribbean Water Initiative (CARIWIN) is a collaborative project, designed jointly by the Caribbean Institute for Meteorology and Hydrology (CIMH), Caribbean partner governments, and McGill University's Brace Centre for Water Resources Management (BCWRM) to address the complex challenges of water management in the Caribbean region. CARIWIN's goal is to increase the capacity of Caribbean countries to deliver sustainable and equitable integrated water resources management (IWRM). The Global Water Partnership defines IWRM as "a process that promotes the coordinated management of water, land and related resources, in order to maximize equitable economic and social development without compromising the sustainability of vital ecosystems" (n.d.).

In order to achieve the goal of IWRM in the Caribbean, CARIWIN's proposes to strengthen the CIMH, a regional organization whose mandate is to provide training and capacity development in climatology and water management to Caribbean Community and Common Market

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[3] CARIWIN C1 Project Director, Dean of the Faculty of Agricultural and Environmental Sciences, McGill University. E-mail: chandra.madramootoo@mcgill.ca

(CARICOM) member states. By integrating the IWRM approach into CIMH training and capacity development initiatives, the project will have a significant multiplier effect throughout the Caribbean. Through CIMH, CARIWIN will pilot capacity building initiatives in IWRM, aimed at the national, local government and community levels in Jamaica, Guyana and Grenada. The CARIWIN project will increase the relevance and reach of CIMH while developing, testing and disseminating new capacity development and community governance models in IWRM in distinctly different socio-economic, cultural, environmental, jurisdictional and physiographic settings of three CARICOM countries.

CARIWIN will be implemented regionally through the CIMH and its focal point institutions in each of the three targeted countries: the Water Resources Authority (WRA) under the Ministry of Water and Housing in Jamaica; the Hydrometeorological Service under Guyana's Ministry of Agriculture; and the Land and Water Division of Grenada's Ministry of Agriculture. Beyond these immediate partners, with whom CIMH and BCWRM will collaborate directly to plan and manage the project, CARIWIN will build the capacity of key water technicians, decision-makers and other water management stakeholders, including national departments of women's affairs, to increase their understanding and application of IWRM and to integrate issues of gender equality, environmental sustainability and improved governance models into national policy dialogue and practice on water management. At the local government and community level, CARIWIN will work with selected, rural communities in each country, along with their local government interlocutors (Parish Councils in Jamaica and Regional Democratic Councils (RDCs) in Guyana), to strengthen existing community water-users groups and to test new community governance models which address IWRM principles.

REFERENCES

CARIWIN Project Implementation Plan. Prepared jointly by McGill University and CIMH. January 2007.

GWP. N.d. *ToolBox – Why and How IWRM*. Accessed July 23, 2007 from http://www.gwptoolbox.org/index.cfm/site/465EBFAD-C0A3-9DDA-589E7C3A28B5B62E/pageid/46F480C6-9E54-8194-64583214C91B3114/index.cfm

Appendix 19 - Table of Contents and Executive Summary from Report "Water, Gender, and Development; Towards Equity in the Management of Water Resources in Barbados and the Caribbean", December 2007

Water, Gender, and Development
Towards Equity in the Management of Water Resources
in Barbados and the Caribbean

by
Jennifer Bedore
Kim McGrath

McGill University, Bellairs Research Institute
Holetown, St. James, Barbados
December 2007

Presented to:
Ms. Susan Mahon, McGill University
Dr. Inteaz Alli, McGill University

TABLE OF CONTENT

Executive Summary

The issues of gender and development have gained much importance over the years. However, it has only been related very recently to the issue of water access and use. While there is a large amount of information on the subject internationally, there is relatively little concrete data and research obtainable in this field as it is so new. This is especially true of Barbados and the Caribbean. Therefore, this research has been conducted to add to the scholarly discourse pertaining to the issues of gender, development and water access and use within the context of the CARIWIN project. More specifically, the goal of this project was to clarify the issues of gender and development in relation to water access and use in Barbados. Results were obtained by surveying 1% of the total population of the parishes of St. James and St. Lucy. The key findings of this research were that:

- ✓ About development, water access is almost universal throughout Barbados. However, low-income areas have a higher frequency of interruptions then middle and high-income areas.
- ✓ About gender, women use more water and spend more time on water-related tasks then men; therefore, women are more water dependent than men.
- ✓ About both gender and development, women in lower income groups are more affected by water interruptions.

Barbados still has many efforts to make if it wishes to reach both gender equity and equitable water distribution. Concerning water access and quality, equity between different income groups needs to be incorporated into decision and policy makers' agendas. Many water conservation issues were also discovered during surveying, such as burst mains and system leakages. This topic has much potential for future research in Barbados. Further similar research pertaining to gender, development, and water access and use also has the potential to be conducted in other Caribbean nations.

Appendix 20 - Project logo created for CARIWIN

Graphics by Alicia Suchorski and Helen Cohen-Rimmer

Appendix 21 - CARIWIN homepage

CARIWIN - The Caribbean Water Initiative http://www.mcgill.ca/cariwin/
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CARIWIN

The CARIWIN website is hosted by the Brace Centre for Water Resources Management
The Caribbean Institute for Meteorology and Hydrology is McGill's joint partner for CARIWIN

CARIWIN

The Caribbean Water Initiative

CARIWIN is a project on Integrated Water Resources Management (IWRM) in the Caribbean, led by the Brace Centre for Water Resources Management at McGill University and the Caribbean Institute for Meteorology and Hydrology (CIMH), Barbados. The 6 year project was launched in February 2007 and is funded by the Canadian International Development Agency (CIDA), through the University Partnerships in Cooperation and Development (UPCD) program. The UPCD program is administered by the Association of Universities and Colleges of Canada (AUCC)
Government agencies from three partner countries - Grenada, Guyana and Jamaica - collaborate closely with the CIMH and
Brace, to help achieve the overarching goals of poverty reduction and gender equality through a process of institutional capacity
building in integrated water management.
The project aims to improve existing capacity in these 3 pilot countries by involving local community organizations, water use
associations and regional and national networks. Several training courses will be held each year on the principles of IWRM;
hydrometeorological data processing and management; use of field instrumentation; and water policy. These courses have been
designed for all stakeholders ranging from community water users to technicians to engineers to senior administrators.

CARIWIN ABC's

A. Work Plan:

CARIWIN Workplan [.pdf]

CARIWIN - The Caribbean Water Initiative http://www.mcgill.ca/cariwin/
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B. Goals, Outcomes and Outputs:

CARIWIN LFA [.pdf]

C. Latest Annual Report:

2006-07 CARIWIN Annual Progress Report [.pdf]

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