

Case Study on the Impact of Climate Change on Water and Sanitation in Jamaica



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List of acronyms

CARIBSAN	Caribbean Sanitation
CARICOM	Caribbean Community
CBO	community based organisations
CCGEP	Canada Caribbean Gender Equality Programme
EFJ	Environmental Foundation of Jamaica
INC	Initial National Communication
MDGs	Millenium Development Goals
MG/WC-DBS	Mile Gully /Warwick Castle/ Development Benevolent Society
MOWH	Ministry of Water and Housing
NGOs	non-governmental organisations
NIC	National Irrigation Commission
NWC	National Water Commission
ODPEM	Office of Disaster Preparedness and Emergency Management
RADA	Rural Agricultural Development Agency
RLC	Rural Livelihoods Cluster
RWP	Rural Water Programme
SIDS	Small Island Developing States
TEA	Trinityville Extension Area
UNDP	United Nations Development Programme
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNFCCC	United Nations Framework Convention on Climate Change
WBP/DBS	White horses, Botany Bay and Pamphret Development Benevolent Society
WEDO	Women's and Environment Development Organisation
WMC	Water Management Committee
WROC	Women's Resource and Outreach Centre

1. Introduction

The slogan of the National Water Commission in Jamaica, ‘water is life’, is widely embraced by the Jamaican public and often finds expression on the banners of demonstrators, mainly from rural Jamaica, and predominantly women, who not infrequently rally themselves to protest for water. Poor sanitation, resulting in absence or inadequacy of toilet facilities, is generally hidden from public gaze and is seen as a ‘personal matter’.

That potable water and adequate sanitation and hygiene conditions are not within the reach of thousands of Jamaicans, is a major public issue which has implications for the health and well-being of the whole local community and nation. Further, because of gendered roles, the burden of care for the family falls on women. Consequently, the provision of water and sanitation:

- advances women’s health prospects on an individual basis as well as in their role and work as nurturers of children and care of the sick and elderly;
- reduces their burden of domestic responsibility;
- increases women’s time availability and hence enlarges their choices for time use, for example, to pursue economic and social opportunities;
- encourages greater attendance of girls and boys in schools.

Indeed water and sanitation are critical to the achievement of all the Millennium Development Goals (MDGs): ‘To eradicate extreme hunger and poverty; to achieve universal primary education; to promote gender equality and empower women; to reduce child mortality; to improve maternal health; to combat HIV/AIDS, malaria and other major diseases; and to ensure environmental sustainability. Significantly, also, the MDGs cannot be achieved and sustained to any significant degree without addressing gender inequities and promoting and securing women’s human rights.

The possibilities for achieving the MDGs are severely undermined as we today experience and contemplate the future impact of various manifestations of climate change: ‘The defining human development issue of our generation’, on our country and region.¹

1.1. Methodology

The methodology used to prepare this case study that explores the impact of climate change from a gender perspective involved the collection of primary and secondary data through focus groups, in-depth interviews and documentary research on gender and climate change. The focus groups and interviews were conducted with representatives from the communities of Somerset and Mile Gully who had participated in the gender and water study and who shared their experiences in the project.

¹ UNDP (2008). *Human Development Report 2007: Fighting Climate Change: Human solidarity in a divided world*. p. 1

The documentary research included web-based research as well as a review of local studies on issues of gender, water and sanitation, produced by the Ministry of Water and Housing (MOWH) under the Rural Water Programme.

The Women's Resource and Outreach Centre (WROC) is a women's advocacy organisation that works on issues of sustainable livelihoods with rural communities in St. Thomas. It also has a programme which includes a focus on disaster mitigation measures. WROC facilitated contact with the communities for the purposes of conducting this research.

2. Exploring the context: some issues

We are far from understanding or agreeing on what climate change means for Jamaica and its implications for water and sanitation. A recent exchange on a forum being conducted by Climate Frontlines brought to the fore disagreements about whether changes in weather patterns for example, can be taken as evidence of climate change in the Caribbean².

However, as the 2007 Human Development Report states:

‘No single climate shock can be attributable to climate change. However, climate change is ratcheting up the risks and vulnerabilities facing the **poor**³ It is placing further stress on already over-stretched coping mechanisms and trapping **people**⁴ in downward spirals of deprivation’.

Who are the poor?

Who are these **people**? The answer is that they are economically disadvantaged men and women. Because they have different socially defined roles and responsibilities in the home, community and society, flooding, hurricanes, drought, deforestation and other manifestations of natural hazards and climate change impact them differently. Water and sanitation challenges especially have an adverse impact on the health of families and communities and add to the burden that women face in terms of their productive, reproductive and community management roles.

How are poor women and men affected by water and sanitation as a result of climate change?

This case study on gender and climate change with respect to water, focuses on water for use in the domestic household, as well as water for use in agricultural production. This case study does not include other water-related issues such as gender and fisheries, irrigation, watershed and coastal zone management. These are issues that also need further research because they are critical to deepening our understanding and guiding development options and actions.

This case study on Jamaica on gender and climate change therefore explores:

- the different jobs and tasks that men and women have, based on the gender division of labour and how climate change may alter this pattern and bring different risks and opportunities to them;
- the difference in men's and women's access to resources (for example water, land and social networks) and how climate change may present them with different options and possibilities for coping;

² See Forum- [Http:// climatefrontiers.org/lists/?p=subscribe](http://climatefrontiers.org/lists/?p=subscribe) “Early Flower, new fish-late berries, few whales”. Downloaded 14 August 2008.

³ Author's emphasis

⁴ Author's emphasis

- the difference in knowledge and skills that men and women have, based on their distinct roles in society and how men and women may bring these different knowledge sets to respond to climate change;
- the difference in men's and women's access to decision-making and how women can participate more effectively and have their ideas represented in decision-making about water and climate change.

When the impact of climate change is considered in the Jamaican and Caribbean context, the region's experiences of hurricanes and the high level of vulnerability that countries face as Small Island Developing States (SIDS) are the main focus of attention. This reality was stressed by delegates participating in the recently held Commission on Sustainable Development at the United Nations in New York. According to the report, delegations 'noted that the effects of climate change had already been felt throughout the region, particularly in the Caribbean sub-region'. The vulnerabilities of the region in terms of food insecurity, rising energy prices and the rise of sea levels were among the issues stressed.⁵

The United Nations Economic Commission for Latin America and the Caribbean (UNECLAC) 2005 gender impact assessment of hurricanes and the experience of Grenada with Hurricane Ivan provides important insights into how women become trapped by these vulnerabilities and the sharp deprivations they experience because of the gender system. The study revealed, for example, that the low level of land ownership among women, and their low or non-existent construction skills meant that they could not easily access important housing benefits or jobs in construction.⁶

The UNECLAC study on Grenada also supports the conclusion of a recent study by the Women's Environment and Development Organisation (WEDO), that climate change is essentially a human security issue: security of survival, of livelihoods and of dignity.⁶ Planning for adaptation, the WEDO study states, must take into account the far reaching implications that security, broadly defined, brings into the conversation on climate change. The views of women who are so deeply affected must therefore be included.

⁵ United Nations Economic and Social Council (2008). *Commission on Sustainable Development, Sixteenth Session, 5-16 May 2008. Agenda Item 5a.*, p. 47

⁶ United Nations Economic Commission for Latin America and the Caribbean (UNECLAC) (2005). *Grenada: A Gender Impact Assessment of Hurricane Ivan - Making the Invisible Visible*

⁷ *Gender, Climate Change and Human Security: Lessons from Bangladesh, Ghana and Senegal*. Prepared by ELIAMEP, May 2008.

⁸ See for example, Witter, M. (2007). *Climate Change and Jamaica: Sustainable Development as Strategic Adaptation*.

In Jamaica, the public conversation on climate change is not very well advanced. However, information on projected impacts in terms of rises in temperatures, decreased rainfall, sea level rise and possible increase in the frequency and intensity of hurricanes, is very slowly coming into the public domain. While local experts are making important contributions to research at the regional and global level,⁹ the conversation has not touched the ground where the impacts are most acutely felt. Thus very little is known of the United Nations Framework Convention on Climate Change (UNFCCC) and the work being done by the Local Focal Point office, located in the Meteorological Office. Yet Jamaica did present the Initial National Communication (INC) in 2000 in fulfilment of the country's obligation under the UNFCCC. The INC began discussion on Jamaica's climate change vulnerability and potential impacts. It also examined adaptation options and identified several important gaps, including low levels of awareness on climate change issues.

In March of this year, discussions towards the Second National Communication to the UNFCCC began and included a focus on Water and Agriculture. Among the key observations were the following:

- Climate change is not mentioned in the Agricultural Development 2005-2008 Plan, hence the potential impacts of climate change on agriculture have not informed policy, strategies nor plans;
- There is need for adaptation strategies to include the development of crop varieties that can respond to increased temperatures and that are drought and pest resistant;
- There is need to recognise the importance of improved land use management as a strategy to protect the quantity and quality of water resources. Rural and agricultural communities have a key role to play in this, it was observed;
- Three of the ten Water Management Units/Basin in which the country is divided are water stressed catchments, due to high demands from industry and agriculture. Hence 'even under average climatic conditions, a significant proportion of the Jamaican population and important parts of the Jamaican economy are vulnerable to the risk of water supply shortfalls';¹⁰
- Existing climate and climate variability as well as human activities such as 'inadequate settlement patterns and land use practices', increase environmental sensitivity and the vulnerability of men and women to climatic events.

⁹ Two Caribbean scholars, Professor Anthony Chen of the University of the West Indies, Mona, and Dr. Leonard Nurse of the Centre for Resource Management and environmental Studies at UWI, Cave Hill, contributed to the 2007 Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) looking specifically at SIDS issues. A Nobel Prize, in which they shared, was awarded for this work.

¹⁰ Enabling Activities for the Preparation of Jamaica's Second National Communication to the UNFCCC. Vulnerability and Adaptation Assessments. Work Package 2: Water Resources and Agriculture. Task 3: Review of Nature and Scope of Problem. (Unpublished, p. 53).

These very important conclusions indicate that what is often promoted as ‘development’ has serious consequences and implications for the sustainable development and use of water resources. It also implies that men and women must initiate and participate in realistic climate change adaptation measures. Another important issue is the low level of coordination and integration among institutions involved in water resources management, which begs for effective leadership to integrate water resources management provisions.

But the voices of the women and men who are most deeply affected are weak. Most thinkers and planners pay little or no attention to the implications of these developments on women and men as they experience life in their communities. Hopefully, there is openness on the issues and it is anticipated that men and women from the rural and urban communities will have the opportunity to contribute to the discussions to support preparation of the Second National Communication to the UNFCCC. Their participation in the process will give more visibility to their own experiences as well as to issues of gender and development, particularly those that relate to water resources and agriculture.

3. Characteristics and experiences of the local communities

3.1. Profiles of the local economies – Somerset, St. Thomas and Mile Gully & Warwick Castle, St. Mary

To introduce the issues of gender and climate change related to water and sanitation in the communities studied, this section of the report presents the profile of a female farmer which illustrates the experience of many rural women.

Box 1: Joan Buchanan, Farmer

Joan Buchanan, a 50 + year old widow, and mother of two high schools girls, farms in two localities: way up in the hills of Font Hill where she plants mainly carrots, and on the plains near to Seaforth in the eastern parish of St. Thomas. On the latter five-acre lot, she cultivates a little of everything: pumpkins, tomatoes, corn, peas, okras and ginger. There are a few grown coconut trees on the property and if she had the opportunity, she would plant more of the permanent crops. This is not now advisable because the land which belongs to the government, was leased to a large farmer who has abandoned farming. This has opened the way for some men and Joan, as the only woman, to temporarily ‘capture’ a portion of the land, hoping that in time it will be leased or sold to them.

Farming is Joan’s life. It is the only means available to her to feed and send her children to school. She has to confront many challenges to eke out an existence on a daily basis as she revealed in a newspaper interview recorded in Appendix 1. She sees climate change impacts in terms of the floods and ‘blistering heat’, and the loss of crops from flooding from the too frequent hurricanes. These conditions are aggravated because she owns no land that could be used to obtain credit and has little influence with the ‘powers that be’.

Joan works within the Trinityville Extension Area (TEA), an administrative zone of the Rural Agricultural Development Agency (RADA) of the Ministry of Agriculture and Lands. She is a member of a community based organisation of the same name.

3.2. Women's Resource and Outreach Centre (WROC)'s Baseline Study

Joan Buchanan's experience is drawn from a 2006 baseline survey undertaken by WROC of 150 of its farmer beneficiaries mainly from TEA¹¹. This study was done in collaboration with several community organisations: the Whitehorses, Botany Bay and Pamphret Development Benevolent Societies in western St. Thomas; the Somerset Citizens' Association; the Mt. Vernon Women's Group and other partners in the Johnston Mountain and Springbank area of eastern St. Thomas. The majority of respondents were 'cash crop' and poultry farmers. Due to the requirements to access project benefits as required by WROC, 51 percent of the cash farmers were men and 49 percent were women.

Access to land: Results of the study showed that some 53 percent of the farmers surveyed worked on small holdings of less than two acres. Another 20 percent were like Joan Buchanan, who worked on plots between two and five acres, which are typical of the national allocation for small farmers. In Jamaica, farms between 0-10 acres such as those operated by respondents make up 92 percent of units but occupy only 36 percent of the national farm acreage. Farms of 100 acres or more, are 0.5 percent of all farm units, but occupy 39 percent of total acreage. Besides their disadvantage in terms of farm size, Joan and many of these farmers are forced to cultivate several small plots in different localities which hampers efforts at effective environmental management.¹²

Household heads: More than half of the farmers surveyed are married or live in common law unions. All of the male poultry and cash crop farmers are regarded as heads of households, defined in terms of who is the chief bread winner, however some 41 percent of poultry and 48 percent of cash crop farmers are female heads of households.

Age: Over 50 percent of the respondents were between 30-50 years old, 27 percent were over 50 years, while 17 percent were under 30 years.

Family size: Some 43 percent of them lived in homes of over seven (7) persons; 72 percent had children in their care and 33 percent had persons of 60 years and over. Overall this shows a high level of dependency within the households.

Estimates of income: Estimates of income were that 73 percent of cash crop farmers earn less than J\$10,000 (US \$150) monthly, and 25 percent earn between US\$150 and US \$450 monthly. It is therefore not surprising that some 43 percent reported that they supplement their income with other activities.

¹¹ Thompson, S. (2007). Women's Resource & Outreach Centre, Assessment of Farmers' Livelihood Conditions in St. Thomas.

¹² Enabling Activities for the Preparation of Jamaica's Second National Communication to the UNFCCC: *Vulnerability and Adaptation Assessments Work Package 2: Water Resources and Agriculture*. Working Paper. Undated.

3.3. Profile of Somerset community

Overview

Somerset is a high-producing agricultural district in TEA some miles from where Joan has her farm. In July 2008, eleven farmers (seven men and four women) sat next to their nursery of small communal seedlings to discuss plans for the rehabilitation of the nursery. The project produces pepper seedlings to be sold to each other as members of the farming group and to other citizens. In addition to their farming group, many persons are active in the Somerset Citizens' Association which had recently had a successful fund raising event to meet community needs.

As these men and women sat under the shade of coffee trees, with the river flowing slowly below, they began to express concern about the heat and the start of the hurricane season as well as what could possibly happen.

Gender division of labour in economic activities

In this community of some 2,000 persons, farming is the main occupation of about 90 percent of the adult population. Some 80-90 percent of the farmers are men, many of whom combine farming with work in construction when this is available. A few men are motor vehicle mechanics.

The majority of the women in Somerset are unemployed. However they do contribute to their households by their unpaid work in the family, as well as from the small gardens which they keep around the house to supplement food supplies.

Joan and the remaining 10 percent of women, who are farmers, face challenges which reflect and reinforce the gender division of labour. The research showed that more women are interested in farming, but do not have access to land. Most of the other women who work in agriculture market farm produce from their own holdings or that of their spouses. Some also purchase and sell produce from farmers. The few professional women in the districts are teachers and nurses who work in nearby districts or in Morant Bay, the main town of the parish which is some miles away. A few women work in hairdressing and dressmaking activities.

Main agricultural activities

Somerset is the home of carrots. Residents tell of days gone by when two or three trucks filled with bags of carrots would leave the district daily for markets in Kingston. This is a major livelihood pursuit for women because it keeps them close to home, enabling them to combine looking after their family with earning an income. Growing carrots is still the main farming activity although the volume of production has definitely been reduced. On a daily basis, many carrots are dug, washed in the river mainly by women, and packed in bags. They are either sold to higglers (market vendors), transported to markets or sold to women and men from the same district.

Other cash crops like plantains, bananas, peppers, tomatoes, peas and beans are also grown for sale and for home consumption. A few women are also involved in chicken production, a business

activity that every six weeks can bring birds to market.

Challenges of climate change

The livelihoods of the residents of Somerset and other St. Thomas communities are threatened by various hazards which could be exacerbated by climate change. In Somerset itself, there is material evidence of buildings destroyed by the ravages of flooding and land slippage. The frequency and intensity of these occurrences are expected to increase with the expected impact of climate change.

3.4. Profile of the communities of Mile Gully and Warwick Castle, St. Mary

Overview

Situated in the centre of the country, Mile Gully and Warwick Castle are two distinct communities in St. Mary. However they work together as the Mile Gully/Warwick Castle/Development Benevolent Society (MG/WC-DBS) to implement a government sponsored community managed water project that serves the 800 men, women and children who reside in the communities. The Benevolent Society has also been involved in data collection to inform the implementation of an environmental sanitation project.

According to 2005 data, Mile Gully, the larger community, had over 650 residents while Warwick Castle had some 150 persons. Family structures varied widely but the most common in Mile Gully were households with both parents (31), while in Warwick Castle, the largest family category was single mothers.¹³ Children aged 0-9 years and persons 65 years and older, make up a significant proportion of the population of both communities. This means that these individuals are highly dependent on other persons for care and support.

The profile of households showed that over 80 percent had one to three males living in them, while some 33 percent in Warwick Castle and 20 percent in Mile Gully had no females living in them.

Economic profile

Out-migration of women seeking jobs as household workers, hotel workers or even further afield, often as security guards, explains the lower number of women in some households.

Men and women have different skills and occupations. As in Somerset, men in Warwick Castle have a variety of skills: building, auto mechanics, welding, tailoring and shoemaking, but employment opportunities are very scarce.

Females across all age groups reported a significantly lower level of employment than men and their occupations fall within the traditional gender division of labour as domestic workers, farmers, and clerical workers. Women also have a higher level of unemployment than men which was linked to

¹³ Hamilton, P. (2005). Profile of Mile Gully and Warwick Castle Communities, St. Mary.

their level of skills. Some 61 percent of women in Mile Gully and 57 percent in Warwick Castle were unskilled. In comparison, 37 percent of men in Mile Gully and 48 percent in Warwick Castle were unskilled.

In addition to farming, many women are small poultry farmers, like their counterparts in Somerset. In their backyards, they raise chickens and bring 50 to 100 birds to market every six weeks. A few women have also gone into honey production. These business activities are risky, as they are threatened by natural hazards and market conditions. Chicken production, for example, requires a regular supply of clean water. In many cases, producers have to pay persons to go some distance to collect water at the standpipes which increases production costs. Often these micro enterprises provide very small returns on investment so much so that the owners/workers are not able to pay themselves from the activities and are only able to turn over cash which they reinvest in the business.

Challenges of water and climate change to economic development

The unavailability of drinking water presents a big barrier to the economic development of community members. Women reported that they would like to produce products from the fruit which abound as raw materials. However, they reported that they were not able to translate their ideas for fruit juices, jams, jellies and other food-related activities into practical projects because water is generally unavailable. Women were also interested in setting up small hairdressing enterprises but faced a similar problem with respect to water.¹⁴

In the communities visited in St. Thomas and St. Mary, it is evident that life is hard for both men and women. However, it was evident that women:

- have less access to land resources;
- have lower level skills sets, hence have fewer options for self-employment;
- face challenges with access to credit, because they lack the collateral required;
- have their livelihoods as vendors highly dependent on production, which is largely controlled by men and the men can make alternative arrangements about marketing at any time;
- have their prospects for self-employment jeopardized and face higher costs because of the challenges with accessing potable water for chicken rearing, for example;
- are forced to restrict their production because of the absence of irrigation.

Men also face some of these challenges, such as the absence of irrigation. However, the cumulative effects of the many other issues affecting women's productive endeavours result in greater levels of deprivation and consequently higher levels of women's dependency on men.

¹⁴ Ministry of Water and Housing (2006). Water and the Community: A Gender Perspective. Multimedia DVD.

3.5. Water in the communities

One stated goal of the 2004 Jamaica National Water Policy is the provision of access to potable water and adequate sanitation to all Jamaicans by 2010.¹⁵ In general, access denotes:

‘Availability of at least 20 litres per person per day from an improved (or safe) source within 1 kilometre of the user’s dwelling’.

Water access and quality

The National Water Policy (2004) reveals that more than half of the estimated 8 percent of the population which obtains water from untreated sources such as rivers, streams and ponds, travel in excess of 46 metres while some travel as much as 914 metres.

The research study showed that two communities faced a similar situation. A large segment of the populations of Mile Gully and Warwick Castle and some 35 percent of persons surveyed in TEA were affected and in many cases it was worse. In Mile Gully, for example, some 74 percent of residents access drinking water from a public standpipe under the control of the St. Mary Parish Council. However, a sign at the source warns residents that they must boil the water because more often than not the supply is untreated.

In Warwick Castle, 57 percent of residents use water from the standpipe. The water is channelled from the stream which is also the major source for washing. Most households also collect water from their roofs when it rains. These results show that under ‘normal’ conditions, residents of the two communities face challenges to access water of acceptable quality.

Gender and water: lessons from Mile Gully/Warwick Castle

Results of a 2005 research project included the Mile Gully/Warwick Castle communities. The study was conducted under the Rural Water Programme of the MOWH and focused on gender, water and sanitation in two rural localities. Most of the data were taken from the Mile Gully/Warwick Castle area. The study also provided insight into irrigation issues in the Gravel Hill community in Clarendon and highlighted the travel distances required to access water. The 2005 study provides valuable insight for the current case study and shows that:

- Residents travel varying distances to access water. Depending on one’s location in Mile Gully, it can take from 5, 10 to 20 minutes to access water from one of the three sources - Silver Spring (river), Chapel Spring (standpipe) or the Sambo River. This represents a minimum walking distance of under 1000 metres and a maximum of up to 5000 metres.¹⁶ In Warwick Castle, the residents living the furthest distance from the standpipes walk 3000-5000 metres for up to 25 minutes; the river is located some 20-40 minutes away.

¹⁵Ministry of Water and Housing (2004). Water Sector Policy and Action Plan

¹⁶See Barrett, B. (2005). Gender, Water and Sanitation Project: Participatory Learning and Action Report.

- Women and men carry water for different purposes. In both communities women and children have the main responsibility for carrying water for cooking, washing, health and hygiene purposes; men carry water mainly for their livestock and other agricultural pursuits;
- Women and men carry different volumes of water daily. On average women carry 114-133 litres while men carry 76-95 litres, two to three times per day;
- Washing clothes places a major burden on women because of the large quantities of water required to complete this chore. Buckets to transport water from the source to home often weigh 25-40 pounds. Some women typically take their families' clothing to a river for washing and then have to carry the washtubs on their heads to their homes with wet clothes which weighs more;
- Children also carry water: Children start carrying water from as young as three to four years old. Children living with single mothers are, in addition, more at risk as their need to collect water sometimes affects their punctuality and attendance at school;
- Lack of easy access to water places women at risk of sexual abuse. Some women bathe in the rivers and springs to reduce the time and work involved in taking water home, but this practice is a threat to women's safety and some of them have been exposed to sexual harassment;
- Carrying water exposes women and men to health problems. Some women reported that they suffer from sprained ankles, neck and shoulder pains, broken joints and pulled muscles. In some instances, women suffered miscarriages because they carry water throughout the nine months of their pregnancy. Some women also reported that they suffer heavier bleeding when they are menstruating and have to carry water. They are also unable to take baths in the river when they are menstruating. In addition, they complain of extreme tiredness and of feeling weak when they have to carry water during this time. Men also complained of pains and fatigue from carrying water.

The amount of water carried for an average household of three to four persons is less than the required amount, and this poses a risk to sanitation and health;

- Lack of easy access to water is time consuming. On average, two to five hours daily are spent on carrying water;

- Longer waiting periods for water. During the drought period, there is a reduction in the river flow, and the water flow decreases. The water then becomes stagnant and full of morass which makes the location impossible for washing. This, in turn, results in overcrowding and longer waiting periods at the standpipes;
- Increased costs for water. Households have to spend more of their income to buy water. This places a special burden on families, especially female headed households;
- Negative impact on households without males. When water has to be sourced outside of the immediate communities, men become more involved in carrying water on bicycles or bikes, or in vans or trucks. Households without male support experience additional pressure;
- Increased time burden and costs for women. Women have to spend more time to purify water, either by boiling, which is more costly, or by treating water with bleach.

Disasters magnify the scale and impact of the above-mentioned conditions and bring additional challenges. For example, there are threats from dead animals and, especially, from the damage and destruction of toilets which negatively impact sanitation and hygiene.

3.6. Sanitation in the communities

The position paper on Sanitation in the Caribbean presented at the recently held CARIBSAN 2008 meeting in Kingston has stated:

Box 2: Sanitation in the Caribbean, 2008

‘Research has indicated that only a small fraction of industrial and municipal wastewater is treated before being discharged into surrounding land and water resources. This is true of Jamaica, where the sewerage infrastructure supporting parts of the Kingston Metropolitan Area has deteriorated over the years resulting in the release of untreated and poorly treated sewage into the Kingston Harbour. Also, in most Caribbean countries, rural sanitation gets far less attention and financial support than urban sanitation’.¹⁷

Poor sanitation is a problem for some Jamaicans. For example, the 2001 population census of Jamaica indicated that approximately 19,000 households (2.5 percent of total households) had no access to any toilet facilities; 20 percent shared access to water closets or pit latrines and 74 percent had exclusive use of water closets or pit latrines.

¹⁷ Smith, I. (2008). Sanitation in the Caribbean: Policies, Legislation and Programmes. p.4.

The study showed that residents in the communities studied were among these vulnerable households. It revealed that in Mile Gully and Warwick Castle, 74 percent and 79 percent of residents respectively, use pit latrines. Flush toilets were owned by 17 and 12 percent respectively; 20 percent of families in Mile Gully and 26 percent in Warwick Castle share toilet facilities with others. In both communities, 32 percent of households reported that their toilets are 'not too good', while 16 percent described them as being 'in poor working order'.¹⁸ Two (2) percent of households in both communities also reported not having any toilets.

In addition to households, the poor state of water, sanitation and hygiene in the public schools is also a concern because these factors have a strong bearing on the quality of the educational experience of children and youth. Data from the Ministry of Education show that approximately 40 percent of schools have neither an adequate water supply nor toilet facilities.¹⁹

The discussion on gender, water and sanitation related to climate change also encompasses health and hygiene. It thus has implications for: the poor state of public sanitary conveniences; the extent of solid waste generation and weaknesses in its collection; the proliferation of waste plastics and other garbage which pollute the sea and have consequences for the marine environment; the dumping of untreated sewage into the sea and on land; and the poor containment of household, community and commercial garbage. Understanding these realities helps us to appreciate more fully the scope and impact of the sanitation and hygiene challenges on a national scale as well as in the communities studied.

The impact of climate change associated with flooding from heavy rainfall and hurricanes affects the state of sanitation and hygiene in communities. Research in the rural communities showed that toilets were blown down or were flooded as was the case in Somerset. This destruction released faecal matter directly into the environment, including the rivers. This solid waste then threatens the health of people in the communities and especially the health of children. In Mile Gully, for example, parents reported that their children were experiencing itching and bumps and fungus from bathing in rivers, while they themselves were suffering from headaches and fatigue from carrying water.

This was not surprising as, at the national level, analysis of data over the past four (4) years revealed that there has been an increase in the occurrence of diseases related to improper water sanitation and hygiene practices in Jamaica. This situation included: Gastroenteritis (2004), Typhoid (2004), Leptospirosis (2004 & 2005), and Malaria (2006 & 2007). Of 5,485 cases of gastroenteritis recorded in 2006 from the entire Caribbean sub-region among persons aged five years and over, 73 percent were recorded in Jamaica.²⁰

¹⁸ Hamilton, P. (2005). Profile of Mile Gully and Warwick Castle communities, pp. 13-15.

¹⁹ Smith, I. (2005). National Sanitation Policy for Jamaica (Draft).

²⁰ Newspaper clippings, Health 2004-2007 and Planning Institute of Jamaica. See <http://www.carec.org/data/comm-dis/00wks1-12/index.html>.

3.7. Insights from Gravel Hill: water use priorities

The Rural Water Project study that was referred to earlier, used a priority ranking, and elicited views from women, men, boys and girls on what they saw as the priority for water use. Most of the 1,500 residents of the Gravel Hill community access water from rivers and from an irrigation canal which runs through the community to bring water to the nearby sugar cane fields. A few households are linked to the National Water Commission's (NWC) system, but service is extremely poor. The NWC occasionally sends water by trucks to the few remaining paying customers. Many households have black plastic tanks which they fill by purchasing water or carrying it from the river or canal.

Some 50 percent of households use pit latrines and the remaining households have mainly pour-flush toilets. An improved water system is therefore a priority for residents for the reasons stated below by both men and women. The results, in Table 1, show that water for drinking, for animals and cooking were the three top priorities for women, while water for flushing toilets, cooking and drinking were the top three for men.

Table 1: Priority water use - men and women, Gravel Hill²¹

Priority	Rating by Men- Gravel Hill	Rating by Women- Gravel Hill
1	Flushing toilet	Drinking
2	Cooking	Giving to Animals
3	Drinking	Cooking
4	Giving to animals	Bathing, flushing of toilet, washing of hands
5	Bathing	Farming
6	Washing	Washing
7	Cleaning	Watering flowers
8	Plants	
9	Washing bike/bicycle/car	
10	Construction	

Source: CRMI Jamaica Case Study research (Vassell: July 2008)

The women's choices reflect the importance they place on economic livelihoods through the rearing of animals - goats, pigs, cows and poultry. Men were of the strong view that even in adverse conditions, all measures should be taken to ensure that toilets are flushed and bathrooms kept clean. Interestingly, they gave a high rating for the need for water in household tasks that they are not generally involved in, and also ranked fourth, water for animals. Women's priorities covered both reproductive and productive tasks and ranked fourth, water for bathing, flushing of toilets and washing of hands.

²¹ Barrett, B. (2005). Participatory Learning and Action Report for Gender, Water and Sanitation Project, p. 66

Extreme weather events of drought and flooding exacerbate the already difficult conditions described, especially in relation to access to water and sanitation and the quality of the natural resource. These would require priority attention to the use and management of water.

3.8. Lessons on water resources management

The discussion on gender and climate change in relation to water and sanitation must also include water management. This study draws on insights and lessons learned about water management from an analysis of the construction, operations and management of the community water project.

Water management: Both women and men are concerned with water management but for different reasons. Women were more concerned about water management in the home, in relation to the conservation and efficient use of water because they are the main water carriers. Women in Gravel Hill did not mention water for washing of bikes and cars as the men did.

Gender equality in employment from the water project: Women were concerned that they should also be beneficiaries of the jobs that were to become available with the construction of the water projects. In the case of the construction in two of the projects, there was some resistance to employing women for pipe laying and trenching. In relation to the two remaining projects which are to be constructed using mainly community labour, specific guidelines now state that all positions must be open to women and they should be encouraged to apply.

Equality in leadership and management of the project: Water Management Committees (WMC) are being put in place to run the business of the water projects. In the White horses, Botany Bay and Pamphret Development Benevolent Society (WBP/DBS), women make up 45 percent of members. These WMCs are made up of representatives of: the Benevolent Societies, public sector bodies including the MOWH, the Parish Councils, and civil society and private sector interests.

Conclusion: The case study shows that in addressing issues of climate change adaptation, the institutional framework for water resources management must become responsive to gender issues and that these issues must be reflected at all levels of governance in the water and related sectors. Importantly, the institutions that manage water resources must be transformed to include men and women from the affected communities as equal partners in decision-making. It is in their interest that 'development' is being justified.

4. Gender-related vulnerabilities and capacities: conclusions and lessons from communities' testimonies

“is like the rain fall one time and wash away everything and the sun come and bun up everything”...Somerset Male Farmer - July 2008

Vulnerability takes into account the extent to which men and women are susceptible to loss as a result of their exposure to physical, social, economic and environmental factors. It is also linked to processes which make individuals, communities and nations more susceptible to the impact of hazards.

4.1. Vulnerabilities

4.1.1. Gender and vulnerability to climate change

Living within SIDS of the Caribbean increases the vulnerability of all interest groups and sectors to the impact of disasters, notably hurricanes. Climate change conditions do, however, interact with pre-existing systems of vulnerability to aggravate the conditions that poor women and men face in our communities and region. Climate change also impact the sustainability of livelihoods which are basic to human security. Pre-existing gender roles exacerbate these vulnerabilities.

4.1.2. Gender and vulnerability from drought and heat

Climate change negatively impacts food security and the situation with water and the agricultural sector is a case in point. While the climate of Jamaica is generally favourable to the production of export crops like sugar and bananas, and to domestic cash crops, including vegetables like carrots, the study on agriculture undertaken for the UNFCCC concludes that it is **‘the climatic variability and extremes experienced in Jamaica, in terms of tropical storms /hurricanes and the occurrence of drought that presents the main climatic challenges to agriculture in Jamaica’**.²² This observation is verified by one Somerset informant who remarked:

“First time you would see dry time from say January, February to April; rain from May. You could even expect the full moon to bring some rain. Not so now-a-days...the drought season is on and on.” Somerset male.

²² Enabling Activities for the Preparation of Jamaica's Second National Communication to the UNFCCC: Vulnerability and Adaptation Assessments Work Package 2: Water Resources and Agriculture. Working Paper. Undated, p. 36.

Understanding who grows what provides insight into the vulnerability of women to climate change related to drought and heat. Drought for example, is cited by 73 percent of respondents in TEA cluster as being the most severe disaster episode that they have to confront. Although some 43 percent of persons reported having water sources near their farms, supply of water in the quantities needed to irrigate farms is inadequate. Some farmers have to depend on rain-fed agriculture or they take steps which further destroy the environment by reducing forest cover and aggravating the incidence and impact of climate change. Women tend to have smaller lots which may be scattered in various locations rather than concentrated in one place and this increases their workload or the cost of accessing water when there is a drought.

4.1.3. Gender and vulnerability from the use of hybrid varieties which increases water demand

Drought and more challenging access to sources like rivers are, in the case of Somerset, both a consequence of climate change and of 'man-made' interventions. There is greater dependence of local farmers on genetically modified (hybrid) imported seeds (e.g. corn and carrots) and these seeds increase dependence on and demand for fertilizer applications without which, farmers assert, the crops will fail.

“the hybrid seeds dem a sell now and that need water and fertilizer and spraying. When you spraying you have to pad a donkey and make 4, 5 trip...there is more pressure on the women for that kind of labour... you have to pay,” a female farmer complained.

According to farmers, the abandonment of native varieties of seeds and their replacement with foreign hybrids add to the demand for water for irrigation. However, research needs to be done to determine what other impacts the new hybrids have on national food security and on the prospects for developing seed banks of local varieties. The high cost of fertilizers and women's lower income status means that women are less able than men to afford the cost of fertilizers and the water that are essential to produce high yields from their crops.

4.1.4. Gender and vulnerability from access to irrigation water

Lack of or inadequate irrigation is also a big challenge. The problem of irrigation was raised in Gravel Hill, one of the pilot areas under the Rural Water Programme. Here most residents reported that they have no choice but to use the irrigation water from the canals for domestic purposes with all the attendant health consequences. However, while irrigation water is available, water for farming still presents a problem for the majority of farmers and for women in particular. Use of canal water for domestic purposes increases the workload for women, as they have the main responsibility of caring for children and sick family members.

Many men and women carry water from the river for farming. Those who have to farm large acreages are mainly the men and often they are in some proximity to the water source, but accessing water from the river is tedious and often requires use of a pump for efficiency which is costly. According

to an officer of the Benevolent Society, speaking at a Gender and Water Workshop in 2005, “those who use the water supplied by the National Irrigation Commission (NIC) are not at the bottom of the poverty line. On the other hand there are those who can’t touch that because the unavailability of land is a problem.”²³ The cost of pumps and pumping water would also have adverse cost implications for women because of their lower income earning status.

Membership of the Water Users’ Association which has been set up by the NIC requires that the applicant must show proof of ownership or lease of land and tax receipts from the Inland Revenue Department. This will clearly exclude the vast majority of small farmers, and women in particular who generally have less access to and ownership of land.

All these challenges make farming in the context of global warming a more risky enterprise for the already beleaguered small farming sector. The situation is especially risky for women who, as farmers, face additional barriers to production, including high labour costs.

4.1.5. Gender and vulnerability from loss of forest cover

As a consequence of drought and heat, the men of Somerset have taken to the cooler regions and have cut down the trees to plant carrots, resulting in loss of forest cover and flooding (See Appendix 1).

In Somerset, the trauma of the flooding in 2005 will not be easily forgotten:

“the whole hillside come down...tons of dirt and water....men cut trenches, cut down trees to block the mud and try to channel it from the houses, they roll old buses to block the mudslide, but five houses were buried ...see you can see the top of one of them.... flood water come up to the electric wire... the bridge bruk [broke] in two...the district was cut off, is helicopter had to come with food and supplies.” (Male informant, July 2008)

The roof of this buried house, barely visible, is a grim reminder of what could happen again.



²³ Barrett, B. (2005). Participatory Learning and Action Report for Gender, Water and Sanitation Project, p. 72-73.

Residents consulted, reported since the forest cover has been depleted the district has become hotter. The water source which was closer when they farmed in the valley, cannot serve their present location. Farmers in the community are now seeking water from the upper reaches of the river in the hills, but this is not an easy solution and would be very costly. Farmers are aware that it is their own actions that have damaged the forest, and that threaten their homes and livelihoods. They would like to do a programme of re-forestation and return to farming in the valley, but this would need a major irrigation solution, so the situation continues. As floods become more prevalent, the loss to agriculture and to livelihoods increases.

4.1.6. Gender and vulnerability from hurricanes

The links between gender and vulnerabilities associated with hurricanes are drawn from lessons of Hurricane Ivan in Grenada and the responses of the residents in Jamaica consulted for this case study. Both show some common features.

a. Lessons from Hurricane Ivan in Grenada²⁴

The UNECLAC report on the differential impact of Hurricane Ivan on men and women in Grenada published in February, 2005, showed the economic, social, environmental and political impacts of hurricanes from a gender perspective.

The UNECLAC report highlighted the following

- **Women face special challenges in shelters such as poor security and lack of privacy.** Women and children tended to occupy the shelters more than men and in one instance two women were found in a shelter with 22 children.
- The impact of using schools as shelters slowed/interrupted children's education and increased women's child care responsibilities. The situation also represented a stressful period of dislocation for families in the shelters.
- Women's unequal position as land owners placed them at a disadvantage for reconstruction of homes after hurricanes. This was because most relief agencies provided building supplies to persons who owned lands and could provide titles. Many women did not have access to legal titles for land even in instances where they lived on family land, as the titles were often given to the males in the families.
- Men, because of the gender division of labour had greater access than women to the labour market after the disaster because they possessed skills needed for reconstruction of damaged housing.

Dynamics of vulnerabilities and capacities

The foregoing factors show that gender influences the vulnerabilities and capacities and as well as the circumstances of how hurricanes impact women and men because of differing gender roles and the gender division of labour.

²⁴ UNECLAC (2005). Grenada: A Gender Impact Assessment of Hurricane Ivan - Making the Invisible Visible.

b. Lessons from Jamaica

The section below looks at the situation in the communities studied in Jamaica. Table 2 presents data from the draft Position Paper of the UNFCCC which shows the direct economic loss to domestic crops from hurricanes within the past decade.

Table 2: Estimates of direct loss to domestic crops production

Hurricane/Storm	Domestic Crops- Loss J\$
May 2002 Flooding	J\$351 million
Hurricane Ivan	J\$199 million
Hurricanes Dennis & Emily	J\$112 million
Hurricane Wilma	J\$206 million

Source: Adapted from UNFCCC Position Paper, p. 37.

The figures mirror various forms of devastation that farmers face: crop damage and loss, erosion of land, loss of animals, destruction of chicken coops and loss of birds, absence of clean water to tend animals and the damage and destruction of housing. Unfortunately sex-disaggregated data on the losses to men and to women were not available.

c. Lessons from the rural communities

Damage to infrastructure affects both men and women badly. However, women's lower economic situation made them more vulnerable. Women who were traders had to pay more to transport their goods to the market. Those who were in farming also faced the high labour costs to rehabilitate their farms as they had to hire additional workers. So when infrastructure was damaged it had a severe impact on existing livelihoods of both men and women but women were more vulnerable as the disaster also reduced their ability to re-enter agricultural production.

Damage to roads and bridges also meant that men, women and children had to walk long distances instead of using transportation. This posed particular risks to women's safety when they had to walk home at nights from work. This reality was a deterrent to some women who wanted to access work outside of their communities.

Men also faced vulnerabilities and risks from damaged roads and bridges. When farm roads were destroyed, men (the majority of farmers), faced risks from crossing flooded rivers. They also faced risks from landslides as they went to tend their animals and tried to keep them alive.

In Somerset there was devastation in the hills where residents farmed. Roads and tracks that were damaged had to be rebuilt by the men. Sometimes the roads were even too narrow for the donkeys, so the loads of the donkeys had to be carried by the men which posed a risk to the men's health.

4.2. Gender division of labour related to hurricanes in the Jamaican communities

According to the Somerset residents, when the announcement of a hurricane comes, men and women know what to do. The women and bigger children take responsibility for collecting the water for household use and containers are identified to catch rain water. Sometimes the household has to relocate to safer shelter (usually someone's home), so the women pack clothes, papers and other items in plastic, and secure other household valuables.

The men focus on: securing the premises, such as, nailing down roofs, cutting back trees, securing the animals and fetching food from the fields, if available. Women without male partners or men in the households are severely challenged to provide for their children. Women also have to depend a lot on the general help of men in the community and this is available and freely given. As one female resident said, "man and woman come together and help...all man wey no talk to you will just jump in an help. And man will help out with the cooking and house work more time too." (Interview: July 2008).²⁵

Feedback from the residents suggests that while disasters do not erode gender defined roles and responsibilities, they seem to make them more fluid in the sense that men seem more open to 'help' in the tasks traditionally conceived as being the responsibility of women, and that they do indeed share in cooking, cleaning (to some extent) and care of children. This change must not be overestimated for the women say that although the men will help with the initial cleanup of mud, it is the women who must fetch water from the river for the cleaning and the everlasting washing and rehabilitation of the household. The changing roles caused by a disaster means that there is a space for conversation and measures to make changes that result in greater equity in the management of natural hazards.

Findings from the case study suggest that as long as the gender division of labour remains unchallenged, the massive operations undertaken by women in preparing for a hurricane and in rehabilitating the household afterwards, will continue to take on a certain 'logic' of 'naturalness'. The scale, burden and inequity of this responsibility will also continue to be masked. Yet, looking more closely and beyond the household, disasters and climate change impacts do not mask the vulnerabilities that are linked to women's condition and position in society.

²⁵ "Men and women come together and help. Even men with whom you are not on speaking terms will quickly come to your assistance. Men will also help with cooking and housework".

4.2.1. Economic vulnerabilities

The results of the consultations with residents in the communities show the impact of disasters:

Increased time spent on unpaid work

- In times of flooding, women spend more time searching for water in times of drought, and in water storage and purification in times of flooding. This reduces the time available for pursuing opportunities for productive work;
- When there is a hurricane, women's workload increases as they have to prepare for and clean up after the event. This is in addition to attending to their usual tasks.

Loss of assets and resources

- Farmers lose food security and resources when hurricanes or floods destroy their crops, animals and agricultural inputs;
- Damage or destruction of homes, furniture and other household assets reduces the standard of living of women and their families and these assets may be very difficult to replace.

Opportunities for productive work are reduced or destroyed

- Women, like men, may be forced to abandon economic activities because of damage to infrastructure. For example, they may have to give up farming because of the destruction of roads;
- Relocation to new surroundings for safety, e.g. to shelters, can disrupt economic enterprises;
- Contaminated water supplies from droughts or floods may threaten business activities such as food preparation or hairdressing and can result in reduced income;
- Most women do not have the requisite construction skills to repair their own houses and must often wait on help from men to do basic repairs;
- While these effects are not gender specific, they have a deeper impact on women because of the high levels of dependency of children and other family members on female headed households in particular.

High costs for business (re)development

- Women face recurrent and increasing costs for labour to rehabilitate farms after the destruction caused by hurricanes;
- With limited ownership of land women face difficult collateral requirements for credit.

4.2.2. Social vulnerabilities

Education

- Water scarcity means that children may spend more time fetching water and this affects school attendance and punctuality which, in turn, adversely affect performance;
- The use of schools as shelters can affect the operation of the school and therefore school attendance. Sometimes schools are damaged and require repairs which delay the operation of the school. The longer children are out of school, the greater the pressure this places on women.

Health, sanitation, hygiene, safety and dignity

- When there is a drought, the limited water available affects women's ability to manage personal hygiene, particularly if they are menstruating;
- Damage and destruction of toilets resulting from hurricanes and floods result in limited access to safe and convenient sanitation. This leads to stress, insecurity and loss of a sense of dignity, as women often have to 'take to the bushes', to defecate and urinate;
- Men face increased security risks as they have to undertake hazardous tasks related to the rescue of persons, the felling of trees and attending to their farms;
- Older men living on their own face particular risks, as in many instances they have weak familial ties and face neglect in times of disasters.

Conflicts, gender-based violence & cultural norms

- Conflicts arise between women and among families due to crowded conditions in shelters;
- Women and girls face sexual abuse in shelters;
- Men's propensity to drink and smoke heavily to relieve stress is injurious to their health. These practices may increase when there is a disaster. Poor coping strategies are also sometimes manifested in an increase in domestic violence directed towards women;
- Ideas about what are considered appropriate occupations for women and men and the limited support for women to access 'non-traditional' training, meant that women were not as 'free' as men to participate in the WROC/UNDP roofing project after Hurricane Ivan. The WROC/UNDP rehabilitation project opened the way to train a number of young people for employment.

4.2.3. Political vulnerabilities

Community governance structure

Where community organisations are weak and local leaders are not in place to liaise with the official disaster management authorities, communities affected by the impact of natural hazards can be bypassed for receiving support for relief and rehabilitation support. This can severely affect vulnerable groups such as the elderly, children, women and persons with disabilities.

4.3. Capacities

Discussions on capacities in relation to disaster mitigation and climate change adaptation are concerned with people's aptitudes for creativity, adaptability and problem-solving. The issues relate to how men and women cope as they face challenges in their personal lives and in their communities. The issues also relate to the systems of management, the networks and the relationships that are developed and utilised to create an enabling environment for the various actors to respond to challenges. Lessons learned are summarised below:

Household level

- Men seem more open to step out of traditional gender roles to participate in cooking, cleaning and child care activities. This creates a space for conversation and moves towards more sharing of housework and reducing women's work-load.
- Women's domestic roles and skills form the foundation for creating family support systems, for example: around child care, care of the elderly, cooking etc.
- Women have and use the capacity to 'turn dem han mek fashion' (i.e. to be creative), in order to feed their families on meagre resources, when these are available.

Community management roles

- Women participate in community networks and use other measures to address disaster preparation and response in a collective manner. In the present case study, these networks extend beyond the immediate communities and involved links with local and national organisations in civil society and the public sector. The experience showed that women's community management roles had expanded. For example, women in Botany Bay and Mt. Vernon in TEA, established and managed community shelters during Hurricane Dean.
- The case study showed that men's contribution to voluntary work in the communities had also increased.

Education and skills

- Women's higher level of literacy in Jamaica placed them in the forefront to access training that would be critical to support economic coping strategies.
- However the wider skills set of men in farming and construction gave them the advantage in accessing opportunities for immediate employment in housing and rehabilitation projects as part of the emergency response.

5. Adaptation strategies and measures

This case study on Jamaica has helped to identify several adaptation measures and strategies that are relevant to general disaster mitigation and climate change. The strategies and measures that are linked to domestic water use and agriculture, point to the need for additional research to identify gender-sensitive issues relevant to water and irrigation, watershed and coastal management, and fisheries, for example. This type of continuing research and action must inform Jamaica's work within the country's commitments under the UNFCCC.

The measures and strategies observed, classifiable in terms of community management, sustainable livelihoods and social responsiveness issues, have the effect of building personal and community resilience.

Michael Witter in his 2007 Environmental Foundation of Jamaica (EFJ) Lecture posited that in the Jamaican (and Caribbean) context, strategies for adaptation should revolve around changes such as: consumption patterns of energy and water and changes in our agricultural practices. He added: "All the changes will need to be guided by an appropriate policy framework that is formulated and implemented by a genuine partnership among the public sector, the private sector and civil society."²⁶ This is where we want to begin the analysis of adaptation measures and strategies, with the political framework anchored in commitment to community management.

5.1. Community management: foundation of adaptation strategies role of community-based organisations

Civil society bodies, notably Community Based Organisations (CBOs) and non-governmental organisations (NGOs), have been identified as key actors in the communities which have featured in the case study. These have included the following organisations in St. Thomas, St. Mary, Clarendon and Kingston:

- i. The TEA which is a farming circle which has an organised base in Trinityville, St. Thomas and serves as a point of contact for farmers with the public sector, RADA and other partners;
- ii. The Somerset Citizens' Association which is affiliated with the TEA but is a broad based organisation, dealing with farming, environmental and other development issues for the community;
- iii. The Mt. Vernon Women's Group, also located within TEA, and bringing together the female chicken farmers;

²⁶ 5th Annual Public Lecture by the Environmental Foundation of Jamaica, Climate Change and Jamaica: Sustainable Development as Strategic Adaptation. Presenter, Dr Michael Witter, Snr. Lecturer, Department of Economics,

- iv. The WBP/DBS. This is part of a network of three other Benevolent Societies involved in the Rural Water Programme of MOWH towards piloting community water projects. It has done extensive work on community sanitation and chicken rearing through grant funding from various sources;
- v. The Mile Gully/Warwick Castle Development Benevolent Society, in St. Mary, is also a developing community water organisation. Like its counterpart in St. Thomas, the Society is undertaking other economic and social community development initiatives alongside its focus on water and sanitation;
- vi. The Gravel Hill Development Benevolent Society is located in Clarendon and has the peculiarity of sourcing water from an inefficient system of the NWC, from rivers and from irrigation canals. It presented a case for the treatment of irrigation water for domestic purposes. The acceptance of this proposal, resulting in the redesign and of the community water system, represents a major achievement for the Society;
- vii. The (WROC), a 25 year old NGO based in inner-city Kingston, mobilises grant funding from organisations such as Christian Aid and inter-governmental organisations like the United Nations Development Programme (UNDP) to implement programmes with CBOs. These projects are focused on sustainable livelihoods which came out of a hurricane response project. They have now expanded to include a broad community development agenda, including capacity building,;
- viii. The MOWH is spearheading the Rural Water Programme (RWP) as a pilot to provide water to rural areas through community management. The Ministry works with the Benevolent Societies towards this new modality in water resources management.

These organisations, in varying ways, support the mandate to deepen community management as a key strategy for sustainable rural development.

5.2. Building community management frameworks

Women are strongly represented in the leadership of the community based organisations and therefore influence the design of livelihood programmes and the allocation of relief and rehabilitation benefits in the field. Under the initiative of WROC these CBOs have formed the **Rural Livelihoods Cluster (RLC)** to work in collaboration with WROC in directing the work in the portfolio. The **Rural Livelihoods Cluster (RLC)** represents leaders from all collaborating CBOs in St. Thomas as well as public sector bodies responsible for specific aspects of the Sustainable Livelihoods agenda. These include: RADA, the Forestry Department, and the Public Health Department and others.

This community management framework of the RLC therefore:

- Serves as an organising centre for voicing community concerns and securing local community interests;
- Facilitates links and cooperation among CBOs in the parish around common livelihoods issues, for example, administering of the small grants;
- Facilitates direct collaboration with NGOs, and with public sector bodies inside and outside the parish. For example, the CBOs are now formally regarded as part of the network within the national response system of the Office of Disaster Preparedness and Emergency Management (ODPEM);
- Fosters links directly and indirectly with international organisations;
- Serves as a platform for capacity building, including training of local leaders;
- Serves as the organizing base for programmes that support disaster response measures. This base has the capacity to expand the scope more directly into climate change mitigation and adaptation measures.

The NGOs and Intergovernmental Organisation (IGO) collaborators outside the communities have worked with existing CBOs and have not formed any new groups of their own. However, while the support being given is gradually building the capacity of the local CBOs, the real challenge is to be more consistent and effective in building these local organisations to participate in the national risk management strategy and to bring gender analysis more centrally into their approach.

5.3. Economic measures and strategies

- Women farmers received a special grant to help with the cost of labour for farm rehabilitation;
- A small revolving loan scheme, funded by Christian Aid, was initiated by WROC in collaboration with the RLC, that benefited about 30 farmers;
- Community nurseries in two cluster communities are being piloted. Cash crop seedlings are grown and sold to residents. When hazards threaten, the seedlings are secured and are available after the hurricane for quick re-planting which enables the farmers to earn more, based on the scarcity of the particular commodity;
- A model chicken house project, developed by RADA, is being implemented through grants to a few women in various localities. These have proved resilient to storms and, although expensive, are good long-term investments in 'backyard' chicken production;

- Some female farmers have expressed an interest in diversifying their economic activities, for example, adding honey production to their backyard farming and chicken operations;
- Women's economic activities have changed. For example, in St. Mary some women have left their farming communities and their traditional jobs on the farms to seek other employment as domestic workers, security guards and hotel workers.

5.4. Social measures and strategies

Capacity building

Community members have participated in sensitization and training that address a wide range of issues including disaster mental health, water sanitation, hygiene, and conflict management. A two day training on Initial Damage Assessment, conducted by the ODPEM and WROC, saw some twenty three community members, mobilized through RLC participation. (See Appendix II for a report, published in the Sunday Gleaner).

'Day for day'

Another way to ease the pressure and burden off their households has been the use of a traditional African-derived practice of pooling labour (the traditional 'day for day' method). This popular strategy is used among farmers. Men come together to do repairs, help to provide relief support throughout the community and to rehabilitate their farms. Women will normally do the cooking for these events.

Men will pool their efforts to provide labour for women, but the beneficiary has to provide food and refreshment which itself can be costly.

Resource mobilisation

Benevolent Societies, notably the WBP/DBS, mobilized resources to improve sanitation in communities and to undertake other development initiatives.

Establishment of a community shelter

In Botany Bay this was done under the aegis of the WBP/DBS in partnership with the Red Cross and the Parish Disaster Committee of the ODPEM.

6. Conclusions and lessons learnt

6.1. Conclusions from the case study

- The different jobs and tasks that men and women have, based on the gender division of labour, are reinforced but also altered by disasters and the emerging situations brought different risks and opportunities to both sexes;
- There are differences in men's and women's access to resources such as water, land and social networks. Climate change impacts and disasters present them with different options and possibilities for coping;
- Men and women have different types of knowledge and different skills based on their distinct roles in society. These different knowledge sets do influence how each group responds to climate change and disasters;
- There are differences in men's and women's access to decision-making structures but also in how people in rural communities participate in national structures. The study showed how the participation of ordinary people can be expanded and how women can participate more effectively in decision-making about water and climate change.

6.2. Lessons learned from the case study and recommendations

Gender sensitive measures must be integrated into climate change adaptation strategies linked to water and sanitation. These measures must respond strategically to **women's disadvantaged position vis-à-vis men**. Development planners must take account of the reality that women may have: less access to resources, a double burden of reproductive and productive work and less access to power and decision-making. The culture of exclusion from areas such as construction skills which are needed after a disaster, undermines women's life chances.

It is therefore recommended that greater focus be placed on:

- Provision of potable water and improved sanitation to rural communities;
- Securing land resources specifically for women;
- Supporting food security by adopting measures to expand women's role in agriculture.

Community organising must become more integrally linked to strategies for disaster risk reduction and climate change adaptation.

Capacity building for CBOs must become more central to disaster management and ongoing climate change adaptation strategies. Support must be given to strengthening CBOs as well as to

improving women's position of leadership within CBOs. Capacity building of CBOs must include: establishment of new groups where there are gaps; training to strengthen existing CBOs; and broadening networks to support collaboration between NGOs, public and private sector bodies, and international donors.

Community early warning systems must be implemented in a manner that secures community support and must be equally accessible to women and men. Men must also be encouraged to give priority to securing life over securing property and other assets which place them at risk.

Special consideration must be given to women's interests in disaster mitigation efforts to lessen the impact of disasters on them. The physical safety and protection of women and children in emergency shelters need special attention. The modalities selected to address sanitation as part of emergency management strategies must be more gender-sensitive.

Gender and community risk management are central to development. These issues must therefore become more integrated into the work of risk management agencies and into the entire framework of sustainable development planning.

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Appendix I - Climate change impact: a farmer's perspective

Gambling with the soil published: Sunday | 10 August 2008

Avia Collinder, Sunday Gleaner Writer

CLIMATE CHANGE is one term with which even the smallest of small [farmers](#) in St. Thomas should now be familiar. Joan Buchanan, a 53-year-old farming veteran, knows this as intimately as she knows when her bananas are market ready.

Buchanan remembers the years when she could set her pot on the fire from predictable earnings of her work and send her children to school dressed in 'good clothes' too.

But, in recent years, with hurricanes producing frequent rains, floods and blistering heat, farming is a gamble worse than buying the games that people play, Buchanan says.

When [The Sunday Gleaner](#) - in late July - visited her farm, located on a few acres outside of Seaforth, the callaloo was spotted with white fly disease as was the gungo, which otherwise would provide a sure [income](#) for the Christmas season.

She laments the heat that sucks life from her hungry plants and the periodic rain which floods her plot. "The other day, I planted tomato and sweet pepper and I lost both - between the rain and the sun. The last rain blighted the cucumber," Buchanan recounts.

With no irrigation on her farm, the only plant she can afford to water when the dry time comes is the callaloo.

Nkrumah Green, technical adviser attached to the Women's Resource and Outreach Centre (WROC), which provides small farmers in 11 St. Thomas communities with material and technical assistance, says that climate change and the loss of tree cover makes farming a worse gamble than it ever was.

Climate change brought on largely by global warming, results in increased incidence of hurricanes, floods and other natural disasters. Usually, periodic flooding alternates with the onset of drought.

In addition to hurricanes that come more frequently, small farmers themselves are also part of the sad tale of this change.

Having no system of irrigation and desperate for cooler lands for planting, residents strip the hillsides of trees. When it rains, top soil is stripped from the unprotected lands, blocks the drainage systems and flooding occurs downstream.

Buchanan's land is periodically flooded, washing away her expectations with them. This year, she had more hope than usual, having received a small loan from WROC to pay a male labourer to assist with crop production.

In good times, her land yields sweet pepper, okras, callaloo, and tomatoes, which are [kitchen-table](#) perfect. But the heat and periodic flooding this year are costing her too much.

"I was expecting to reap a crop (callaloo) next weekend," she moans. "But now, it is bored (full of holes) and nobody wants it like that."

Buchanan recalls too that both hurricanes Ivan and Dean meant starting everything over again. Now that the callaloo crop is devastated by disease, she will have to plant again.

Her biggest problem, Buchanan says, is that the land is not owned by her - most of it is leased. If she owned the land, she reasons, "I would plant tree crops like soursop, ackee, coffee, so later when I can't labour anymore, I could help myself".

With her land title, she would also be able to get the loans to install irrigation and make other seasonal inputs which are needed. But this also, for now, is another pipe dream.

WROC aid

Instead, she depends on organisations like WROC, which cover the costs of back-breaking labour. Admitting that none of her three children is interested in farming, she explains: "Farming is a rough calling. You plant the crops and it's a gamble."

Buchanan still has high hopes this year for the gungo and several thousand pounds of sorrel she has also planted. That is, if no hurricane or flood should come this year to drown the plants and her expectations along with them.

She despairs of getting help from government agencies, although the voices about food security are loud.

"If you are not deep into the politics, if you don't mix up in it big time and have a godmother or a godfather, there is no help for you," Buchanan comments.

Appendix II - Adaptation measures and strategies - training

St Thomas prepares for disaster

published: Sunday | 13 July 2008

Shelly-Ann Thompson, Staff Reporter

In Sommerset, St Thomas, home-wrecking landslides during hurricanes and heavy rains are as predictable as the daily sunset.

So when 28-year-old Stacy-Ann White, a teacher living in the community, heard about a way of preparing for hurricanes - with the hope of lessening the damage - she was quite determined to know more. She invited her neighbours too.

In the first week of June, farmers and other community members from Trinityville, Font Hill, Whitehorses, Botany Bay, Pamphret, Johnson Mountain, Taris and Spring Bank in St. Thomas, participated in a two-day 'Initial Damage Assessment Workshop' hosted by the Office of Disaster Preparedness and Emergency Management (ODPEM), and the Women's Resource and Outreach Centre.

Twenty-one females and three males were introduced to risk analysis, risk reduction, adverse-event management and the recovery-mitigation programme.

"They taught us how to prepare for a natural disaster. If a disaster should occur, there are ways and means to prepare, things to do and not do," Lenford Brown, 38, farmer and plumber of Trinityville in Western St. Thomas says. "We were also taught how to grade buildings for damage and how to reduce vulnerability."

Overview of management

The seminar also addressed the effects of hazards, how to conduct an assessment, as well as an overview of the national disaster-management programme. "What I learnt was about evaluating persons' houses," reports Stacy-Ann White. "We did a search and rescue. We were also taught resourcefulness; if we don't have something, use something else."

She adds: "We also learned to put a team together to clear roadblocks and how to get a list of everyone in the neighbourhood before an actual disaster."

Sommerset residents were also taught how to put together a mitigation team, do first aid, carry out damage evaluation to determine the amount of assistance needed, and how to identify sources of financing.

Appendix III - Climate change: manifestations and gender impact

Climate change phenomena	Some general risks	Some water & sanitation related risk	Gender impact
Climate variability-extreme weather events - Heat and drought	Burning of crops Loss of crops, & poultry Loss/reduction of income Soil damage due to fertilizer residue Fertiliser use for production of genetically modified seeds, e.g., corn.	Drying up of water sources; reduction of water flow; less water for domestic and agricultural purposes Increase in contamination of water in rivers and stream. Increased pressure for water for irrigation. Water source contamination	Cost of buying and transporting water for domestic use Increase in workload for women; more time spent use at standpipes- go to river less and washing 'piles up' Higher costs of production for women, especially from additional labour costs. Increased economic demands on households; burden on women and children; more time used by women to purify water for drinking;
- Heavy rains/flooding	Soil erosion Landslides Destruction/ loss of homes & furniture infrastructure/ roads Loss/destruction of agricultural output, livestock and income Food scarcity & insecurity	Damage to/loss of toilets Scarcity of potable water Water borne diseases occur in some areas.	Hygienic conditions threatened- illness of children & elderly increases brings burden on women Women's & girls' dignity and security threatened by poor or no toilet; Women's & men's income sources threatened- harsh implications for female headed households. Diet of population compromised- harsh implication for children and elderly, pregnant and lactating mothers.
Storms/ Hurricanes	Roads, bridges damaged/destroyed; water & electricity		Increased vulnerability for children, elderly and women.

	<p>locked-off; communities isolated- health & security risk</p> <p>Houses destroyed, damaged</p> <p>Rotting of dead animals threaten health</p> <p>Overcrowding in shelters, safety threat to vulnerable population</p> <p>Overflowing of rivers.</p>	<p>Not enough water for domestic use</p> <p>Higher fuel & time costs for water access and purification</p> <p>Threat of disease outbreak; increase in vectors; contamination of sources from dead animals etc</p> <p>Sanitation & hygiene compromised</p> <p>Land degradation; lives at risk.</p>	<p>Increased work load for women.</p> <p>Men and boys prone to risky behaviour to check on animals.</p>
Loss of Forest Cover	<p>Land degradation</p> <p>Encroachment on forests for farming</p>	<p>Climate change effects exacerbated – reduction in rainfall, heat, landslides etc.</p>	<p>Men move to higher forest regions for farming; women often have to abandon farming due to problems of distance, access, higher costs for transport and labour.</p>

Source: CRMI Jamaica Case Study Research (Vassell: July 2008)



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