Government of Saint Vincent and the Grenadines

Road Map

toward

Integrated Water Resources Management Planning

for Union Island, St. Vincent and the Grenadines

draft

Prepared by the Caribbean Environmental Health Institute
P.O. Box 1111, The Morne, Castries, ST. LUCIA

In partnership with the
United Nations Environment Programme Collaborating Centre for Water and Environment
and the
GEF-funded Integrating Watershed and Coastal Areas Management Project

May 2007

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Executive Summary

The World Summit on Sustainable Development (Johannesburg, 2002) and the resulting Plan of Implementation (JPoA) called for all countries to develop integrated water resources management (IWRM) and water efficiency plans by 2005. These plans will contribute to the foundation towards achievement of targets set out under the Millennium Development Goals as related to poverty, hunger, health and environment issues.

To date no Caribbean Governments have finalized IWRM Plans and a partnership of regional and international technical agencies are assisting in this regard. In St. Vincent and the Grenadines the IWRM planning process is being assisted by the Caribbean Environmental Health Institute (CEHI), the United States National Oceanic and Atmospheric Administration (NOAA), the United Nations Environment Programme Collaborating Center on Water and Environment (UCC-Water), the Global Water Partnership-Caribbean (GWP-C) and the Global Environment Facility-funded Integrating Watershed & Coastal Area Management (IWCAM Project).

Among the first achievements in development of national IWRM Plans is political and societal commitment to the process, and agreement on a process that will guide stakeholders through to development of the IWRM Plan. The path that will guide this process is referred to as a "Roadmap". The IWRM roadmap is therefore the planned steps toward realization of IWRM.

This material presented in this document is a Road Map for development of an IWRM Plan for Union Island, one of the Grenadine Islands that make up the country of St. Vincent and the Grenadines. Union Island was selected as a pilot to demonstrate the IWRM development process on a small water-scarce island that represents similar circumstances on islands in the northern Leewards, the Virgin Islands, the Bahamas and the Turks and Caicos Islands. Pressing issues related to water scarcity on Union Island include maintenance of health and sanitation and expanding water supply availability, particularly during severe drought periods.

The Union Island IWRM Plan roadmap elaborates 9 key Action Areas that need to be undertaken:

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1. Process initiation;
2. Steering Committee (SC) establishment;
3. Process management team (PMT) establishment;
4. Stakeholder involvement plan development and implementation;
5. Communications plan development and implementation;
6. Situational Analysis and IWRM Plan Framework;
7. Vision Statement and Goals Articulation;
8. Evaluate IWRM Plan options;
9. IWRM Plan promotion, adoption and implementation.

It is anticipated that the IWRM Plan development process will run over a two-year time frame and will be participatory involving both public and private sector stakeholders from the mainland and Union Island. It is recommended that the Ministry of Grenadine Affairs and the Ministry of Health and the Environment provide leadership to the process. A costed summary of the actions is also presented as part of this Roadmap to guide the preparation of a financing proposal for development of the IWRM Plan.

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Acronyms

CEHI	Caribbean Environmental Health Institute
CWSA	Central Water and Sewerage Authority
ESU	Environmental Services Unit
EU	European Union
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GIS	Geographical Information Service
GOSVG	Government of St. Vincent and the Grenadines
GWP	Global Water Partnership
IWCAM	Integrating Watershed and Coastal Areas Management (project)
IWRM	Integrated Water Resource Management
mm	millimetres
NAP	National Action Plan
NEAB	National Environmental Advisory Board
NEMS	National Environmental Management Strategy
NOAA	National Oceanic and Atmospheric Administration
NRM	Natural Resource Management
OAS	Organization of American States
PMT	Process Management Team
RWH	Rain Water Harvesting
SC	Steering Committee
SGD	St. Georges Declaration of Principles for Environmental Sustainability
SIDS	Small Island Developing States
SVG	St. Vincent and the Grenadines
UCC	United Nations Environment Programme Collaborating Center on Water and Environment
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UWI	University of the West Indies

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Acknowledgements

The following persons are acknowledged in the roles they played in assistance in ground logistics, stakeholder consultations toward preparation of this Road Map document for implementation of IWRM planning processes on Union Island.

Alexia Cooke, Sustainable Grenadines Project

Anthony Bowman, Ministry of Planning

Ed Kruse, United States Department of Commerce, National Oceanic and Atmospheric Administration

Edmund Jackson, Environmental Services Unit, Ministry of Health and Environment

Edwin Snagg, Ministry of Grenadine Affairs

Fitzgerald Providence, Forestry Department

Henrik Larsen, United Nations Collaborating Centre for Water and Environment

Jacques Daudin, Union Island

Karen Salvini, United States Department of Commerce, National Oceanic and Atmospheric Administration

Kathleen Jack, Ministry of Planning

Katrina Collins, Union Island Environmental Attackers

Martin Barriteau, Sustainable Grenadines Project

Saville Lewis, Solid Waste Management Unit, Central Water and Sewerage Authority

Weston Stewart, District Officer for Union Island

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PART 1: Background and Scope

1.1 Context

In January 1992 some five hundred participants, including government-designated experts from a hundred countries and representatives of eighty international, intergovernmental and non-governmental organizations attended the International Conference on Water and the Environment (ICWE)[1] in Dublin, Ireland. Out of the Conference, the Dublin Statement was crafted, underpinned by four principles that laid the foundation for and basis for guiding the integrated management of the world's water resources. The principles are:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment;
- Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels;
- Women play a central part in the provision, management and safeguarding of water;
- Water has an economic value in all its competing uses and should be recognised as an economic good.

Agenda 21 of the United Nations Convention on Environment and Development (Rio, 1992) indicated in Chapter 18 the need for protection of the quality and supply of freshwater resources by application of integrated approaches to the development, management and use of water resources. Furthermore it exposed that integrated water resources management is based on the perception of water as an integral part of

[1] See reference on-line at http://www.wmo.ch/web/homs/documents/english/icwedece.html

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the ecosystem, a natural resource and a social and economic good, whose quantity and quality determine the nature of its utilization. A number of programme areas were proposed including integrated water resources development and management.

In 2002 the World Summit on Sustainable Development (WSSD) was held in Johannesburg, South Africa. Over 8,000 civil society participants representing NGOs, women, indigenous people, youth, farmers, trade unions, business leaders, the scientific and technological community and local authorities attended the Summit, to reaffirm the commitments made at the Rio Summit in 1992 and chart out a path for the future. Article 26 of the resultant Johannesburg Plan of Implementation (JPOI)[2] calls for all countries to: "*Develop integrated water resources management and water efficiency plans by 2005, with support to developing countries."* This was deemed as of utmost importance as an instrument to mainstream water in national economy and development and achieving the Millennium Development Goals (MDG´s) by 2015 specifically aimed at addressing the issues of poverty, hunger, health and environment. Those MDGs related to Water and Sanitation were:

- Halve, by the year 2015, the proportion of people without access to safe drinking water (reaffirmation of Millennium Development Goal).
- Halve, by the year 2015, the proportion of people who do not have access to basic sanitation.
- Develop integrated water resources management and water efficiency plans by 2005.

In the Caribbean region there has been steady progress towards the targets contained in bullets 1 and 2. However, no Caribbean states have developed the IWRM and water efficiency plans.

[2] For the full text of the JPOI, including the exact terms in which these commitments were made, visit the official website: http://www.un.org/esa/sustdev/index.html

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1.2 Issues of water security

There is no doubt that water is the most vital natural resource and all of life and life support processes are dependent on this liquid medium. Water is vital for human survival, health and dignity and a fundamental resource for human development. The finiteness of available water on earth is very discernible when we consider that of the 1,400 million cubic kilometres of water on earth and circulating though the hydrological cycle, only one-hundredth of 1% of this amount is readily available for human use (FAO, 2005). It is believed that this quantity is sufficient to meet humanity's needs if it were evenly distributed; however, this available 9,000 cubic kilometre volume is very unevenly distributed across the planet. In areas where the indigenous water supplies average less than 1,000 cubic meters per person per year, these areas are categorized as water scarce (FAO, 2005).

The amount of water available to each person is falling considerably as growing human populations continue to place tremendous pressure on diminishing water resources. Water scarcity is exacerbated by pollution. According to the FAO (2005), 450 cubic kilometers of wastewater pollute the world's surface waters each year reducing utility of these waters for safe human consumption. This not only has implications for human populations but also for the natural environment, offsetting the delicate balance of ecological systems, and in severe cases unleashing irreversible consequences which may have direct adverse socio-economic consequences.

This situation is of particular concern for developing countries and Small Island Developing States (SIDS) where nearly one-third of the population has no access to safe drinking water. The Caribbean region has the least water available per capita as compared to other SIDS regions; just 13.3% of that available in the Indian Ocean SIDS and 1.7% of that available in the South Pacific SIDS on a per-capita basis. The island of Barbados for

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example is ranked among the ten most arid countries in the world. The geomorphology of most Caribbean islands limits the physical availability of freshwater reserves on account of relatively small landmass areas and typical mountainous terrain. The impacts of relatively frequent natural disasters (hurricanes and floods) exacerbated by human activity compromise water supply systems for extended periods, placing populations at risk under water scarce conditions. The impacts of climate change on the climatic and water regime in SIDS cannot be underestimated and constitutes an additional threat to water security.

In the GWP/Cap-Net Training Manual and Operation Guide for development of Integrated Water Resources Management Plans (2005), key issues in national water resources management were outlined along with the merits of adopting an integrated approach to water resource management planning. These include:

Water governance crisis: The sectoral approaches to water resources management (WRM) lead to fragmented and uncoordinated development and management of the resource aggravating the increase competition for the finite resource. The importance of IWRM is that it brings coordination and collaboration among the individual sectors, plus a fostering of stakeholder participation, transparency and cost-effective local management.

Securing water for people: Deficiencies in water supplies primarily affect the poorest segments of the population in developing countries. In these countries, meeting water supply and sanitation needs for urban and rural areas represents one of the most serious challenges in the future. Implementing IWRM will assist in meeting the challenge of access to potable water, sanitary facilities and poverty alleviation.

Securing water for food production: Irrigated agriculture is already responsible for more than 70% of all water withdrawals projecting serious conflicts between water for irrigated agriculture and water for

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other human and ecosystem uses. IWRM offers the prospect of greater efficiencies, water conservation and demand management equitably shared among water users, and of increased recycling and reuse of wastewater to supplement new resource development.

Protecting vital ecosystems: The functionality and survival of our finite and vulnerable ecosystems depend on water flows, seasonality, water-table fluctuations and are threatened by poor water quality. Land and water resources management must ensure that vital ecosystems are maintained and that adverse effects on other natural resources are considered and where possible reduced when development and management decisions are made. IWRM can help to safeguard an "environmental reserve" of water commensurate with the value of ecosystems to human development.

Gender disparities: As custodians of family health and hygiene and providers of domestic water and food, women are the primary stakeholders in household water and sanitation. Hence, a crucial element of the IWRM philosophy is that water users, rich and poor, male and female, are able to influence decisions that affect their daily lives.

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1.3 Integrated Water Resources Management (IWRM)

1.3.1 What is IWRM?

Integrated Water Resources Management (IWRM) is a process of management of water resources use in a manner to sustain social, economic and environmental demands. The IWRM process recognizes that all the different uses of water resources are interdependent and therefore in planning processes all the different *uses* and *users* of water resources must be considered together. The *uses* of water are very diverse and ranges from drinking, to sanitation, to manufacturing, to agriculture, to recreation t name a few. The *users* include farmers, manufacturers, hoteliers, water utility companies, householders. Often not considered are ecosystems such as forests, mangroves and coral reefs, which not only use water to maintain their health but also to maintain the flow of benefits such as clean water and food for human use.

1.3.2 Principles of IWRM

The IWRM development process has been given priority attention in recent years by international and national agencies given the recognition of increasing water scarcity and problems associated with threats to human health and sanitation, ecological integrity and social and economic development. An International Conference on Water and Environment, Dublin, Ireland, January 1992 laid out four guiding principles that have been agreed on to provide the framework for water sector reform and resource management from the global to national levels. The Global Water partnership/Cap-Net Training Manual (2005) elaborates these principles:

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Principle 1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.

Understanding the finiteness of our water resources can be best done by appreciating the hydrological cycle. The notion that freshwater is a finite resource arises as the hydrological cycle on average yields a fixed quantity of water per time period. Thus, the freshwater resource is a natural asset that needs to be maintained to ensure that the desired services it provides are sustained. This principle recognises that water is required for many different purposes, functions and services; management therefore, has to be holistic (integrated) and involve consideration of the demands placed on the resource and the threats to it.

The integrated approach to management of water resources necessitates co-ordination of the range of human activities which create the demands for water, determine land uses and generate waterborne waste products. The principle also recognises the catchment area or river basin as the logical unit for water resources management.

Principle 2. Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels.

Water is a subject in which everyone is a stakeholder. Real participation only takes place when stakeholders are part of the decision-making process. The type of participation will depend upon the spatial scale relevant to particular water management and investment decisions. It will be affected too by the nature of the political environment in which such decisions take place. A participatory approach is the best means for achieving long-lasting consensus and common agreement. Participation is about taking responsibility, recognizing the effect of sectoral actions on other water users and aquatic ecosystems and accepting the need for change to improve the efficiency of water use and allow the sustainable development of the resource. Participation does not always achieve

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consensus, arbitration processes or other conflict resolution mechanisms also need to be put in place.

Governments have to help create the opportunity and capacity to participate, particularly among women and other marginalised social groups. It has to be recognised that simply creating participatory opportunities will do nothing for currently disadvantaged groups unless their capacity to participate is enhanced. Decentralising decision making to the lowest appropriate level is one strategy for increasing participation.

Principle 3. Women play a central part in the provision, management and safeguarding of water.

The pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. It is widely acknowledged that women play a key role in the collection and safeguarding of water for domestic and – in many cases – agricultural use, but that they have a much less influential role than men in management, problem analysis and the decision-making processes related to water resources.

IWRM requires gender awareness. In developing the full and effective participation of women at all levels of decision-making, consideration has to be given to the way different societies assign particular social, economic and cultural roles to men and women. There is an important synergy between gender equity and sustainable water management. Involving men and women in influential roles at all levels of water management can speed up the achievement of sustainability; and managing water in an integrated and sustainable way contributes significantly to gender equity by improving the access of women and men to water and water-related services to meet their essential needs.

Principle 4. Water has an economic value in all its competing uses and should be recognised as an economic good as well as a social good.

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Within this principle, it is vital to recognise first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Managing water as an economic good is an important way of achieving social objectives such as efficient and equitable use, and of encouraging conservation and protection of water resources. Water has a value as an economic good as well as a social good. Many past failures in water resources management are attributable to the fact that the full value of water has not been recognised.

1.3.3 What is an IWRM Plan and what does it aim to achieve?

An Integrated Water Resource Management Plan is the guiding framework for sustainable management and development of water resources. The development process for such a plan requires consultation with all users of the water resource to ensure that their requirements are adequately met within the quantities of water that are naturally available, or within the capacity to generate in the case of desalinization from the sea. The IWRM Plan also seeks to ensure that the water requirements to maintain health ecosystems (such as forests, mangroves, coral reefs) are also met. The IWRM Plan lays out how the stakeholders in the country will coordinate management of its water resources to sustainably meet the water needs of society, the economy and the natural ecosystems in an equitable manner. The IWRM plan is a *national-level* plan.

To summarize, an IWRM Plan aims to:

(i) heighten awareness and understanding of the value and benefits of integrated water resources management;

(ii) identify and implement actions to address specific causes of negative impacts and threats on human health and the environment;

(iii) mobilize resources and partners, including the private sector, for implementation of specific projects to address the negative impacts and threats on human health and the environment.

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1.3.4 The IWRM planning and implementation process

The IWRM development process is cyclical one. According to the Global Water Partnership (2005) the main phases of the planning process are:

Initiation: Triggers to start a planning process and agreement that improved management and development of water resources is important and necessary. This phase will allow for the synthesis of a team to organise and coordinate effort and facilitate a regular stakeholder consultation.

Visioning: Captures the shared dreams, aspirations and hopes about the state, use and management of water resources in a country. In that sense, a vision provides guiding principles and direction to the future actions about water resources and in particular guides the planning process.

Situation analysis: Define the actions needed to reach the vision and is facilitated by consultation with stakeholders and various government entities. This is vital to understand competing needs and goals in relation to the water resource availability. This phase elucidates the types of solutions that may be necessary or possible, identifies the strengths and weaknesses in water resource management, point out the aspects that should be addressed in order to improve the situation and guide the path for obtaining vision.

Strategising: Establishing the goals for the IWRM plan is important at this stage and the most appropriate strategy is selected and assessed for feasibility as well as its conformity to the overall goal of sustainable management. The scope for technical and managerial action is very large given the complexity of the water sector and already at this stage priority areas for action should be identified.

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IWRM Plan preparation: On the basis of the vision, the situation analysis, and the water resources strategy an IWRM plan may be prepared. Consultations at all levels will be required to get politicians and stakeholders to agree to the various trade offs and decisions made.

Implementation and evaluation: The legal, institutional, management actions and capacities built will create the requisite enabling environment for implementing the plan. However, achieving sustainable management and development of water resources is a long term commitment and therefore the plan should be seen as a revolving plan with features of evaluation and reformulation at periodic intervals.

The process is illustrated in Figure 1.

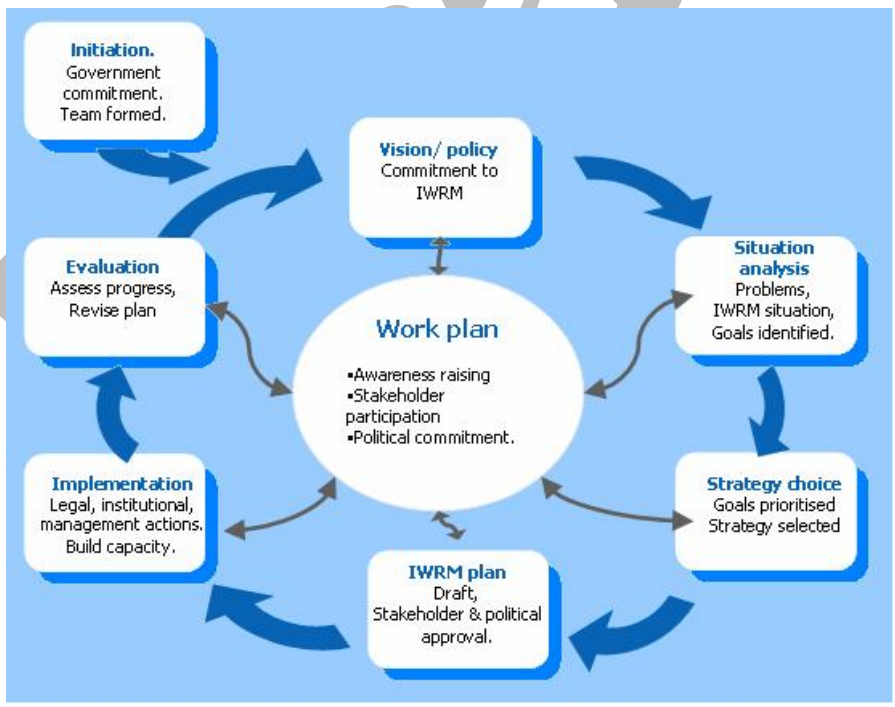

Figure 1. The cycle for developing and adjusting an IWRM Plan

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1.4 Recent IWRM development processes in the Caribbean

The regionalization of the IWRM planning process in the Caribbean was initiated at the Third Caribbean Environmental Forum held in Antigua in 2006 which was jointly hosted by the Caribbean Environmental Institute and Clean Islands International (Annual Wider Caribbean Waste Management Conference). A significant component of the CEF was the convening of a workshop on Integrated Water Resources & Coastal Areas Management in the Caribbean Region that was supported by the United Nations Environment Programme Collaborating Center on Water and Environment (UCC). The workshop was attended by representatives from water agencies and utility companies, ministries of water and environment, and technical resource agencies from across the region. Presentations were delivered by key resource agencies involved in water resources management in the region and internationally. Findings of a regional survey carried out by CEHI on behalf of the UCC on the status of national preparedness for IWRM was presented. Participants engaged in a visioning exercise to determine key strategic directions for IWRM in the Caribbean and set out follow-up actions by the regional partner agencies and local focal point agencies.

In December 2006 a meeting of an Informal Working Group on integrated water resources management in the Caribbean was held in Kingston Jamaica. The meeting sought to:

- Identify duplication and gaps in Integrated Water Resources Management (IWRM) Work Plans of participating agencies and Caribbean countries and territories.
- Develop a unified, strategic and coordinated Plan for IWRM in the Caribbean.
- Collaborate on obtaining political commitment to reform, in relation to IWRM plans.

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- Continue to identify methodologies to strengthen and promote partnerships and networking for the implementation of IWRM

The meeting was attended by representatives of the Caribbean Environmental Health Institute (CEHI) the Caribbean Water and Wastewater Association (CWWA), the Global Water Partnership – Caribbean (GWP-C), the Jamaican Ministry of Health, the Jamaican Water Resources Authority, the UNEP Collaborating Centre on Water and Environment (UCC), UNDP, UNEP Caribbean Regional Co-ordinating Unit (UNEP-CAR/RCU), the Food and Agriculture Organisation (FAO), the United States Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) and the University of the West Indies – Capacity Building for Integrated Water Resource Management (CAP-NET) Project.

Out of this meeting the UCC agreed to provide funding to augment contributions from the IWCAM project towards the development a IWRM Plan roadmaps in the Caribbean using Grenada as a pilot. This contribution will also augment efforts by the GWP to establish a Country Water Partnership on that island. The funding will also augment prior commitment from NOAA to develop an IWRM for one of the islands in the St. Vincent Grenadines.

1.5 Scope of initiative

This initiative seeks to assist the Government of St. Vincent and the Grenadines in the development of an integrated water resources management plan for Union Island to serve not only as a model for upscaling to the mainland, but as a model for the Caribbean islands that share similar physiography.

The contributions to the IWRM development process for the St. Vincent Grenadines were initialized by NOAA in conjunction with CEHI. This

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initiative is being executed by the Caribbean Environmental Health Institute in parallel with a road-mapping process for Grenada. The partners on the initiatives are the Global Water Partnership-Caribbean (GWP-C), the United Nations Environment Programme Collaborating Center on Water and Environment (UCC-Water), the Caribbean Environmental Health Institute (CEHI), and the Integrating Watershed & Coastal Area Management (IWCAM Project). The IWRM roadmap is simply the planned steps toward realization of IWRM.

In January 2007 a team from CEHI and NOAA had initial discussions with stakeholders in SVG under the auspices of the Ministry of Health and Environment to determine the most appropriate Grenadine Island to select for the IWRM roadmap development. Union Island was selected as the demonstration project island for the following reasons.

- The resident community is sizeable enough (in excess of 1,000 full-time residents) to present a good case study for a diverse multi-stakeholder participation process;
- Unlike some of the other Grenadine islands, Union Island is not predominantly owned by few large real estate developers or hotel interests;
- There are serious issues related to availability of water, health and sanitation in the context vector control, and pollution of coastal waters, all of which may be having negative impacts on social and economic development of the island;
- There is a strong willingness of local stakeholders to effect change and realize buy-in to the concept of IWRM;
- The island has suffered from relatively low-keyed attention from central government partly due to its geographic isolation from the mainland, making it a good candidate for focussed attention.

The importance of using Union Island as a demonstration site lies in the fact that it provides a case study for similar small arid islands in the

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Caribbean. The lesson learnt from eth IWRM planning process there will be of value to the other Grenadine islands, the northern Leeward Islands, the Turks and Caicos and the Bahamas. This contribution is also deemed valuable given the emphasis that tends to be placed on the larger less water scare islands of the Caribbean.

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PART 2: Background on Union Island

2.1 Physiography

Union Island is one of the southernmost St. Vincent Grenadines situated at 12° 35 N and 61° 26' W and is some 63 km to the south west of mainland St. Vincent. The island is some 8.5 km^2. Figure 2 illustrates the location of Union Island.

Union Island is part of the Lesser Antillean volcanic island arc that stretches from Grenada in the south to Saba in the north. The Grenadine Islands are the exposed summits of submerged volcanic mountains. Howard (1950) noted that the islands were formed during the late Oligocene epoch, sank or eroded away during the Pliocene epoch and became completely submerged during the Pleistocene epoch. Subsequently regional uplifting of the sea floor raised the Islands above sea level (OAS undated source).

The highest peaks on Union Island rise above 200 metres with Mount Taboi the highest peak (also in all of the Grenadines) standing at 300 metres above sea level. The eastern part of the island is less mountainous. The main topographic divide originates from the westernmost point of the island at Miss Irene Point, runs north-eastward flanking Chatham Estate, then eastward along the ridgeline north of the Union Island airport. The largest watershed unit is the area termed in this report the South-west watershed Unit at 166 hectares. The steep topography and short distances between highest elevations and the shoreline means that runoff is rapid and does not permit the existence of any perennial streams.

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Union Island lies within the humid tropical zone within the Atlantic northeast trade wind belt, and the seasonal shift in these winds give rise to a wet season (June to December) and a dry season (January to May). As with the other Grenadines the average annual rainfall is relatively low at 1,000 mm. Table 1 contains mean rainfall data Union Island. The small size of the island limits the orographic influences that tend to generate significantly higher rainfall amounts over the larger islands. In St. Vincent for example the mean annual rainfall in the interior is as high as 4,000 mm per annum, while in Dominica the average annual rainfall at the highest elevations exceeds 7,000 mm! The Grenadines can experience extended dry periods, and extreme drought conditions during the dry season are not uncommon.

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Table 1. Mean monthly rainfall for Union Island

Month	(mm)
January	66
February	46
March	36
April	40
May	63
June	105
July	130
August	148
September	122
October	154
November	165
December	104
Total	**1,179**

Source: Peters, 2003

The relative humidity ranges between 60% and 96% with an average of 75%. Temperature variation between the daily minimum and maximum is minor although there is seasonal variability. The coolest months of December through March show an average difference of 1.5^{o}C relative to the annual average (Union Island Official website)

The island lies in the more southerly region of the Atlantic Hurricane Belt but has been hit by hurricanes in the past. Hurricane Janet struck the island in between the 22nd and 23rd of September 1955 (National Hurricane Centre website, 2007) as a destructive Category 3 storm. On July 14th 2005 Hurricane Emily passed the island as a category 1 storm damaging 21 houses with four losing their entire roof structure and 17 suffering significant damage. The island's main water storage tank was toppled during the storm (Union Island Official website).

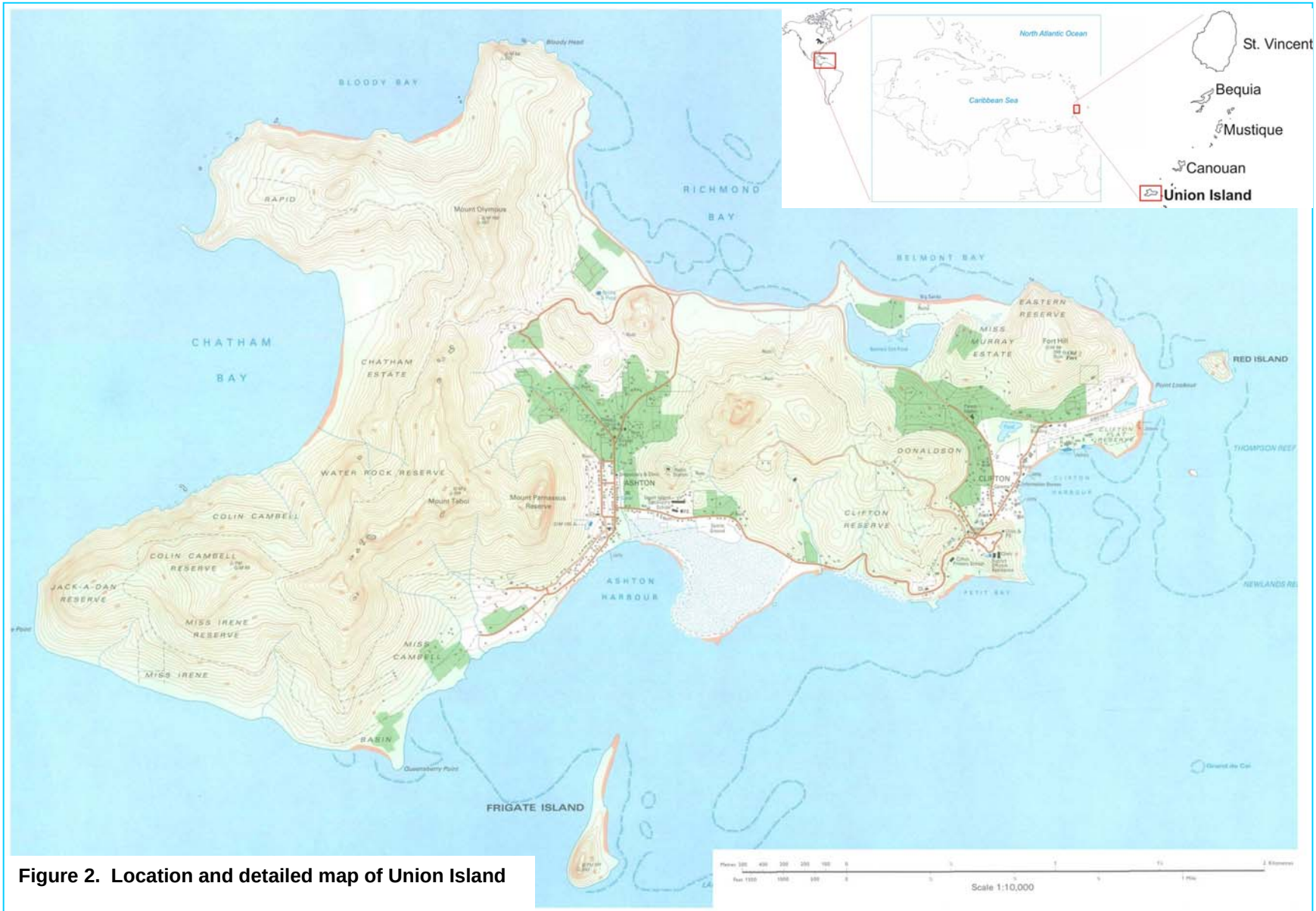

Figure 2. Location and detailed map of Union Island

2.2 Socio-economic aspects

Union Island's most recent population estimate stood at 1,935 people according to the 2001 population census. Most residents live within the settlements of Clifton and Ashton (over 700 individual households). Tourism is now the major economic activity on Union Island along with fishing. In the colonial days the island produced cotton with yields as high as 113,400 kgs per year. Following slavery, the residents relied on subsistence agriculture, trade in poultry, turtle shells and wood. The island was under private ownership throughout the colonial days until 1910 when the British Colonial Government purchased the island and established the Union Island Land Settlement Scheme. The residents were then able to purchase two and four-acre parcels at concessionary rates paving the way for the island's development (Go Grenadines website, 2004).

Figure 3. Aerial view of Clifton and harbour

The island has one health clinic, two primary schools and one secondary school. Most of the commercial activity outside of tourism is centered on retail trade (catering to for local residents and visitors) and the restaurant business. The island does not produce any of its goods locally and virtually everything is imported from mainland St. Vincent and other islands. There is one major marina at Clifton that also caters to the ferry service between the island and mainland St. Vincent. The Union Island Airport services light-aircraft connections between the other Grenadines, St. Vincent and other neighbouring islands.

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Unionites are employed either by the state (schools, postal service, banks, air port, clinics), or by the commercial and hospitality sectors that include accommodation, day-charter and excursion businesses, retail outlets (boutiques and supermarkets), food and entertainment services (bars, restaurants). Fishing is a major economic activity for Union Island, with trade in dolphin, fish, conch and lobsters to major hotels on other Grenadine Islands (Union Island Official website). Livestock production is a significant subsistence activity where sheep, goats, pigs and chicken are reared.

Unlike some of the other Grenadines islands, Union Island is not characterized by large resort facilities. The Union Island Official website lists seven main hotels/apartments with a total of 82 hotel rooms. The yachting sub-sector is significant. In 2004, total visitor arrivals numbered 160,000 (Union Island Official website).

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2.3 Land use, biodiversity and protected areas

2.3.1 Terrestrial biodiversity and land use

The vegetation types that have evolved on the Grenadine Islands including Union Island are reflective of the low rainfall regime. Croton species, *Cordia,* or *Leucaena, Bauhinia ungula* and *Cuidosolus ureus* are found in association on the leeward side of the islands (Howard, 1950; Beard, 1949), cited by OAS (undated on-line source). Species found on the windward side of the island typically include *Coccoloba uvifera, Hippomane*

Figure 4. Typical vegetation cover over the western portion of Union Island

manchinella and *Cocos nucifera.* Dominant species of open woodland areas include *Bursera simaruba, Brosimum alicastrum, Pisonia fragrans, and Ficus lentiginosa.* On the coastal fringe *Randia aculeata, Tabebuia pallida, Coccoloba caribaea,* and various species of *Capparis* are dominant. *Opuntia dilleiri* and *Agave caribaeicola* are found on rocky steep cliffs OAS (undated on-line source).

The western side of Union Island is sparsely developed due largely to the steep terrain, and as a result remains mainly forested (Figure 4). The central and eastern parts of the island are more intensively developed with settlement and grassland areas dominating the land use pattern. Intensive livestock grazing has been a cause for concern on Union Island when during the "let-go season" livestock owners typically allow their animals, mainly sheep and goats, to roam freely to feed unhindered on any type of forage (in the wetter periods animals are usually tethered and taken from one area to another to feed). By the end of the dry season, vegetation is typically grazed down to bare soil. With the onset of the rains, large volumes of topsoil (and nutrients) are lost to erosion while quality forage species rarely get a chance to complete their reproductive cycle, leading to consecutive lowered replenishment over time and degradation of forage quality in general. Figure 5 illustrates land degradation as a result of excessive grazing.

Figure 5. Severe grazing-induced erosion in upland areas around Ashton

The most built-up areas are within community centres of Clifton and Ashton. Ribbon-type settlement radiates outwards along roads into the northern hillslopes surrounding the major community centres.

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2.3.2 Coastal and marine biodiversity and water resources

The largest contiguous mangrove forest in SVG, spreading over approximately 18 hectares, is located on the eastern side of Ashton Harbour (Figure 6). Red, black and white mangrove species as well as buttonwood are present in this fringing-type mangrove ecosystem. A large salt pond is situated on the northern shore at Belmont Bay.

Figure 6. Ashton Harbour fringing mangrove

The largest expanse of offshore barrier reefs lies off the southern coast extending from Queensberry Point, out around Frigate Island and eastwards to Clifton Harbour. Another reef system extends southward from the easternmost end of the island fringing the eastern access to Clifton Harbour. Reefs also fringe the north coast but to a lesser extent, within the Richmond and Belmont Bays. The Ashton Harbour area was formally designated a Conservation Area under Schedule 11, Regulation 20 of the Fisheries Act, on January 5th, 1987 (Goreau and Sammons, 2003).

In 1995 developers commenced the construction of a 300-boat marina at Ashton Harbour. Dredged material was used to create the foundations (causeways) for the berths, held in place by steel reinforcements. In 1999 the project was abandoned due to financial difficulties (Figure 7). Goreau and Sammons (2003) noted that the developers did not pay attention to the

Figure 7. Aerial view of Ashton Harbour with abandoned marina construction in the foreground (note the difference in water colour within enclosed area)

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natural water circulation in the bay and as a result, the causeways effectively blocked the bay's circulation causing the western half of the bay to become stagnant, and the water turbid. The result was a die-off of coral reefs and sea grasses with adverse impacts to lobster, fish, and conch populations. The altered circulation caused sand to accumulate in the eastern half of the bay, smothering coral reefs and sea grasses, affecting fish, lobster, and conch populations there also.

Goreau and Sammons (2003) measured water quality parameters in Ashton harbour and found that the waters in the western half of the bay were characterized by significantly higher temperatures and salinity, with lower oxygen content in comparison to the eastern half.

The communities of Clifton and Ashton generate solid and liquid waste discharges into the Clifton and Ashton Harbours respectively although the extent and severity of the pollution loads are not accurately known.

Figure 8. Polluted main collector drain that services the Ashton community and surrounding watershed basin

The island does not have a central sewerage system hence soak-away septic systems are used to treat waster discharge. All grey water in discharged directly into the environment via drainage canals. Based on discussion with residents, the rainy season brings incidents of flooding to Clifton with the wash of pollutants into the marine environment. The fact that the majority of households and activities are concentrated along the southern coastline it is assumed that water quality is an issue in the southern waters. It is likely that the coastal water quality will vary in response to runoff volumes associated with the dry and rainy seasons. Figures 8 to 10 illustrate typical examples of the water pollution issues on Union Island.

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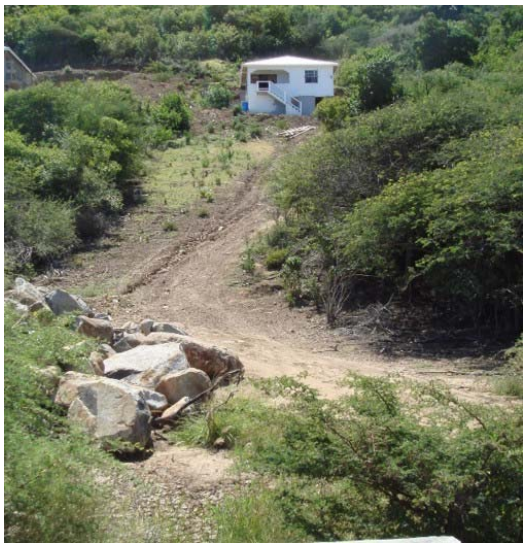

Figure 9. Erosion (channelized within road cut) from house construction

Figure 10. Polluted coastal water at Ashton Harbour (note the nutrient indicator algae at upper right of photo)

Figure 17 is a map that illustrates the locations of key water resources features of interest on Union Island.

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2.4 Water resource management issues on Union Island

A community consultation held with Union Island stakeholders in April 2007 revealed several key issues of concern with respect to management of fresh and coastal waters of Union Island. These issues are grouped under broad thematic areas as follows (note that some of these issues are common to more than one thematic area):

Policy limitations

- Water is not mainstreamed into national development frameworks and therefore afforded relatively low priority;
- Low-level presence and intervention of mainland government in addressing pressing needs; largely related to the geographic distance between the mainland and Union Island;
- Low-level of knowledge and awareness on the concept of IWRM;
- Existing legislative and regulatory provisions are not explicit in addressing issues in the Grenadines context;
- Unregulated land use (has implications for water management).

Human resource capacity limitations

- Health of the environment not monitored due to lack of human and financial resources;
- Construction regulations are not observed due to limited enforcement capacity;
- Pollution abatement (on-land and marine from vessels) not effective due to limited enforcement capacity;
- Low-level presence and intervention of mainland government in addressing pressing needs; largely related to the geographic distance between the mainland and Union Island
- Community rainwater catchments are not properly managed to ensure quality water supply;
- Low human resource capacity to undertake planning for IWRM;
- Low level of knowledge and awareness on the concept of IWRM;

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- Lack of published data for Union Island to guide water resource management.

Water unavailability

- Acute water shortages during the dry season;
    - Lack of adequate storage capacity for maintenance of required water supply particularly during prolonged drought conditions;
    - Lack of adequate catchment systems to maximize rainwater harvesting;
- During acute drought water barged in from mainland St. Vincent is of very poor quality due to the condition of the holding tanks on vessels;
- Water infrastructure is vulnerable to hurricane damage; a water storage tank was damaged in a recent hurricane.

Health and sanitation risk

- Lack of effective vector (particularly mosquito) control with high prevalence of *Ades egypti* mosquito which transmits dengue fever;
- Lack of proper sanitation measures for household RWH systems. There is often a high prevalence of insects and other organisms in storage tanks;
- Indiscriminate burning of garbage in settlement areas with contamination of roof catchments by potentially harmful soot residues;
- Poor solid waste management leads to pollution of drainage systems and the coastal waters;
- Illegal disposal of solid waste. Not enough trash receptacles in downtown Clifton which leads to improper waste disposal;
- Communal rainwater catchments are not properly maintained;
- Low human resource capacity to undertake planning for IWRM.

Ecosystem degradation

- Poor solid and liquid waste management that leads to pollution of terrestrial and marine ecosystems;

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- Poor building and infrastructure construction methods and non-compliance to construction regulations that results in excessive erosion and sedimentation of coastal waters;
- Heavy grazing by livestock leads to accelerated erosion in upland areas;
- Sand mining and associated loss of coastal habitats (notably at Big Sands on the north shore).

External factors

- Climate change impacts such as sea level rise and associated problems with saline intrusion (affects ground water) and increased vulnerability to hurricanes
- Changes in the global trading environment that may negatively impact on costs of goods and services and socio-economic circumstances in general;
- Changes in the tourism sector in response to changes in the global economy; impacts on socio-economic circumstances.

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Part 3: Main findings of an IWRM preliminary assessment

A situational analysis was carried out on Union Island to examine the key factors of influence in water resources management, characterise the present situation and determine the general approach necessary for IWRM. The study aimed at reflecting the concerns and impacts of the present water management systems on users, development, the environment and society as a whole. For this purpose, a data collection instrument (see Annex) was developed and administered to a cross-section of relevant stakeholders on Union Island and mainland St. Vincent. The data collection instrument was designed to capture all aspects pertinent to IWRM including *inter alia*:

- Processes and milestones leading towards IWRM;
- Policy environment;
- National legislative and institutional framework for the water sector;
- Resource analysis.

The survey was carried out by a consultant contracted by the Caribbean Environmental Health Institute. The summarized results of the assessment and key tabulations are provided in the next sections.

Representatives from the following organizations were interviewed:

Table 2. Stakeholders interviewed in preliminary IWRM assessment

Location	Institution
Mainland St. Vincent	Office of Grenadines Affairs
	Forestry Department
	Fisheries Department
	Statistical Department

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Union Island	Central Water and Sewerage Authority (CWSA) Revenue Office Tourist Office Sustainable Grenadines Project Union Island Environmental Attackers (NGO) Community of Ashton and Clifton Health Centre (Clifton)

3.1 Processes and milestones leading towards IWRM

3.1.1 National water resources management vision

There is no well-defined vision statement for IWRM at the national level. No such dialogue has been raised on Union Island to date. There is a general notion however that the vision for water is closely associated with securing a safe and reliable supply of drinking water for all.

3.1.2 Awareness and support for defining a vision for IWRM

At the national level there is a relatively high level of commitment to formulation of a water resources management vision at the senior policy, technical and core stakeholder levels. The general population appears not so committed, likely a function of their awareness level. On Union Island awareness is more acute given the water scarcity situation and there is relatively higher support than at the national level.

3.1.3 Awareness on IWRM

Most stakeholders have some concept of the need to properly manage water resources and this is taken to mean that there is a basic level

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understanding of IWRM. The table provides a relative scoring for various stakeholder groups.

Table 3. Stakeholder awareness of IWRM on SVG and Union Island

What is the level of awareness on the philosophy, concepts, principles and practices of IWRM for the following stakeholder groups: (Rating: 0 = none; 1 = to a little degree; 2 = to a reasonable degree; 3 = fully)	**Rating**			
	0	**1**	**2**	**3**
National level politicians			✓	
Local level politicians			✓	
High level policy/Decision Makers (National Level)			✓	
Decision makers in agencies responsible for water resources management			✓	
Decision makers in agencies within the water use and water related sectors			✓	
Professionals in agencies responsible for water resources management			✓	
Professionals in agencies within the water use and water related sectors			✓	
Major Water Users (Industry, Agriculture, Tourism etc)			✓	
NGOs in the water sector			✓	
CBOs in the water sector			✓	
Local/community level decision makers			✓	
Water sector consultants				✓

3.1.4 Existence of an IWRM Plan and contributing partners

An IWRM Plan does not currently exist. The European Union-funded National Water Resources Management Project (NWRMP) will contribute to the development of an IWRM Plan at the national level. It is anticipated that the initiative on Union Island will contribute to this project.

The Integrated Forest Management and Development Programme seeks to rationalize forest resource management in the context of water services provision, but this initiative is confined to the mainland. Lessons in participatory land resource management may be useful in development of management principles for Union Island. The project is being supported by the Central Water and Sewerage Authority, the St. Vincent Electricity Services Ltd. and the Government.

Through prospective EU funding, the National Irrigation Authority is advancing improved irrigation management for agricultural production.

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This effort will likely see investment in water conservation and augmentation measures such as RWH that will be of value to Union Island in the context of transferring lessons.

The Tobago Cays Marine Park management regime for coastal waters will continue to be instructive to IWRM planning in the context of Union Island and the other Grenadines.

3.1.5 Other plans that are likely to contribute to IWRM

The following are some development planning frameworks that will have implications for water resources management in Union Island.

National Environmental Management Strategy and Action Plan: St. Vincent and the Grenadines has prepared a National Environmental Management Strategy (NEMS) and Action Plan, giving effect to the St. Georges Declaration of Principles for Environmental Sustainability (SGD). The SGD contains 21 principles and mandates member states of the sub-region to work towards sustainable management of the land and water resources. The NEMS was developed through a process of district and sectoral consultations, a review of key policies and programmes, and feedback from a national consultation on the draft NEMS. The NEMS attempts to harmonize existing initiatives and programs of various government agencies as they relate to environmental management and the country's obligations under international conventions. The NEMS will attempt to mainstream environmental (including water) concerns into the national development processes.

A draft National Physical Development Plan (NPDP) was prepared in 2001 by the Ministry of Finance and Economic Planning. However this Plan was never finalized. The plan was intended to set out appropriate policies and strategies that would promote sustainable integrated national development through judicious management of land and

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related assets. Some of the key land and water resources provisions articulated the plan included:

- Facilitation of poverty alleviation initiatives;
- Conservation and protection of the country's natural resources;
- Promotion of order in the settlement pattern in the country;
- Promotion of satisfactory standards in the built environment;
- Development of an efficient system of transportation and public utilities;
- Allocation of land and infrastructure for adequate housing;
- Guarantee of an equitable distribution of community social facilities.

The National Action Plan (NAP) under the United Nations Convention to Combat Desertification (UNCCD) is intended to advance national obligations under the Convention in a systematic, effective and efficient manner. The country is in the development process of its NAP (to be submitted to Cabinet for approval in early 2007). This Plan would allow SVG to take a more comprehensive approach to general environmental management, paying special attention to the prevention and control of land degradation. The NAP seeks to increase awareness by all stakeholders on the issues of land degradation, serve as a guide in the execution of investments in SLM and foster greater synergies at the national level in the implementation of the other sustainable development conventions. The NAP will be implemented with the assistance of all stakeholders including Government, private sector, NGOs, CBOs and civil society.

3.1.6 Special water resources management initiatives

The following are initiatives focussed on water resources management that will contribute to the IWRM development process at the national level:

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National Water Resources Management Project: This EU-funded project which commenced in January 2007 will be executed over two years through the Central Water and Sewerage Authority. The project states the following objectives:

- Establishment of monitoring systems for resources availability and demand;
- Recommendations for integrated management through institutional adjustments;
- Development of a decision support system for planning and management;
- Preparation of feasibility studies for perennial water supply on the islands of Bequia, Canouan and Union Island.

Integrated Watershed and Coastal Areas Management (IWCAM): This regional project is being implemented jointly by the UNDP and UNEP and executed by the Caribbean Environmental Health Institute (CEHI) and UNEP-Caribbean Environment Programme, Regional Coordinating Unit (Car/RCU). This five-year (2006-2011) Global Environment Facility (GEF)-funded project aims to strengthen the capacity of participating countries to implement an integrated approach to management of watersheds and coastal areas, with the overall goal of enhancing the capacity of the countries to manage their aquatic resources and ecosystems in a sustainable manner. The Project was launched in the first half of 2006 and implementation is underway. SVG is expected to benefit from the regional-level components of the project, specifically (a) Development of IWCAM Process, Stress Reduction and Environmental Status Indicators, (b) Policy, Legislation and Institutional Reform and (c) Regional and National Capacity Building and Sustainability. The focal point for this project in SVG is the Environmental Services Unit.

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3.1.7 Context for IWRM planning

In SVG the participatory process is strongly advocated as the preferred alternative to the traditional approach of a largely technocrat-driven process without the necessary level of stakeholder awareness and input. It has been generally accepted that the two lead agencies to drive the IWRM process will be the Ministry of Health and the Environment and the Ministry of Agriculture, Forestry and Fisheries. The Central Water and Sewerage Authority will be the lead non-ministerial partner agency.

The general consensus is that IWRM for SVG will have to be built on the lead theme of water security for human development.

3.1.8 Challenges and constraints to IWRM

In general, there are fragmented approaches to natural resource management on SVG that results from a myriad of factors that include weak/on-existent institutional capacities, general systemic limitations in terms of absence of governance structures for NRM (across both public and private sectors and civil society), and resource (human and financial) limitations. These issues are captured in the following table.

Table 4. Challenges and constraints to IWRM in SVG and Union Island.

Challenges/Constraints to the IWRM development processes (Rating: 0 = Not relevant; 1 = Not Severe; 2 = Severe; 3 = Very Severe)	**Rating**			
	0	**1**	**2**	**3**
Lack of Good Water Governance			✓	
Fragmented Approach to IWRM:				
• Multiple institutions, each with their own piece of legislation and Mandate, none of which is broad and deep enough			✓	
• Assign responsibilities for planning; management and operations affecting quantity to units separate from those responsible for quality management			✓	
• Poorly defined responsibilities for departments/section			✓	
• Overlap of responsibilities, resulting in duplication			✓	
• Cost trade-off between the pollution control and water supply treatment in the same watershed is not evaluated, thus the national investment policies and programmes do not reflect the interrelationships between quality and quantity.			✓	

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Lack of effective integration and coordination hampered by:				
• The absence of sound and comprehensive national policies on water resources				✓
• The multiplicity of institutions that deal with the management of the resources			✓	
• The multiplicity of laws, each dealing with separate aspects of the management of the resources, thus encouraging compartmentalization			✓	
• Institutionally divided approach to dealing with environment and development*			✓	
• Poor management of the dynamics of water supply and demand **				✓
• Inadequate legal and regulatory frameworks for managing the resources.			✓	
• The absence of a credible framework for involving civil society in the management process**				✓
• The lack of a proper understanding and awareness of the principles of sustainable development and an appreciation of the inseparable linkages between environmental, social and economic issues**				✓
• Institutional arrangements for integrated water resources management are weak/ non-existent**			✓	

Lack/inadequate institutional resources				
• Lack/inadequate human resources			✓	
• Inadequate of equipment			✓	
• Inadequate financing				
• Weak technical capabilities/lack of a critical mass for water resources management**			✓	
• Inadequate Research and Technology			✓	
• Inadequate Data and Information Management Infrastructure			✓	
Conflict between water supply and demand			✓	
Poor land use planning and soil management in watersheds			✓	
Poor pollution prevention and control			✓	
Limited/poor Stakeholder Participation			✓	
Limited/little Public Awareness and Education			✓	
Lack of Promote the economic, social and ecological values of water			✓	
Impact of Climate Change and Sea level Rise				✓

**Observation unique to Union Island and perhaps to a lesser extent for mainland St. Vincent

3.2 Policy environment

There is no national water policy for St. Vincent and the Grenadines and there is no specific plan for development of water resources on Union Island. However the EU-funded National Water Resources Management Project will contribute to the building block required for a national policy.

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Other policy statements that are being contemplated by the GOSVG include a National Forest Policy that seeks to enhance integrated forest resources management the places emphasis on upper watershed and mangrove management, and a National Land Use Policy that seeks to ensure proper distribution of lands and protect lands that are critical to water resources.

National policy development is being framed against the regional and international treaties and conventions the country is signatory to. The following table summarizes the environmental conventions the country has ratified.

Table 5. Key international and regional multi-lateral conventions SVG is party to.

Conventions	Lead Institutions	Plans
UN Convention to Combat Desertification (UNCCD)	Ministry of Health and the Environment; Ministry of Agriculture, Forestry and Fisheries; Ministry of Finance and Economic Planning	National Action Programme under development
UN Framework Convention on Climate Change (UNFCCC)	Ministry of Health and the Environment	Draft National Climate Change Action Plan developed
UN Convention for the Conservation of Biological Diversity (UNCBD)	Ministry of Health and the Environment; Ministry of Agriculture, Forestry and Fisheries, National Parks Authority	National Biodiversity Strategy and Action Plan developed
Cartagena Protocol on Bio-Safety	Ministry of Health and the Environment; Ministry of Agriculture, Forestry and Fisheries	National Biosafety Framework being developed
Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer	Ministry of Health and the Environment	Terminal Phase-out Management Plan (TPMP) developed and being implemented
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Ministry of Health and the Environment	No plan developed
OECS Saint George's Declaration of Principles	Ministry of Health and the Environment	National Environmental Management Strategy developed

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3.3 National legislative and institutional frameworks related to the water sector

At the national level there is consensus that many of the legal provisions to promote the sustainable development and management of water resources exist within various pieces of legislation. However the various laws tend not to be integrated in a synergistic manner with each other to realize efficiency gains in their implementation and facilitate coordination amongst the responsible agencies.

The following are the legislative instruments that lend effect to various aspects of water resources management in St. Vincent and the Grenadines and the manner in which these instruments are administered on Union Island.

3.3.1 The Central Water and Sewerage Act (No. 17 of 1991)

The responsible agency is the Central Water and Sewerage Authority. The Act makes provisions for water resources abstraction and distribution, water quality management. It authorizes the Minister to set aside protected areas for the protection of water resource. Relative to the other national laws for SVG, this Act is most encompassing on the elements of water resources management. The Act will need to be scrutinized to understand the extent to which it truly 'integrates' water resources management.

The Act makes provision for multi-sectoral representation through a Board that includes civil-society representatives, although it is not specific to particular target groups, excepting having representation of a resident of Kingstown, a non-Kingstown resident and a representative of the business community. The Board does not include representation from the Grenadine Islands. Water use efficiency is addressed in the Act

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through the provisions of user fees. The issue of user fees does not apply in Union Island as the water is harvested off private roof catchments.

The Act makes no specific provisions for water resources management on the Grenadine islands. It is silent on development and management of rainwater harvesting systems or other water augmentation measures such as desalination.

On Union Island the CWSA has no institutional role in water resources management. This situation may have arisen since water access is not through services of a public utility as the bulk of the water in use is abstracted predominantly from private roof-top catchments. The District Office operates the role as manager of the community rainwater infrastructure on the island (Donaldson and Ashton catchments). This role may be been assigned by default given that they are responsible for all public infrastructure works on the island.

The CWSA on Union Island has responsibility for solid waste management in accordance with the Waste Management Act of 2000.

3.3.2 St. Vincent and the Grenadines Waste Management Act (No.31 of 2000)

Under Section 3 of the Act the Central Water and Sewerage Authority is appointed as National Solid Waste Management Authority. The Act makes provisions for the public management and disposal of solid waste including hazardous waste, and provides for appointment, functions, etc. of the National Solid Waste Management Authority. The Act prohibits the deposit of solid waste on designated lands and waters and stipulates licensing requirements for the construction and operation of waste management facilities.

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The CWSA manages the sole solid waste disposal facility on Union Island and maintains a small staff complement.

3.3.3 Town and Country Planning Act (1992)

The responsible agency is Ministry of Finance and Planning. The legislation provides for the coordination and control of all development initiatives in SVG and makes provisions for the orderly and progressive development of land and the proper planning of town and country areas, as well as for control of development. The Central Planning Division of that Ministry coordinates development projects, while the Physical Planning Unit reviews EIAs and prepares physical development plans. All recommendations of the Unit are subject to final decision by the Physical Planning Development Board. Under Section 30 of the Act, the Minister may order the Director of the Physical Planning Board to take such steps as are necessary to remove, mitigate or prevent any condition that poses or is likely to pose a threat to the environment.

There is no local institutional representation of the Ministry on Union Island. All development applications are forwarded through the District Office to the mainland St. Vincent ministerial headquarters for review and approval. As required, officials from the Ministry will visit the island for follow-up review processes.

3.3.4 Environmental Health Services Act (1977)

The responsible agency is the Environmental Health Division. The Act makes provisions for the protection of human health, harmful vector and disease control. The Act provides a basis for effective environmental health quality control, however is limited by the fact that certain minimum standards regarding air pollution and water quality are absent from the Act.

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At present no Public Health Department officers are stationed on Union Island on a full-time basis. The CWSA will carry out limited water quality monitoring should the need arise.

3.3.5 National Parks Authority Act (2002)

The responsible agency is the National Parks, Rivers and Beaches Authority, Tourism and Sports. The Act is intended to promote the establishment of National Parks for the preservation, management and development of the national physical and ecological historical and cultural heritage of SVG. No regulations have been developed to effect this Act.

3.3.6 Forest Resources Conservation Act (1992)

The responsible agency is the Forestry Department, Ministry of Agriculture, Forestry and Fisheries. The Act makes provision for forest management, reforestation, and forest resources conservation. It mandates the creation of a specialized forest management agency and authorizes it to manage the national forest resource base.

There is no resident representation of the Forestry Department in Union Island. As the need arises, staff of the Forestry Department will visit the island. According to the topographic map for Union Island (Figure 2) there are six upland areas listed as reserves. These reserves were not effected by statues under this Act and it is believed that they are residual lands that remained unsold.

3.3.7 Fisheries Act (1986)

This Act governs fisheries access agreements, local and foreign fishing licensing, fish processing establishments, fisheries research, fisheries enforcement and the registration of fishing vessels. The legislation also specifies conservation measures such as prohibition of the use of any

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explosive, poison or other noxious substance for the purpose of killing, stunning, disabling or catching fish, close seasons, gear restrictions, and the creation of marine reserves. The Ashton Harbour is a marine reserve designated under the Fisheries Act. The legislation gives the Minister responsible for fisheries the authority to create new regulations for the management of fisheries when necessary (FAO, 2002).

Like the Forestry Department, there are no permanent Fisheries Department personnel stationed on Union Island.

3.3.8 The National Environmental Advisory Board (NEAB)

The NEAB is a multi-disciplinary, multi-sectoral, statutory body that was established in 1996 to guide the implementation of the National Environmental Management Strategy (NEMS) and give general direction to environmental activities in SVG. The Board members are required to advise the Minister of Health and the Environment on all matters relating to the environment, and to oversee, review and monitor all projects and development activities with environmental considerations including water resource management. The Environmental Services Coordinator is the chairman of the NEAB. In practice, the NEAB also assists the ESU in its efforts to promote and coordinate implementation of environmental programs by other government agencies. While this body is one mechanism that has improved environmental coordination and priority setting in SVG, there is a need to strengthen the body since it performs only an advisory role, but its rulings are not binding on government bodies.

The NEAB tends to be slow to make decisions; partly because it meets once every two months and its participants often do not have the authority to take decisions, but must refer back to their respective agencies. This NEAB needs to take on a more active role in designing, developing and coordinating the implementation of projects related to

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the environment. It is hoped that revising the membership of the NEAB to undertake an expanding role as a coordinating entity is one mechanism to address sustainable land management by including the involvement of all the stakeholders. There is no specific representation on the NEAB by stakeholders from the Grenadine Islands.

3.4 Stakeholder capacity for water resources management

There is a difference between the capacities between the public and private sectors for management of water resources. In general, public sector agencies and their representatives have some level of capacity in different areas related to IWRM. This is expected given their statutory functions as monitors and regulators. Capacities in some functions are less well-developed due to un-evolved roles and resource constraints. In the private sector special capabilities in water resource management are generally less developed. The following table provides insights on the relative capacities within public and private sector organizations for IWRM for SVG in general. For Union Island the assumption is that such capacity is low and needs to be built.

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Table 6. Stakeholder capacity for WRM in SVG and Union Island

Capacity for Water Resources Management (Rating: 0 = no capacity; 1 = little capacity, needs to be built; 2 = some gaps but is workable; 3 = capacity fully exist)	**Rating *Public* Sector**				**Rating *Private* Sector**			
	0	**1**	**2**	**3**	**0**	**1**	**2**	**3**
Policy Formulation		✓				✓		
Drafting of laws & regulation			✓			✓		
Preparation of WR Assessments			✓		✓			
Preparation of EAs			✓				✓	
Preparation of Socio-economic Assessments			✓				✓	
Monitoring of Water Quality			✓			✓		
Monitoring of Water Availability			✓			✓		
Monitoring of aquatic ecosystems			✓			✓		
Monitoring of Pollution loads			✓			✓		
Monitoring of Water Use			✓			✓		
Resource Use planning, protection and conservation			✓			✓		
Water Demand Management			✓			✓		
Water Allocation		✓			✓			
Conflict mediation		✓			✓			
Information generation, collection, analysis		✓			✓			
Laboratories for testing			✓			✓		
Measuring impacts		✓			✓			
International Negotiations		✓			✓			

3.5 Stakeholder assessment

A preliminary assessment of relevant stakeholders, their relative interests, potential contribution to the IWRM development process and relative importance was carried out. It must be noted that all stakeholders at the national level were considered, including specific groups on Union Island. The results are contained in the table below.

Table 7. Assessment of relative influence of stakeholders in WRM processes

Stakeholder	**Interests**	**Likely impact of the IWRM Plan**	**Priority influence (HH, HL, LH, LL)**	**Stakeholder Category (1-4)**	**Capacities**	**Potential roles in the IWRM Plan**
CWSA	Portable water	Water distribution	LH	2	Trained engineers, lab	Policy setting, process leadership and data collection
Forestry Dept.	Forest and watershed management	River basin management	HL	2	Trained technicians	Technical assistance, planning and support

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Stakeholder	Interests	Likely impact of the IWRM Plan	Priority influence (HH, HL, LH, LL)	Stakeholder Category (1-4)	Capacities	Potential roles in the IWRM Plan
Fisheries Dept.	Fisheries and marine conservation	Coastal waters management	HL	2	Trained technicians	Technical assistance, planning and support
Agriculture Dept.	Farming and soil productivity management	River basin farming practices	LL	2	Trained Technicians	Technical assistance, planning and support
St. Vincent Electricity Ltd	Energy, production and distribution	Hydro power river use and pollution control	LL	4	Trained technicians	Pollution mitigation from plant operations (control of fuel runoff into ground and surface water)
National Parks, Rivers and Beaches	National Parks development	Recreational waters use	HL	2	Limited in technical assistance	Planning and support for protected areas
Ministry of Health and the Environment	Public health and environmental sustainability	Water quality and pollutant monitoring and management	HH	1	Technicians and legislative support	Policy setting, process leadership, technical support
Bureau of Standards	Quality and product standards	Water quality standards development	LH	2	Technicians and laboratory resources	Monitoring and technical support
Ministry of Community Development	Development of rural communities	Community mobilization around IWRM	LH	1	Social workers	Education and group strengthening
Union Island Tourist Board	Recreational water quality	Recreational waters use	HH	1	Advocacy	Policy setting, advocacy and support
Union Island Revenue Office	Infrastructure management	Responsible for public catchments	HL	2	Limited; presently just a regulator	Policy setting, process leadership, monitoring and financing
Union Island Environmental Attackers	Union island environment	Protection of water resources	HH	1	Limited training but good reputation	Monitoring, advocacy and support
Union Island 4H Club	Community development	Education outreach around IWRM	HH	1	Limited but strong youth base	Support with outreach and education
Union Island Tourism Committee	Visitor attraction and comfort, Recreational water quality	Sustainable Water supply, Recreational waters use	HH	1	support	Policy setting, advocacy and support
Union Island Museum and Ecological Society	Aesthetics and natural history	Environmental enhancement	HH	2	support	Advocacy and support
Households	Sustainable water supply	Access to improved water supply	HH	2		Management of water use
Hotels and/or Association	Sustainable water supply, Recreational water quality	Access to improved water supply, Recreational waters use	HH	1		Management of water resource use

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Stakeholder	Interests	Likely impact of the IWRM Plan	Priority influence (HH, HL, LH, LL)	Stakeholder Category (1-4)	Capacities	Potential roles in the IWRM Plan
Stakeholder categories: 1. Those who will likely want to participate fully or whose active involvement will determine the credibility of the process; 2. Those who would likely play a more limited role; 3. Those who would wish simply to be kept well informed; 4. Those who would not want to be involved				**Priority/influence rating:** HH – High Priority/High Influence: These stakeholders are the bases for an effective coalition of support for the project HL – High Priority/Low Influence: These stakeholders will require special initiative if their interest are to be protected LH – Low Priority/High Influence: These stakeholders can influence the outcomes the project but their priorities are not those of the project. They may be a risk or obstacle to the project LL – Low Priority/Low Influence: These stakeholders are of least important to the project		

3.6 Water resource situational analysis

3.6.1 Rainwater harvesting in the Grenadines

No specific studies on water use have been carried out for Union Island. A paper by Peters (2003) provides some key insights on the practice of rainwater harvesting in the Grenadines. Although many of the observations are for Carriacou, it is assumed that the situation is largely similar to what obtains on neighbouring Union Island. The following are some key observations by Peters:

- Rainwater storage systems in the Grenadines comprise of both underground and above ground concrete cisterns (average 30,000 litres), metal tanks with capacity of (760–1,900 litres), plastic tanks (760–3,000 litres), drums (170 litres) and wood barrels (130–150 litres).

- Per capita consumption is about 46 litres per person per day but can be as high as 136 litres per person per day (Procicaribe, undated online source). Additional uses can drive this rate upwards. Residential water needs vary depending on the type of dwelling, number of residents, and type of plumbing fixtures, all of which are influenced by the economic status of the users.

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During extreme drought conditions that according to residents, occurs once every five years, water has to be shipped into Union Island from mainland St. Vincent using water tankers.

3.6.2 Freshwater management on Union Island

Household/commercial/institutional systems: In the past households with self-contained RWH storage systems were built with stone and mortar below-ground or partially below-ground. These storage cisterns typically constituted the foundation and floor slab of the building. However, construction of such cisterns is finding less favour on account of the high cost it adds to the building during construction and availability of cheaper storage alternatives. It is estimated that concrete cisterns can contribute as much as 30% to the cost of building (Peters, 2003). This has implications for lower-income home owners. Concrete cisterns are more often installed in more upscale housing projects where home owners have significantly higher demands and can afford the added cost. Furthermore, there tends to be less willingness to use multiple above-ground PVC tanks on such properties on account of unsightliness.

The plastic PVC tank is the preferred option for water storage for low to middle-income households. They are relatively cheap, are easily installed, and require little maintenance. The typical tank size ranges from 2,273 m^3 (500 gallons) to 3,637 m^3 (800 gallons) and it is common practice to use two or more tanks in series.

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Figure 11. Typical household rainwater harvesting

Many householders also use unscreened metal drums and other vessels for water collection. This practice is a hazardous one as it contributes to the breeding of mosquitoes, a problem in Union Island[3]. In addition, many households do not use proper screening to keep out undesired organisms, nor use first-flush techniques in diverting contaminated roof water from the first rainfall from the storage system. As a result the stored water is easily contaminated and serves as breeding grounds for harmful vectors.

Maintenance of storage systems at some public institutions is not up to an acceptable standard and contributes to losses through leakage and contamination. In addition, the storage capacities of the systems at some of these public buildings are not adequate.

There are 7 hotels and 11 guesthouses on Union Island. All have tanks for the collection of roof water. The Anchorage Yacht Club hotel has a

[3] Mosquitoes also breed in the innumerable holes in the ground left by land crabs

desalination facility and obtains all its water by this means; the generation capacity is not known however.

Communal catchments: There are three communal catchments on Union Island. Two are surfaced hillsides, one at Clifton (Donaldson catchment) and the other at Ashton. The Donaldson catchment, intended to service the Clifton community has a 22,730 litre (5,000 gallon) storage. This project was initiated in 2002 but has yet to be commissioned. The perimeter fence around the facility needs to be completed and the entire surface sanitized to rid the contamination from livestock that routinely enter the facility. The access road to the facility is not completed. The stored water is not drinkable due to contamination, however it is used for non-potable purposes, mostly to supply water for construction projects. The Ashton catchment has a storage capacity of 90,922 litres (20,000 gallons, split between two tanks) and is used by the community during extreme water shortage.

Figure 12. Donaldson community RWH catchment

Water from the communal systems is free to users. Both catchments are managed and maintained by the local

Figure 14. Celina Clouden Hospital / Clifton Health Centre RWH catchment

District Office which falls under the jurisdiction of the Ministry for Grenadine Affairs. The District Office retains salaried attendants to maintain the facilities and distribute water to users.

The third catchment serves the Celina Clouden Hospital / Clifton Health Centre and has a storage capacity of 36,370 litres (8,000 gallons). This is the primary source of water for the hospital and surplus permitting, water is made available to residents.

It is noted that Ashton is more self-sufficient in water provision than Clifton due to the fact that more households in Ashton have installed RWH collection systems. Many of the households in Clifton are rental properties and often not provisioned with adequate RWH storage capacity.

Surface Ponds: There are at least nine surface ponds at various locations around Union Island. These ponds once provided vital supplies of rainwater for livestock rearing and agriculture. In time of extreme drought these ponds also provided water supply for residents. Present-day use of the ponds is not as important given the decline in agriculture and organized livestock husbandry. Many ponds are degraded and present day extraction rates from these ponds is not known.

Wells and Boreholes: There are four wells on Union Island and augment supply for livestock watering and other non-potable uses.

Figure 15. Abandoned pond.

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Figure 16. Freshwater well at Ashton

Figure 17 depicts the locations of Union Island's key water resource facilities.

3.6.2 Waste water treatment

On Union Island approximately 75% of the households are equipped with soak-away septic systems, while the remaining 25% are equipped with pit latrines. There is no central sewerage treatment system on the island neither are there package waste recycling plants.

3.6.3 Water Ownership

Water is regarded a common property resource, and in accordance with the Central Water and Sewerage Act all natural waterbodies are the property of the state. On Union Island, the communal RWH systems and wells are property of the State.

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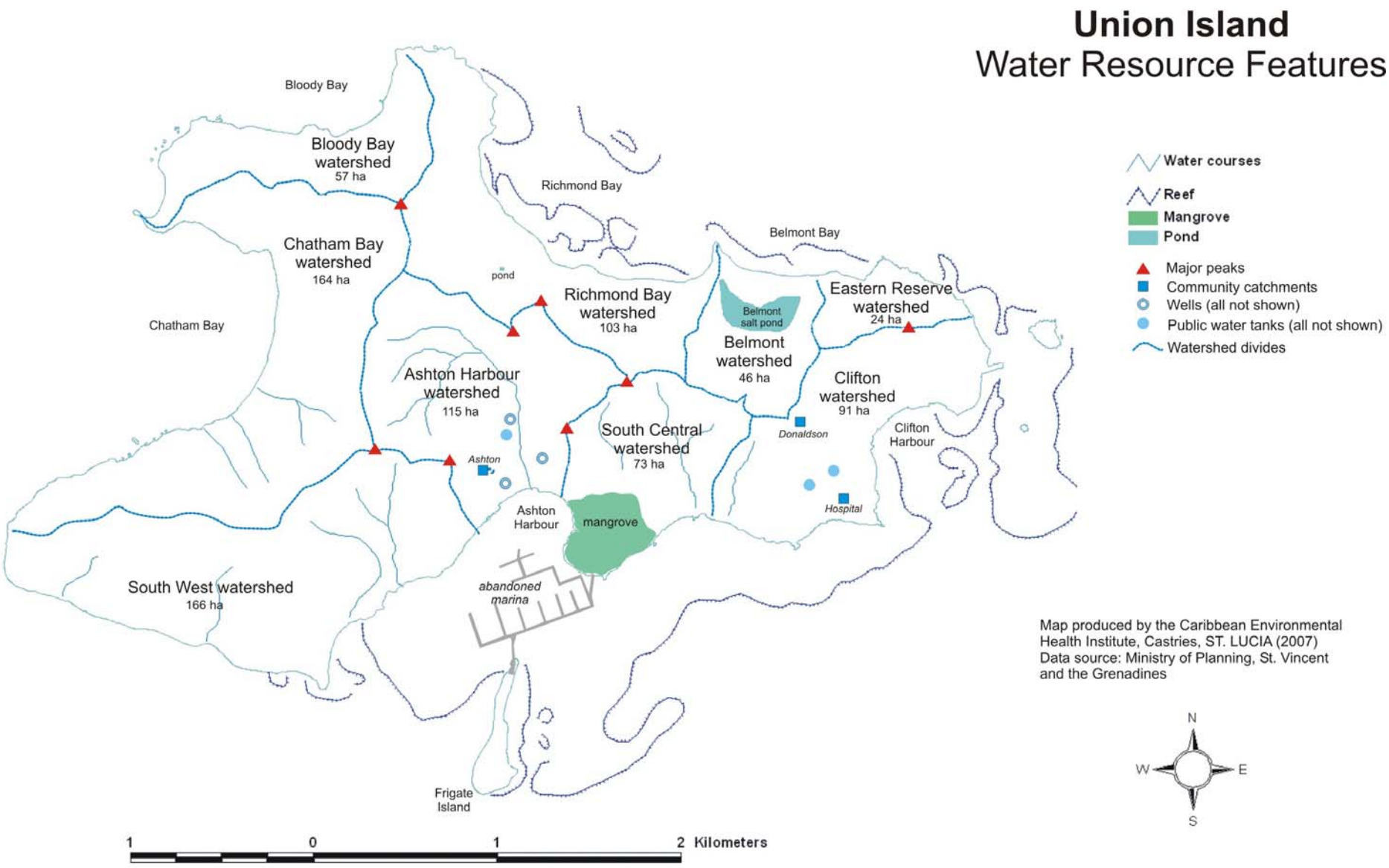

Figure 17. Union Island water resources features (note: not all features may be captured; updates will likely be required)

PART4: A Roadmap for IWRM in Union Island

4.1 Strategic Directions for IWRM Development – The "Roadmap"

This section presents a roadmap for an IWRM Plan development process for Union Island. The process outlined was primarily derived from the GWP/Cap-Net Training Manual and Operation Guide to development of Integrated Water Resources Management Plans.

In charting a course toward the development of the Integrated Water Resources Management Plan, the purpose of the plan and the specific issues to be addressed must be carefully considered. An IWRM Plan will vary between countries depending on the country circumstance in terms of water availability, demands, conservation issues and future projections. The roadmap will assist drivers of the IWRM Plan development process in identifying and completing the required tasks that will be necessary in development of the Plan.

The roadmapping process must be cognizant of the aims of the Plan and the principles that underpin the Plan. These aims are outlined below.

There are three main aims of an IWRM Plan:

- To **heighten awareness** and understanding of the value and benefits of integrated water resources management and vulnerability of human health and the environment from poor Water resources management;

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- To **identify and implement actions** to address specific causes of negative impacts and threats on human health and the environment from poor water resources management practices;
- To **mobilize resources and partners**, including the private sector, for implementation of specific projects to address the negative impacts and threats on human health and the environment from poor water resources management practices.

There are some general principles that apply to all IWRM Plans:

(A) Content

- The plan should incorporate a commitment to integrated water resources management and set out how this could be effectively implemented;
- The plan should be comprehensive in scope, reflecting the interdependence and indivisibility of water resources management;
- The plan should be action-oriented;
- A successful IWRM Plan should be selective in the planning phase and focused on a few specific strategies appropriate for the country, rather than addressing all possible strategies. In particular, for those countries with limited resources, an incremental approach to the development of an IWRM plan is considered more realistic and effective (start small and increase gradually);
- Adequate, timely, and sustainable budgets originating from diverse sources are crucial in implementing an IWRM plan;
- An IWRM plan will have international dimensions (in context of the national level plan for SVG).

(B) Process

- Process and outcome are equally important;
- Continued high-level political commitment throughout the development and implementation phases. This includes having an influential agency or ministry to lead the process for developing the plan as well as having a high profile patron or advocate to promote it such as the Prime Minister or other Minister;

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- An inter-sectoral coordinating committee is crucial in putting the plan into practice. Members of such a committee must participate regularly in meetings and have authority to delegate appropriate activities in their sectors;
- Effective monitoring and review of implementation is essential;
- The process should be continuous, with the conclusion of one component of the plan leading to the commencement of another.

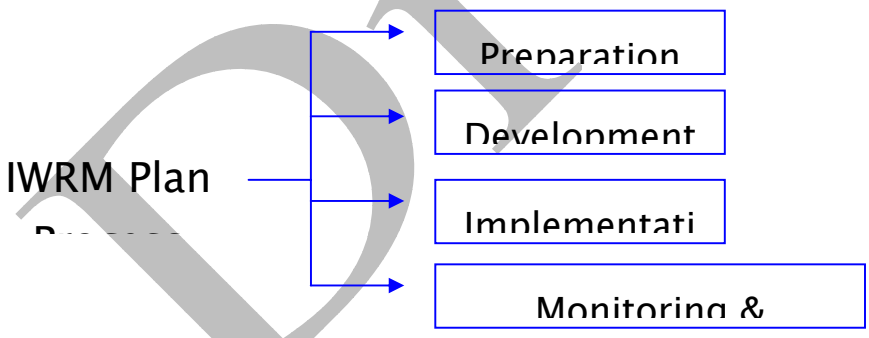
(C) Participation

- There should be a broad and intensive consultation process with civil society and the general public.

(D) Transparency

- The plan should be a public document.

Broadly there are four main stages in developing an IWRM Plan as illustrated below.



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4.2 IWRM Roadmap actions

The roadmapping exercise is therefore the 'Preparation' stage that will lay out all the required elements for actual development of the plan. The next sections describe **nine actions** in the roadmap that Unionites and its development partners will need to undertake towards preparation of the IWRM Plan for Union Island. It is important to note that the Union Island IWRM Plan is to be regarded as a sub-component to a national level IWRM Plan for the state of St. Vincent and the Grenadines.

4.2.1 Action 1: Process initiation

The IWRM planning process for Union Island commenced in January 2007 with the convening of an inter-sectoral visioning workshop. The stakeholders included representatives from the Ministry of Health and Environment, National Emergency Management Organisation, Forestry Department, National Parks Authority and Ministry for Grenadines Affairs. At this dialogue it was agreed that Union Island would be the most suited candidate as a pilot site for IWRM planning (refer to background section for rationale for selection of Union Island as the pilot site).

In a follow-up workshop with local stakeholders on Union Island in April 2007, strong commitment was expressed to the process, given the acute water availability situation on the island.

At this stage it is recommended that the lead agency drivers, the Environmental Services Unit of the Ministry of Health and the Ministry for Grenadine Affairs formally engage the Government and donors for financial assistance to mobilize the planning process.

4.2.2 Action 2: Steering Committee (SC) establishment

A Steering Committee (SC) should be installed to direct the process of development of the IWRM Plan through all stages of preparation and to

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ensure that the initiative is both managed effectively and is providing maximum benefit.

The SC should be established at a formal meeting of local Union Island stakeholders under the recommended chairmanship of an official of the District Office and/or the Ministry of Grenadine Affairs.

Terms of reference for the SC: the following are the recommended key tasks for the SC:

- Provide the Process Management Team (PMT) with general guidance and support;
- Review the proposals and reports prepared by the management team;
- Regularly review progress in implementation;
- Assist the PMT in securing primary data and information;
- Be responsible for coordinating and monitoring the implementation of relevant activities within their respective agency, organisation or community;
- Decide on the composition of the PMT and appoint its members.

SC members: The committee needs to include the authorities and institutions involved in decision making in the water sector, together with a selection of other key stakeholders. The eventual make-up must be carefully balanced and requires a commitment at the outset from all participating organisations (government, the private sector and civil society etc) acceptable to stakeholders. The following is a suggested pool of organizations from which the SC can be constituted:

- Ministry of Grenadine Affairs
- Ministry of Health and Environment (Environmental Services Unit)
- District / Revenue Office, Union
- Community Development Office
- Fisheries Department
- Forestry Department
- Ministry of Transport

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- Central Water and Sewerage Authority (including the Solid Waste Management Unit
- Union Island Tourism Board
- Southern Grenadines Water Taxi Association
- Union Island Farmers Organisation
- Union Island Environmental Attackers
- Union Island Museum and Ecological Society
- Lions Club
- Clifton community resident
- Ashton community resident
- Sustainable Grenadines Project
- IWCAM Project National Inter-sectoral Committee representative[4]

Note: There should be allowances made to co-opt persons with specialist knowledge and other contributions and required.

Frequency of meetings: The steering committee should ideally meet once a month until the IWRM Plan is accepted for submission.

4.2.3 Action 3: Process management team (PMT) establishment

The Process Management Team (PMT) acts as a secretariat or coordinating body to the SC. The role of the Team is to translate the requirements of the SC into practical measures for action, while at the same time informing the SC on progress and emerging key issues. The PMT will be responsible for managing the participatory planning process and for guiding the activities required for preparation of the IWRM plan. At the first meeting of the SC the members of the PMT should be determined.

[4] The Global Environment Facility-funded Integrating Watershed and Coastal Areas Management (IWCAM) Project seeks to project aims to demonstrate the development of an effective regional strategy for IWCAM, in parallel with demonstrating and replicating geographically targeted national solutions to common Caribbean SIDS issues, through a series of interconnected components that capture best practices and translate these into replicable actions.

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Terms of reference for the PMT: the following are the recommended key tasks for the PMT:

- Organize and coordinate the overall strategy process;
- Planning specific activities and meetings;
- Procuring expertise and resources (human and financial);
- Support working groups and other committees;
- Act as a focal point for communication.

PMT members: Team members normally include senior planners from relevant sector agencies (for purposes of bringing different perspectives to bear on the planning process) but may be comprised of consultants or seconded staff. It is recommended that at least one administrative assistant is employed full-time (or alternatively an individual assigned/seconded from the local district office) to provide the necessary level of administrative support to the process.

Frequency of meeting: The PMT should meet as frequently as needed but its workings should be reported to the SC ahead of its meetings.

4.2.4 Action 4: Stakeholder involvement plan development and implementation

Stakeholders should be engaged at all levels in the IWRM Plan development process to ensure that the planning process adequately addresses the needs of the diverse resource users. The benefits of stakeholder involvement include:

- Enhancement of informed decision-making as stakeholders often possess a wealth of information which can benefit the project;
- Gaining direct feedback from those most affected by lack of water resources or poor management of water resources;
- Consensus-building at early stages of the project to reduce the likelihood of conflicts which can harm the implementation and success of the project;

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- Contribution to the transparency of public and private actions, as these actions are monitored by the different stakeholders that are involved;
- Building trust between the government and civil society, which can possibly lead to lead to long-term collaborative relationships.

The stakeholder involvement plan calls for the identification of stakeholders, assessment of their interests, their potential contributions to the IWRM process and their relative influence and importance.

Stakeholder assessment: In the initial assessment work carried out for Union Island a stakeholder analysis was conducted. This assessment was based on stakeholder interests, their potential impact on the IWRM development and their relative influence and importance. In the context of Union Island 17 stakeholder groups from both mainland St. Vincent and Union Island have been tentatively identified and analyzed. The results are contained in the matrix in Table 7. This assessment can be reviewed should circumstances change.

Focus group meetings: Although there should be representation on the Steering Committee in the context of a wider consultative forum, smaller interest group dialogue will be necessary. This can be done through focus-group meetings. This is to obtain very specific information regarding issues that need to be taken into account in development of the plan. The outputs of these meetings should be the response from two key questions:

1. What are the foremost issues of concern to stakeholders?
2. What can be done by stakeholders in management of water resources to assist in alleviating problems?

The following are proposed stakeholder groupings with broadly common interests in the context of water management for Union Island:

- Central and local government (including planners)
- Community residents
- Health care, emergency, other social services

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- Fishers and recreational waters users; hospitality sector, water taxi, yachting concerns
- Farmers
- Public utility company
- Educational institutions
- Volunteer groups and service clubs

It is suggested that there be at least one focus group discussion per grouping during the process. It is expected that subsequent follow-up will be required with the groups or individuals in the groups.

The table below is a proposed template that can constitute a stakeholder involvement plan. Similar tables can be created for each stakeholder or group of stakeholders.

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(A) Stakeholder Name:	*Tourism Association*		
(B) Present Stakeholder Priority Influence in water resources management (check one)			
HH – High Priority/High Influence: These stakeholders are the bases for an effective coalition of support for the project ☒	**HL** – High Priority/Low Influence: These stakeholders will require special initiative if their interest are to be protected ☐	**LH** – Low Priority/High Influence: These stakeholders can influence the outcomes the project but their priorities are not those of the project. They may be a risk or obstacle to the project ☐	**LL** – Low Priority/Low Influence: These stakeholders are of least important to the project ☐
(C) Potential role(s) of stakeholder in the IWRM Plan development (list roles below)			
1. Lead stakeholder discussions on the IWRM plan component on recreational water quality management			
2. Policy support in coastal waters management component			
3. Technical support in expert studies			
(D) Level of participation in the IWRM Plan development (check one or more)			
Steering Committee ☒	Process Management Team ☐	One-on-one focus group ☒	Wider consultative group ☒

(E) Consultative schedule and anticipated inputs/contributions by month (over 24-month period)

Activities (extract from IWRM Plan development schedule)	Year 1												Year 2												**Expected contributions**
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Steering committee meeting	■			■		■	■			■			■			■			■			■		■	*Policy guidance*
Focus-group meetings			■						■						■					■					*Facilitate discussions amongst tourism stakeholders*
Expert study on coastal waters management						■																			*Guidance on preparation of terms of reference for coastal zone study*
Expert study on coastal waters management										■															*Participate in review of consultant report*
Development of IWRM messages							■											■							*Contribute to concepts, review materials*

Insert as many additional rows for activities as needed

Sample

Table 8. Stakeholder Assessment Table

4.2.5 Action 5: Communications plan development and implementation

A key element is the development of a Communications Plan. This will set out the process for dissemination of core messages to stakeholders on the importance of IWRM and the need for an IWRM Plan. Implementation of the communications plan should run in parallel to development of the IWRM Plan itself so as to gain buy-in into the process. Effective communications will keep stakeholders engaged through the provision of information on a continual basis. There are a few considerations that must be taken into account when preparing the communications plan.

Define the target audiences: The premise is that since water is of value to all, the target audience will necessarily be civil society at large. However, because stakeholders will traverse a broad spectrum in terms of

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needs, interests and relative involvement and contribution to IRWM, discrete target audiences will need to be recognized also.

Determine key messages: Based on the nature of the target audience the messages will need to be crafted to that they invoke necessary change in meeting the IWRM goals. In the case of Union Island some of the following key messages that need to be emphasized include:

- Importance of good water management, clean environments (generic messages);
- Good practices in securing household RWH water supplies – in the context of vector control;
- Proper management of household waste (liquid and solid waste);
- Livestock control to minimize land degradation;
- Sustainable land management practices with respect to control of soil erosion from construction sites and road-cuts;
- Proper use of agro-chemicals and household chemicals to minimize pollution of freshwaters;
- Proper management of waste oil and sewage from marine vessels to minimize coastal water pollution.

Determine appropriate modes of dissemination: There is a broad range of choice in dissemination of IWRM material. Common forms include:

- Printed material – posters, brochures, leaflets;
- Publications – newspapers, magazines;
- Broadcast features – TV and radio features;
- Radio and television panel discussions, call-in programmes;
- Interviews, news articles;
- On-line publications;
- School debates, art and essay competitions.

Identify partners: There are many options available for Union Island. All umbrella organizations should become involved in spreading messages that are most applicable to their area of influence. The St. Vincent Government Information Service needs to be involved in assisting this effort. The schools on Union Island should be specially targeted as a way

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to build attitudinal change from a young age, as an investment in the future.

The development and implementation of the communications plan may require recruitment of a communications specialist. The SC should develop and approve the terms of reference for such a specialist.

Finally, surveys should assess the sensitivity of target audiences to IWRM concepts prior to, and after the public awareness and outreach interventions. Simple polls should seek to establish whether or not messages have been heard, the degree to which messages heard/seen are correctly interpreted and the extent to which there have been changes in behaviours as a result of the messages.

The following is a proposed template of a communications plan for IWRM. Please note that there may be several ways in which a Communications Plan is presented. The format presented is intended as a guide may be modified as appropriate.

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Communications Plan template

Part 1: Introduction: This should include a brief description of the current situation with respect to IWRM in the country and the key issues that need to be addressed in an IRWM Plan. This material may be derived from the IWRM situational analysis.

Part 2: Objectives: This section should state the main objectives to be achieved as a result of execution of the Communications Plan. Keep the number of objectives to no more than 4 or 5.

Part 3: Key Messages, Primary target audiences, Format, Release schedule and Cooperants: *(Note: the information below will need to be replicated for each key message theme)*

Key message: This is the primary theme that is to be highlighted. These messages should be of high impact addressing the issues of highest priority.

Primary audience: Given the diversity of potential target audiences the messages should be crafted appropriately depending on the primary audience being targeted. Messages in simple language are best for general public audiences. More technical language may be used for professional public and private sector specialists; however keep the message focused.

Format: List the range of media that the message will be conveyed in. This should specify products such as brochures, posters (along with size formats); video and radio features (whether short public service announcement or feature-length, along with specifications on duration, sound bytes, imagery).

Release schedule: Identify the proposed timing of release by month during the preparation of the IWRM Plan.

Cooperants: Identify the key persons, organizations that will be involved in preparation, facilitation and dissemination of the particular message.

Part 4: Proposed budget: The estimated cost for production and dissemination of the various media products must be specified.

Other on-line resources on preparation of Communications Plans:

International Development Research Centre: http://www.idrc.ca/en/ev-48400-201-1-DO_TOPIC.html#three

Washington State Department of Information Services: http://isb.wa.gov/tools/pmframework/planning/communications.aspx

Table 9. Communications Plan Template

4.2.6 Action 6: Situational Analysis and IWRM Plan Framework

The purpose of the situational analysis is to examine the existing water resources management system in terms of the IWRM principles and the goals of sustainable management and development. The situational

analysis should examine the quantity and quality of both surface and groundwater, as well as the potential for utilising unconventional sources emanating from reclamation, re-use, recycling, desalination and water demand management. It should identify the pertinent parameters of the hydrological cycle, and evaluate the water requirement of different development alternatives.

Impacts on terrestrial (forests) and aquatic ecosystems (e.g. mangroves and coral reefs) as a result of water use, and waste water disposal/management should also be considered. Socio-economic aspects need to be assessed in terms of looking at the impacts of the present water management system on society as a whole. The analysis should pinpoint potential conflicts, their severity and social implications, as well as risks and hazards posed by flood and drought occurrence.

Profile of expert studies required: There are a series of situational analysis-type research activities that need to be carried out to properly inform the IWRM Plan. While some of this data was captured in the preliminary assessment carried out in April 2007, more in-depth work is required. Some of the expert studies that are required include:

1. Analyze the current institutional and legislative arrangements for water resources management and propose appropriate alternative arrangements for Union Island. This must include recommendations for human and institutional capacity enhancement;
2. Quantify total water storage capacity by household, commercial enterprise (including hotels) and determine future water demand based on developmental trends and forecasts;
3. Explore the feasibility of alternative water augmentation measures for Union Island. This must take stock of existing water resources on the island through a hydrological and hydrogeological survey;
4. Analyze risks associated with extreme climate events to water security and access to water resources. This should be framed in

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context of climate change impacts (sea level rise and salt water instruction, increased erosion and flooding, changes in rainfall for harvesting);

5. Determine water quality and environmental health of community and household RWH systems, establish health and sanitation risk and propose appropriate vector control measures;
6. Determine the feasibility of implementation of cost recovery measures for development and maintenance of water infrastructure;
7. Establish appropriate benchmarks and indicators for monitoring fresh and coastal water quality. Monitoring protocols must be defined;
8. Quantify relative risk to upland and coastal/marine ecosystems from land-based sources of pollution and propose mitigative measures.

Assistance should be sought to flesh out terms of reference for these studies from relevant national agencies and regional support agencies.
It must be noted that for all studies a costed programme for implementation (where relevant) must be included, along with proposals on the most appropriate methods for funding.

4.2.7 Action 7: Vision Statement and Goals Articulation

Vision and policy statement: As a statement of intent the vision is the starting point to articulation of the IWRM plan. The vision statement for IWRM is an expression of society's aspirations in how they may benefit from good water resources management. The vision becomes the context in which a water resources management policy statement is framed. A water resource management policy statement is a written statement that affirms government's commitment to sustainable use and development of national water resources.

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There is no specific vision or policy statement for integrated water resources management at the national level (including Union Island). An initial community stakeholder meeting held in April 2007 (previous section) revealed issues that can form the basis of the vision statement for IWRM in Union Island. The specific elements of a vision statement for Union Island should include references to:

- Secure access to a safe and reliable water supply for all residents;
- Minimal pollution of coastal marine resources through effective control and abatement of land-based sources of marine pollution;
- The management of water resources on Union Island must be a participatory process between stakeholders;
- Governance of water resources on Union Island must be in keeping with national development goals and objectives.

It is recommended that with the formal constitution of an IWRM Steering Committee that a comprehensive vision statement be articulated. A national water resources policy statement for St. Vincent and the Grenadines is beyond the scope of this roadmapping exercise; however the lack of a national policy does not preclude Union Island's pursuit of a plan for management of its water resources. It is anticipated that the IWRM planning process for Union Island will be fully congruent with any policy statement that is eventually formulated for the country.

It is suggested that the vision statement be time-bound to within a reasonable timeframe. It is recommended that the vision horizon be framed to within 15 and 20 years.

Goals articulation: The IWRM Plan needs to be based on three main components or pillars. These are (1) the Enabling Environment, (2) Institutional Roles and (3) Management Instruments. Under these pillars are specific **'IWRM change areas'**. There are 13 specific change areas that can be readily identified that suggest directions to be taken to move from

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the present water resources management situation to the alternative, as defined under the Plan. It should be noted that the many of the issues raised by Union Island stakeholders (at the April 2007 consultation) in Part 2 speak to several of these change areas. Achieving change under these IWRM pillars are realized by discrete **goals**.

The goals describe how the vision might be achieved. Each goal should cover a given issue (problem or opportunity) and address the main changes required to make the transition to sustainable development. The goals must be expressed in a way that is broad enough to encompass all aspects of the issue and ensure 'buy-in' by all relevant stakeholders, but also specific enough to allow measurable targets to be defined.

The following offers an explanation of the three IWRM pillars, associated change areas and suggested IWRM goals.

Pillar 1: The Enabling Environment: This includes policy, legislation, and financing systems. Legislative processes take a long time, frequently several years and changes are cumbersome. Legislation often lags behind in terms of responding to the dynamic changes in the water resources situation and the society. Typically, laws and associated regulations that impact water resources management are resident within different sectors, prepared by different agencies at different points in time and are often uncoordinated in implementation. The overall goal for a legal reform process is to ensure that the key policy aims can be pursued with a legal backing and that there is consistency in laws and regulations across all sectors that impact water resources.

There are <u>three</u> main change areas to be addressed under Pillar 1. These are:

1. <u>Policies:</u> setting goals for water use, protection and conservation.
2. <u>Legislative framework:</u> the rules to enforce to achieve policies and goals.

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3. Financing and incentive structures: allocating financial resources to meet water needs.

Key goals of the IWRM Plan for making changes to the enabling environment include:

- Establishing government as the "owner" of all water resources and a selected ministry as a water resources management authority and regulatory agency (there will be exceptions for RWH systems and package propriety desalination plants);
- Recognition of relevant international conventions and agreements related to water;
- Setting out effective water allocation mechanisms including decision support for prioritisation; e.g. domestic use and environmental flows as first priority;
- Setting out mechanisms for pollution management in harmony with the environmental laws and regulations, e.g. classification of water bodies, discharge standards and monitoring standards;
- Providing legal basis for institutional reform, e.g. management on a catchment basis, water resources committees;
- Regulating management protocols during crisis conditions e.g. water shortages, flood and pollution emergencies;
- Making provision for cost recovery, charges, incentives and financing arrangements to assist sustainability of water resources management initiatives;
- Setting out provisions for enforcement and for sanctions in cases of non-compliance.

Pillar 2: Institutional Roles: The government institutions, agencies, local authorities, private sector, civil society organisations and partnerships all constitute an institutional framework that ideally should be geared towards the implementation of the policy and the legal provisions. Whether building of existing water management institutions or forming

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new ones a challenge will be to make them effective and this requires capacity building. Awareness creation, participation and consultations should serve to upgrade the skills and understanding of decision-makers, water managers and professionals in all sectors.

There are two main change areas to be addressed under Pillar 2. These are:

4. Creating an organizational framework: forms and functions.
5. Institutional capacity building: developing human resources.

Key goals of the IWRM Plan for making changes to institutional roles include:

- Separate water resources management functions from service delivery functions (irrigation, water supply and sewerage) such that service provision is not being provided by the same body responsible for regulation[5]. This will avoid conflicts of interest and encourage commercial autonomy;
- Manage surface water resources within the boundaries of a catchment, not within administrative boundaries, decentralising regulatory and service functions to the lowest appropriate level and promoting stakeholder involvement and public participation in planning and management decisions;
- To ensure balance between the extent and complexity of regulatory functions and the skills and human resources required to deal with them. A continued capacity building program is required to develop and maintain the appropriate skills.
- To facilitate, regulate and encourage private sector potential contributions in financing and delivery of services (irrigation, water supply and sewerage)

[5] In the case of larger countries it is recommended that resource regulation and service provision be separated, with service provision relegated to non-governmental commercial interests. In SVG and Union Island this arrangement is not foreseen at this time. The State will continue to remain the national service provider (through the CWSA) and regulator.

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Pillar 3: Management Instruments: The policies and legislation sets out the "game plan", the institutional roles defines who the "players" are and what they should do, while the management instruments are the "players´ competencies and skills" needed to play the game. The water resources issues in the particular country decides which management instruments are most significant and where efforts should be concentrated. Issues such flood risks, water scarcity, pollution, groundwater depletion, upstream/downstream conflicts, erosion and sedimentation all require their special combination of management tools to be effectively addressed.

There are eight main change areas to be addressed under Pillar 3. These are:

6. Water resources assessment: understanding resources and needs;
7. Plans for IWRM: combining development options, resource use and human interaction;
8. Demand management: using water more efficiently;
9. Social change instruments: encouraging a water-oriented civil society;
10. Conflict resolution: managing disputes, ensuring sharing of water;
11. Regulatory instruments: allocation and water use limits;
12. Economic instruments: using value and prices for efficiency and equity;
13. Information management and exchange: improving knowledge for better water management.

Key goals of the IWRM Plan for making changes to management instruments include:

- Establish a hydrological and hydro-geological service tailored for the water resources situation and the key water resources issues (any system for Union Island should be part of a wider national network);

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- Establish a water resources knowledge-base based on monitoring and water resources assessments, supplemented by modelling if necessary and make relevant components and outputs available as part of public awareness raising;
- Establish a water allocation mechanism, supported by a surface water, groundwater abstraction and wastewater discharge permit system and associated databases (although surface waters in the context of perennial streams may not apply to Union Island, provisions should be made; possible applicable to surface ponds);
- Establish policy and planning capabilities and develop skills in risk, environmental, social and economic assessment;
- Establish competencies in demand management and in use of prices and value for efficiency in use and equity in access;
- Establish human resources development and capacity building tailored to the water resources and institutional issues.

Setting targets: It is important in the implementation of the IWRM Plan that the measure of achievement of the goals be quantified. Targets for each goal describe *specific* and *measurable* activities, or accomplishments to be achieved by given dates. The targets assist in focusing resources and guiding the selection of options for action. Because targets imply concrete actions and behaviour changes by specific stakeholders, they should be arrived at in a participatory manner with agreement amongst stakeholders.

Maintain political engagement: Political commitment must be maintained throughout the planning process but at this stage resistance may arise if there are any threats to power and major changes in institutional arrangements being proposed. Close consultation and cooperation with affected and interested ministries at the highest level is important to maintain during the drafting of the plan.

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4.2.8 Action 8: Evaluate IWRM Plan options

The nature of the water resources management issues to be addressed in Union Island will determine the options to be pursued under the IWRM Plan. It must be recognized that for a small island developing state like St. Vincent and the Grenadines financial and human resources are limited. Therefore creative solutions will need to be explored in gaining as broad-based involvement as possible in eliciting change in the water resources management framework; the view that central government is the sole implementer of IWRM processes must be changed to involve partnership and involvement by private sector stakeholders and civil society.

The following are some key principles which can assist in strategy selection:

- **Maximise use of existing capacity**: Wherever possible, make use of existing capacity within existing institutions rather than establishing new institutions. Focus should be on strengthening of existing institutions both on mainland St. Vincent and on Union Island.
- **Create co-ordinating mechanisms**: It may be appropriate to create one "coordination unit" (or another suitable mechanism) which co-ordinates the involvement of stakeholders and ministries in strategy selection, planning and execution of the IWRM Plan. Creation of suitable mechanisms for IWRM coordination should be explored at the national level with counterpart mechanisms for Union Island.
- **Knowledge management**: Good co-ordination should facilitate and maximise the learning across and between institutions, programmes and plans (such as poverty reduction strategies, water and sanitation programmes, environmental programmes) and consequently enable more efficient use of resources.

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Assessment of the planning process: During development of the Plan the following cross-cutting considerations should be examined to determine whether the Plan sufficiently addresses key developmental and environmental issues:

Consideration 1: Reducing Poverty

Will the Plan help to:

- expand access to water for productive uses: for example through groundwater development, affordable small-scale technologies, and multiple-use supply systems?
- respond to poor people's water needs?
- develop the most appropriate services given users' needs, their ability to pay, and their capacity to manage and maintain infrastructure?
- address people's water needs for farming, livestock rearing, fisheries, and cottage industries?

Consideration 2: Addressing Water Scarcity and Competition for Water

Will the Plan help to:

- allocate water strategically?
- improve water efficiency and promote demand-side management?
- encourage the development of non-conventional water resources?

Consideration 3: Improving the Situation of Women

Does the Plan give increased attention to:

- providing nearby access to good quality water for drinking and domestic use?
- income-generating activities of women requiring water?
- water rights for women?
- anchor women's issues strategically in water-related institutions and programs?
- involve women in the dialogue on water and to ensure that their views and needs are heard?

Consideration 4: Protecting Ecosystems

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Does the Plan address:

- allocation of water for environmental flows?
- management of water to meet the water timing and quality needs of ecosystems, as well as the quantity?
- how to value the goods and services ecosystems provide?
- control of water pollution?
- impact of freshwater management on coastal and marine environments?
- the sustainable use of groundwater?

Consideration 5: Human Health

Does the Plan actively support:

- better water development and management to reduce water-related diseases such as dengue fever and diarrhoeal diseases, and other diseases such as leptospirosis that are introduced into waters supplies due to contamination by harmful vectors?
- improvement of sanitation in urban and rural areas?
- sustainable delivery of water and sanitation services for the poorest populations?

Consideration 6: Economic Development

Does Plan strategy:

- allocate water between sectors in a way that encourages economic development, while also considering poverty reduction and environmental sustainability goals?
- create a macro-economic environment conducive to good water management?

4.2.9 Action 9: IWRM Plan promotion, adoption and implementation

After completion of the plan, it needs to be accepted by the all stakeholders including government. It makes no sense to spend all the

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resources on developing a plan that is rejected at the end or never to be implemented. That is why political and stakeholder participation from the onset of the process of developing an IWRM plan is so important. If the participation process lived up to expectation, then approval should not be problematic.

It needs to be decided at the first stakeholder meeting what the conditions of acceptance of the IWRM Plan would be. In this way, unfolding outcomes from the process can be assessed against initial conditions from acceptance, and adjusted accordingly if required.

Agreeing on the conditions of what the process to develop the plan and what the content of the plan should be in the beginning enhances the change that the plan will be approved by stakeholders and Government. If all the stakeholders (including Government) have been involved in the development of the plan from the very beginning, approval should be a mere formality. During the entire process, implementation of the Communications Plan is critical to keep stakeholders engaged and informed.

Upon receipt of the final draft of the Plan at the close of the process, a national-level stakeholders forum be convened to discuss and endorse the Plan. This is to be followed by ratification by the Cabinet of Ministers of behalf of Government.

4.3 A proposed template for an IWRM Plan for Union Island

The IWRM Plan for Union Island should be forward-looking over a medium to long-term period, perhaps over 10 years. It is suggested that the Plan addresses the short to medium-term actions in detail over the first 5 years, with indicative activities in the longer term.

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Main elements of an IWRM Plan for Union Island: At the minimum the IWRM plan should address the following elements listed below. It must be stressed that there is no formally established template for preparation of an IWRM plan, so stakeholders may modify the proposed structure as they see fit.

- **Existing water resource management approach:**
  - Where it came from, how long has it been in place, what legal instruments (policies, laws and institutions) supports it, and what are the constraints of the current approach to water management.

- **Current water resources situation:** (a water resource assessment) that addresses the following issues:
  - Rainfall distribution, characteristics of the major drainage ways, ponds, community catchments, household catchment systems, etc. Essentially a description of where the water is and where it is not;
  - Characterization of coastal water resources;
  - Identification of the nature and causes of the water resource problems and discernable trends;
  - The water uses and who are the users, how much do they use and for what purposes;
  - The current social and institutional arrangements regarding water management;
  - A description of floods and droughts, the frequency of occurrence as well as the extent of flood and drought events;
  - Water conservation and demand management strategies currently in place;
  - A description of "other" water sources (desalination, recycling, etc) in use;

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- Issues that have been raised by stakeholders during the participation process;
- Analysis of the problems.

- **Scope of the IWRM plan:** This will encompass the vision for water management, along with the medium and long term goals, aims and objectives to be attained by the IWRM Plan. A section on the ownership-building process needs to be included that specifies:
  - Participatory process used to build ownership for the plan;
  - Summary of the major issues raised during the participatory process;
  - Impacts of the participatory process on the content of the plan.

- **Implementation Strategy:** A description of how the goals of the plan are to be achieved. The specific aspects to be included are:
  - Clear priorities for action relevant to the goals and targets – must be feasible in the context of the diagnosis, the targets, their estimated costs, available resources, institutional capacities and effectiveness of past policies;
  - Slate of actions to be achieved under the three IWRM pillars;
  - Appropriate indicators of progress;
  - Appropriate annual and medium term targets.

- **Linkages of the IWRM Plan to other national processes and/or plans:** How relevant is the IWRM Plan to the national Poverty Reduction Plan, National Development Plan, etc.

- **Resource requirements:** This is an estimate of the financial requirements to implement the plan over its life-span. Cost estimates should be more detailed for short-term priority actions, while for more long-term actions indicative costs should suffice.

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- **Sustainable monitoring and evaluation systems:** The measures to be adopted to determine the extent to which the goals are being achieved. The Global Environment Facility (Duda, 2002) has published material on indicators that can be monitored.

4.4 Workplan and Indicative Cost Estimate

Table 10 is a summary of the action items envisaged in the formulation of the IWRM Plan, their indicative associated costs and timeframes for implementation. While it is recommended that a funded, dedicated Secretariat be established to oversee the IWRM Plan development process, this may not be necessary if the lead local agency is able to integrate this process within its own work programme. The process is (conservatively) estimated to run over a two-year period at a cost of US$ 50,300. If a funded secretariat is included within the cost estimate at an additional US$ 33,500, the overall cost will stand at US$ 83,800.

It is recommended that funding proposals to advance the IWRM Plan development process for Union Island utilize the costs presented in this roadmap as the basis for planning. It must be noted again that the costs presented in Table 10 are indicative, and that they were based on collective experience in hosting dialogues and consultations, and procuring technical services for studies that are envisaged in this particular exercise. More detailed cost estimates should be developed when full financing proposals are prepared.

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Table 10. Union Island IWRM Plan development Time Schedule and Indicative Cost Estimate

Key activities by Action area		Lead Responsibility	Estimated Cost (US$)	Description of cost breakdown	Year 1				Year 2			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Action 1: Process initiation												
1.1	Initial national stakeholder consultation	ESU, MoGA	n/a	Completed; work between CEHI and local collaborators								
1.2	Union Island local level consultation	DO	n/a	" "								
1.3	Procurement of financing for plan development	DO, ESU	n/a	" "								
		SUB-TOTAL	**0**									
Action 2: Steering Committee (SC) establishment												
2.1	Draft TORs for Steering Committee	SC	$500	Consultancy services: can also undertake actions 2.1, 3.1, and 3.2								
		SUB-TOTAL	**$500**									
Action 3: Process management team (PMT) establishment												
3.1	Draft TORs for Project Management Team	SC	$500	Consultancy services - See action 2.1								
3.2	Identify/recruit members of PMT	SC	$500	Consultancy services - See action 2.1								
		SUB-TOTAL	**$1,000**									
Action 4: Stakeholder involvement plan development and implementation												
4.1	Focus group meetings	SC, PMT	$300	Venue cost, catering, printing costs, other logistics								
4.2	Compilation of findings	PMT	$350	Consultancy services								
4.3	Stakeholder reviews	PMT	$350	Consultancy services								
		SUB-TOTAL	**$1,000**									

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Key activities by Action area		Lead Responsibility	Estimated Cost (US$)	Description of cost breakdown	Year 1				Year 2			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Action 5: Communications plan development and implementation												
5.1	Development of messages	SC	$200	Consultancy services								
5.2	Recruit communications specialist	SC, PMT	$0									
5.3	Professional services - development of awareness material)	PMT	$2,000	Consultancy services								
5.4	Stakeholder reviews	PMT	$500	meetings, etc								
5.5	Identify partners (possibly through MOUs)	SC, PMT, ESU										
5.6	Production of materials	PMT	$3,000	professional production services								
5.7	Dissemination of awareness materials & messages	SC, PMT, GIS	$500									
		SUB-TOTAL	**$6,200**									
Action 6: Situational Analysis and IWRM Plan Framework												
6.1	Preparation of TORs for expert studies	SC, PMT, ESU	$500	Consultancy services								
6.2	Recruit specialist for key studies	SC, PMT										

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Key activities by Action area		Lead Responsibility	Estimated Cost (US$)	Description of cost breakdown	Year 1				Year 2			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
6.3	Execute studies	PMT	$32,000	**Consultancy services - Technical studies: allocate on average US$4,000 for each study** 1. Institutions / Legislation / Capacity 2. Total water storage capacity and future water demand (Possible EU Water Project co-financing) 3. Alternative water augmentation measures feasibility (including hydrological and hydro-geological survey) 4. Climatic change and variability risk assessment (Possible SPACC co-financing) 5. RWH system water quality and community environmental health 6. Cost recovery measures re: water infrastructure 7. Establishment of monitoring benchmarks, indicators, and protocols 8. Land-based sources of pollution and mitigation measures								
6.4	Compilation of findings	PMT		This would be included in 6.3								
6.5	Presentation to stakeholders	SC, PMT	$500	Logistics, refreshments, copies, etc.								
		SUB-TOTAL	**$33,000**									
Action 7: Vision Statement and Goals Articulation												
7.1	Recruitment of consultant to prepare IWRM Plan	SC, PMT	$6,500	Consultancy services								
7.2	Stakeholder consultation - vision and goal setting	SC	$200	Logistics, refreshments, copies, etc.								
7.3	Focus group meetings - specific information inputs	SC, PMT	$200	" "								
7.4	Compilation of Findings	PMT	$200	" "								
7.5	Stakeholder review consultations - draft Plan review	SC, PMT	$500	" "								

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Key activities by Action area		Lead Responsibility	Estimated Cost (US$)	Description of cost breakdown	Year 1				Year 2			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		SUB-TOTAL	**$7,600**									
Action 8: Evaluate IWRM Plan options												
8.1	Stakeholder review consultations - draft Plan review	SC	$500									
		SUB-TOTAL	**$500**									
Action 9: IWRM Plan promotion, adoption and implementation												
9.1	Presentation at national level - broader stakeholder group	SC, ESU, DO, MoGA	$500	Public awareness, logistic, copies, etc.								
9.2	Presentation and ratification at Cabinet level	SC, ESU, DO, MoGA										
9.3	Commencement of implementation											
		SUB-TOTAL	**$500**									
		TOTAL	**$50,300**									

Management of the PMT (secretariat)			
1	Staff (Head of Unit, Technical / admin support)	$20,000	
2	Office rental	$4,000	
3	Utilities	$3,500	
4	Office equipment and Consumables	$6,000	
	TOTAL	**$33,500**	

GRAND TOTAL (US$) $83,800

Key:
SC – Steering Committee
PMT – Project Management Committee
ESD – Environmental Services Unit, Ministry of Heath and Environment
DO – Union Island District Office
MoGA – Ministry of Grenadine Affairs
GIS - Government Information Services

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Conclusions

A Road Map that lays out the process toward development of an IWRM Plan for Union Island is presented. Union Island was selected as a pilot to demonstrate the IWRM development process on a small water-scare island that is representative of the northern Leewards, the Virgin Islands, the Bahamas and the Turks and Caicos Islands. Regional and international development partners that include the Caribbean Environmental Health Institute, the GEF-funded Integrating Watershed and Coastal Areas Management Project, the Global Water Partnership, the United Nations Environment Programme Collaborating Centre for Water and Environment and the National Oceanic and Atmospheric Administration among others, are committed to assisting the Caribbean region develop Integrated Water Resources Management Plans over the next several years.

Union Island is small with a small population, where water is a scarce commodity due to the low rainfall regime. All of the water consumed is gathered using rainwater harvesting techniques. Major issues to be addressed in management of water resources include increasing the availability of water through improved and expanded harvesting and storage (and use of alternative technologies where feasible), control of harmful vectors and water-borne diseases, and mitigation of land-based sources of coastal water pollution.

Initial meetings were held with stakeholders on Union Island to gain a sense of the severity of the problems and a preliminary assessment was conducted to determine the strategic directions for development of the IWRM Road Map that is to be used to guide the process toward development of an IWRM Plan for Union Island.

The road map, based on the framework for IWRM development proposed by the Global Water Partnership and Cap-Net, envisages an IWRM

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development process that runs over a two-year period and calls for 9 Action Areas. These are:

1. Process initiation;
2. Steering Committee (SC) establishment;
3. Process management team (PMT) establishment;
4. Stakeholder involvement plan development and implementation;
5. Communications plan development and implementation;
6. Situational Analysis and IWRM Plan Framework;
7. Vision Statement and Goals Articulation;
8. Evaluate IWRM Plan options;
9. IWRM Plan promotion, adoption and implementation.

It is proposed that the process is led by a multi-stakeholder steering committee that is formally constituted under the joint aegis of the Ministry of Grenadine Affairs through the local District Office for Union Island and the Ministry of Health and the Environment through the Environmental Services Unit.

The estimated cost for the development of the IWRM Plan for Union Island is US$83,800. This is inclusive of a US$33,500 cost for administration of the process through a dedicated secretariat. However if the IWRM Plan development is undertaken within the work programme of the local lead agency (as co-financing contribution) the cost estimate stands at US$50,300. Of this cost approximately 66% will go toward the further technical studies and recommendations that will form the basis for the IWRM selected options. Any on-going or planned work under other related initiatives that advance the elements of the IWRM roadmap should be considered as contributory (with the funding regarded as co-financing) toward the preparation of the IWRM Plan.

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Annex

Information Template for Developing IWRM Roadmaps and Plans in Caribbean SIDS

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Section A

1 Key Terms in Integrated Water Resources Management

2 Guidelines for Completing the Information Template

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Section B

Reporting Country:

Completed By:

Date Completed:

1 PROCESSES AND MILESTONES LEADING TOWARDS IWRM

A. NATIONAL WATER RESOURCES MANAGEMENT VISION					
What is the National Water Resources Management Vision for your Country?					
What level of support is there for the Vision at:	**Very High**	**High**	**Medium**	**Little**	**None**
Political					
High Level Policy/Decision making					
Technical					
Key Stakeholders					
General Population					
What level of awareness is there for the Vision at following Levels:	**Very High**	**High**	**Medium**	**Little**	**None**
Political					
High Level Policy/Decision making					
Technical					
Key Stakeholders					
General Population					

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B. AWARENESS ON IWRM

What is the level of awareness on the Philosophy, concepts, principles and practices of IWRM for the following groups:

(Please use a rating of 0 = none; 1 = to a little degree; 2 = to a reasonable degree; 3 = fully)

Stakeholders	**(Check (✓) the rating that best applies)**			
	0	**1**	**2**	**3**
➢ National level politicians				
➢ Local level politicians				
➢ High level policy/Decision Makers (National Level)				
➢ Decision makers in agencies responsible for water resources management				
➢ Decision makers in agencies within the water use and water related sectors				
➢ Professionals in agencies responsible for water resources management				
➢ Professionals in agencies within the water use and water related sectors				
➢ Major Water Users (Industry, Agriculture, Tourism etc)				
➢ NGOs in the water sector				
➢ CBOs in the water sector				
➢ Local/community level decision makers				
➢ Water sector consultants				

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C. IWRM PLAN				
Is there a National Water Plan? (Check (✓) the appropriate one)				
	✓			
Existing			Date of Approval:	Title:
Being Developed			Est. Completion Date:	
To be developed in the near future	✓		Est. Start Date:	
No decision on its development				

If Plan Exists			
Who were the main stakeholders involved in it preparation?			
Who has responsibility for coordinating its implementation?			
Who has responsibility for M&E?			
	Yes	**No**	**Comment**
Is there a portfolio of projects to implement the Plan?			
Is there a programme for capacity building?			
Is there a strategy for sustainable financing of the Plan?			

D. NATIONAL PROGRAMMES AND PROJECTS

Are there Programmes and Projects that may impact on IWRM?

Name of Programme/ Project	**Focus of Programme/ Project**	**Area of focus on IWRM**	**Harmonized with Water Policy/Plan**		**Agencies Responsible for Implementation**	**Funding Source**	**Comments**
			Yes	**No**			
Existing Programme/ Project							

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Being Developed/ Contemplated							

E. OTHER NATIONAL PLANS THAT ARE LIKELY TO CONTRIBUTE TO IWRM						
Are there other Plans that may impact on IWRM?						
Name of Plan	**Focus of Plan**	**Area of focus on IWRM**	**Harmonized with Water Policy/Plan**		**Agencies Responsible for Implementation**	**Comments**
			Yes	**No**		
Existing Plan						
Being Developed						

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Being Contemplated						

F. CONTEXT FOR IWRM PLANNING	
What mechanisms are in place for interaction with stakeholders at the national level?	
What mechanisms are in place for interaction with stakeholders at the local/community level?	
How have other National Plans been established?	
What are the decision-making arrangements for strategies and plans within different ministries?	
Who will need to endorse an IWRM Plan?	
Which government ministry and/or designated agency will have the central role to play in the development of the IWRM Plan	
What are the levels of support for the IWRM Philosophy at the political level?	
What are the levels of support for the IWRM Philosophy at the policy/technical levels?	
What are the levels of support for the IWRM Philosophy at the general population level?	
What is the level of political will in ratifying and implementing regional or international obligations related to water resources management?	
What are the key issues or concerns related to Water Resources management?	
Is there political support to develop a holistic IWRM Plan, or is it necessary to focus on one or two key topics?	
Are there interested parties in government to develop an IWRM Plan?	
What are the likely resources available to develop an IWRM Plan?	
Which areas of action will be able to attract sustainable forms of financing?	

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G. CHALLENGES AND CONSTRAINTS TO IWRM				
Challenges/Constraints **(Rate the following challenges/constraints using the following:** **0 = Not relevant; 1 = Not Severe; 2 = Severe; 3 = Very Severe)**	**Rating (Check (✓) the rating that best applies)**			
	0	**1**	**2**	**3**
Lack of Good Water Governance				
Fragmented Approach to IWRM:				
Multiple institutions, each with their own piece of legislation and Mandate, none of which is broad and deep enough				
Assign responsibilities for planning; management and operations affecting quantity to units separate from those responsible for quality management				
➢ Poorly defined responsibilities for departments/section				
➢ Overlap of responsibilities, resulting in duplication				
Cost trade-off between the pollution control and water supply treatment in the same watershed is not evaluated, thus the national investment policies and programmes do not reflect the interrelationships between quality and quantity.				
Lack of effective integration and coordination hampered by:				
The absence of sound and comprehensive national policies on water resources				
The multiplicity of institutions that deal with the management of the resources				
The multiplicity of laws, each dealing with separate aspects of the management of the resources, thus encouraging compartmentalization				
Institutionally divided approach to dealing with environment and development				
Poor management of the dynamics of water supply and demand.				
Inadequate legal and regulatory frameworks for managing the resources.				
The absence of a credible framework for involving civil society in the management process				
The lack of a proper understanding and awareness of the principles of sustainable development and an appreciation of the inseparable linkages between environmental, social and economic issues.				
Institutional arrangements for integrated water resources management are weak/ non-existent.				

Lack/inadequate institutional resources				
Lack/inadequate human resources				
Inadequate of equipment				

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Inadequate financing				
Weak technical capabilities/lack of a critical mass for water resources management				
Inadequate Research and Technology				
Inadequate Data and Information Management Infrastructure				
Conflict between water supply and demand				
Poor land use planning and soil management in watersheds				
Poor pollution prevention and control				
Limited/poor Stakeholder Participation				
Limited/little Public Awareness and Education				
Lack of Promote the economic, social and ecological values of water				
Impact of Climate Change and Sea level Rise				

2 WATER POLICY

A. POLICY ENVIRONMENT				
Is there a National Water Policy? (Check (✓) the appropriate one)				
	✓			
Existing			Date of Publication:	Title:
Being Developed			Est. Completion Date:	
To be developed in the near future			Est. Start Date:	Expected Period for Preparation:
No decision on its development				

B. POLICY COVERAGE		
Area of Coverage (Check all that are relevant)	✓	**Comment**
Water Resources Management		
Water Supply and other Uses		
Promotes the principles of IWRM		
Defines IWRM		
Identifies roles for the Private Sector and Civil Society (NGO, CBO, others)		
Promotes the Polluter pays principle		

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Promotes the user pays principle		

C. OTHER POLICIES IMPACTING ON IWRM					
Are there other policies that may impact on IWRM?					
Name of Policy	**Area of Focus of Policy**	**Area(s) of focus on IWRM**	**Harmonized with Water Policy**		**Comments**
			Yes	**No**	
Existing Policy					
Being Developed					
Being Contemplated					

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3 NATIONAL WATER LEGISLATION

A. WATER LEGISLATION				
Is there one or more specific Water Laws/Water Code? (Check (✓) the appropriate one)				
	✓			
Existing			Date of Publication:	Title:
Being Developed			Est. Completion Date:	
To be developed in the near future			Est. Start Date:	Expected Period for Preparation:
No decision on its development				

This legislation would have limited application in Union as there water more an individual concern

B. COVERAGE OF EXISTING OR PROPOSED WATER LAWS		
For Existing or Proposed Water Laws give the Areas of Coverage (Check (✓) all that are relevant)	✓	**Comment**
Public Hearings		
Stakeholders Participation in IWRM		
Principle of Subsidiarity (Management at the lowest appropriate level)		
Separation been resources management and water service provision		
Participation of Women and other Vulnerable Groups in IWRM		
Private Sector and Civil Society (NGO, CBO, others) participation in IWRM		
Promotes the Polluter pays principle		
Promotes the user pays principle		
Water Use Efficiency		

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C. REGULATIONS SUPPORTING THE EXISTING WATER LAWS					
Title of Regulations	**Focus of the Regulations**	**Are these Effective? Check (✓) the response that best applies**			**Comment**
For those Regulations that are not or some what effective, check (✓) one or more of the following reasons					
Reasons				**Comment**	
Regulations insufficiently known by users					
Regulations insufficiently known by the enforcers					
Too complicated to be operational					
Regulations contradict each other					
Sanctions not applied in cases of non-compliance					
Sanctions are inadequate					
Enforcement capacity inadequate					
Monitoring capacity inadequate					
Regulations conflict with traditional, social and cultural norms and values					
Regulations conflict with other laws					
Other:					

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D. OTHER LEGISLATION IMPACTING ON IWRM						
Are there other Legislation that may impact on IWRM?						
Name of Legislation: (Title, No. and Year)	**Focus of Legislation**	**Area of focus on IWRM**	**Harmonized with Water Laws**		**Agencies Responsible for Implementation**	**Comments on effectiveness of the Monitoring, enforcement and resource allocation**
			Yes	**No**		
Existing Legislation						
Being Developed/ Contemplated						

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4. INSTITUTIONAL FRAMEWORK FOR THE WATER SECTOR

A. REGIONAL AND INTERNATIONAL ENVIRONMENT	
What are the driving forces for action at the international level?	
What are the driving forces for action at the regional level?	

C. INSTITUTIONAL AND ADMINISTRATIVE FRAMEWORK		
Which Institution has lead responsibility for IWRM?		
Name of Institution	**Mandate**	**Key Responsibilities for IWRM**
Which other Institutions have some responsibilities for IWRM?		
Name of Institution	**Mandate**	**Key Responsibilities for IWRM**

C. INTER-SECTORAL COORDINATION					
Are there any inter-ministerial commissions, committees or coordinating mechanisms among the institutions involved in IWRM?					
Name of Committee	**Secretariat**	**Mandate**	**Composition of Committee**	**Frequency of Meetings**	**Comments**
Are there any inter-ministerial commissions, committees or coordinating mechanisms among the institutions whose work may impact on IWRM?					
Name of Committee	**Secretariat**	**Mandate**	**IWRM Representation**	**Area of Focus on IWRM**	**Frequency of**

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					Meetings

D. CAPACITY FOR WATER RESOURCES MANAGEMENT								
(Please rate using the following 0 = no capacity; 1 = little capacity, needs to be built; 2 = some gaps but is workable; 3 = capacity fully exist)	**Public Sector (Check (✓) the rating that best applies)**				**Private Sector (Check (✓) the rating that best applies)**			
	0	1	2	3	0	1	2	3
Policy Formulation								
Drafting of laws & regulation								
Preparation of WR Assessments								
Preparation of EAs								
Preparation of Socio-economic Assessments								
Monitoring of Water Quality								
Monitoring of Water Availability								
Monitoring of aquatic ecosystems								
Monitoring of Pollution loads								
Monitoring of Water Use								
Resource Use planning, protection and conservation								
Water Demand Management								
Water Allocation								
Conflict mediation								
Information generation, collection, analysis								
Laboratories for testing								
Measuring impacts								
International Negotiations								

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E. TECHNICAL ASSISTANCE FOR IWRM			
Are there any on-going technical assistance programmes/projects that relate to IWRM?			
Name of Programme	**IWRM Focus of the Programme**	**Financing (Amount and Source)**	**Duration**

F. TRAINING		
Are there any on-going Training Programmes that are related directly to IWRM?		
Name of Programme	**IWRM Focus of the Programme**	**Duration**
Secondary Level		
Technical		
Tertiary		
Post-Graduate		

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G. STAKEHOLDERS SCREENING

The following questions must be borne in mind when completing the Stakeholders' Matrix:

- Who are the main stakeholders that would need to be involved in development and implementation of an IWRM plan?
- What are the benefits of stakeholder involvement?
- What are the possible implications of *not* involving stakeholders?
- Which partners within government have the potential to become involved in the IWRM plan process?
- Who has a mandate that is directly related to issues that are likely to be addressed in the IWRM plan?
- Are there partners for whom the relationship is not immediately obvious? **For example**, officials from a Ministry of Finance may have no direct mandate relating to water resources management, but may make decisions that have profound implications for the success of an IWRM plan such as budget allocation and taxes.
- Who might be affected by the IWRM plan?
- What are their interests and positions?
- Who has information and expertise that might be helpful?
- Who has been/is involved in similar initiatives or planning?
- Who has expressed interest in being involved in similar initiatives/efforts before?
- Who else might be interested in preparing the IWRM plan?
- Are there stakeholders who might want to be fully involved, but for some reason can't be involved to the extent that they would like to be? What are those reasons?

You should classify the stakeholders according to the four groups below (1 – 4) and enter this in the Matrix under Category

5. Those who will likely want to participate fully or whose active involvement will determine the credibility of the process;
    - *Those that should serve on the coordinating committee*
    - *Those that should be involved in the planning and development processes*
    - *Those that should be involved in the implementation process*
    - *Those that should be involved in the monitoring and evaluation processes*
6. Those who would likely play a more limited role;
7. Those who would wish simply to be kept well informed;
4. Those who would not want to be involved

For each stakeholder, enter one of the following rating under Priority/Influence:
HH – High Priority/High Influence
HL – High Priority/Low Influence
LH – Low Priority/High Influence
LL – Low Priority/Low Influence

Stakeholder	Interests	Likely impact of the IWRM Plan	Priority – Influence (HH, HL, LH,	Category (1-4)	Capacities	Potentia in the IV Pla

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			LL)			

5 RESOURCE ANALYSIS

A. WATER RESOURCES				
Source – Present Situation				
Source	**Availability**	**Production**	**Consumption**	**Comment**
Source – Projected (15 years)				
Source	**Availability**	**Production**	**Consumption**	**Comment**

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Consumption – Present Situation					
Source	**Domestic**	**Industrial**	**Agriculture**	**Tourism**	**Environmental Services**
Consumption – Projected 15 years					
Source	**Domestic**	**Industrial**	**Agriculture**	**Tourism**	**Environmental Services**

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B. WATER OWNERSHIP			
	Yes	No	Comment
Water is a common good			
Water is the Property of the State			
Water is a private property			
Ownership can be variable			
Others			

C. WATERSHED/CATCHMENT										
Name of Watershed	Area	Shared?		Availability	Production	Main Activities in Watershed	Management Arrangement			
		Yes	No				Public	Private	CBO/ NGO	Co-Managed

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B. NATIONAL STATUS OF REGIONAL & INTERNATIONAL AGREEMENTS, CONVENTIONS, OBLIGATIONS AND INITIATIVES FOR IWRM										
Initiative	**Date Signed**	**Date Ratified**	**Plans for Implementation**		**Implementing Agency**	**IWRM Area of Focus (Both in the Initiatives and the Plan)**	**Harmonized within Legal Framework**			**Comments including progress towards implementation**
			Yes	**No**			**Yes**	**No**	**Partly**	

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