CARIBBEAN NATURAL RESOURCES INSTITUTE
(CANARI)

INCENTIVES FOR WATERSHED MANAGEMENT IN ST.LUCIA: RESULTS OF A BRIEF DIAGNOSTIC

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Incentives for Watershed Management in St. Lucia: Results of a Brief Diagnostic

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1. Summary and overview

St. Lucia is currently reforming its approach to water resource management in response to deficiencies that have plagued the sector for years and that limit the potential for development in other key sectors, including agriculture and tourism. This reform process has three related components:

- preparation of a national water policy based on the management of water as an economic product, and of a strategic plan for its implementation;
- development of a new legal framework and institutional arrangements for integrated management of the water sector;
- privatisation of the water industry, to attract new capital and reduce inefficiencies.

All these initiatives, which are receiving support from international agencies including the European Union and the World Bank, are in a fairly early stage.

While it is believed that the country's water supply, if properly managed, is adequate to meet current and projected demand, the information base on water resources is considered grossly insufficient for proper planning. The major issue faced by consumers has been *reliability*, since the supply comes almost entirely from surface water, mostly from rivers originating in the upper watershed. In the dryer parts of island and dry periods during the year, shortages chronically result in rationing. Decisions on allocation are made by the water distributor and generally favour critical sectors such as health and tourism, but even in these sectors, the lack of reliability and insufficient data on available quantity limit growth and development.

Water quality also is a serious problem, and one that resource managers largely link to upstream human activities, including siltation caused by conversion of steep forest land to agriculture, particularly banana production and grazing; associated agrochemical use; unregulated development along river banks; and the use of sub-standard septic systems, pit latrines, and rivers for bathing and washing.

The reform process now underway has revealed a consensus on the need for integrated management of the water cycle, with a range of tools, including land acquisition, regulation, education, community management, incentives, and markets, for addressing issues at each level. These tools, many of which are not currently in use and would therefore need to be developed and tested, would be specified in the strategic plan for the implementation of the policy.

This paper presents the findings of a brief study conducted under Phase 1 of a global initiative of the U.K. Department for International Development (DFID), *Developing markets for watershed protection services and improved livelihoods*, which is being implemented by the International Institute for Environment and Development (IIED) in collaboration with local partners. In the Caribbean, IIED's local partner is the Caribbean Natural Resources Institute (CANARI). The project is summarized in more detail in Appendix 1. The diagnostic consisted of a literature

review and interviews with a selection of key stakeholders between 13 and 16 August 2002 (see Appendices 2 and 3). This paper looks at watershed management in St. Lucia and identifies opportunities to develop market and incentive-based tools in order to improve management and increase local involvement. It also suggests opportunities for St. Lucia to contribute to and benefit from participation in a Caribbean learning group on incentives for watershed management, and through it in the larger global initiative of DFID and IIED.

2. Context

The water cycle

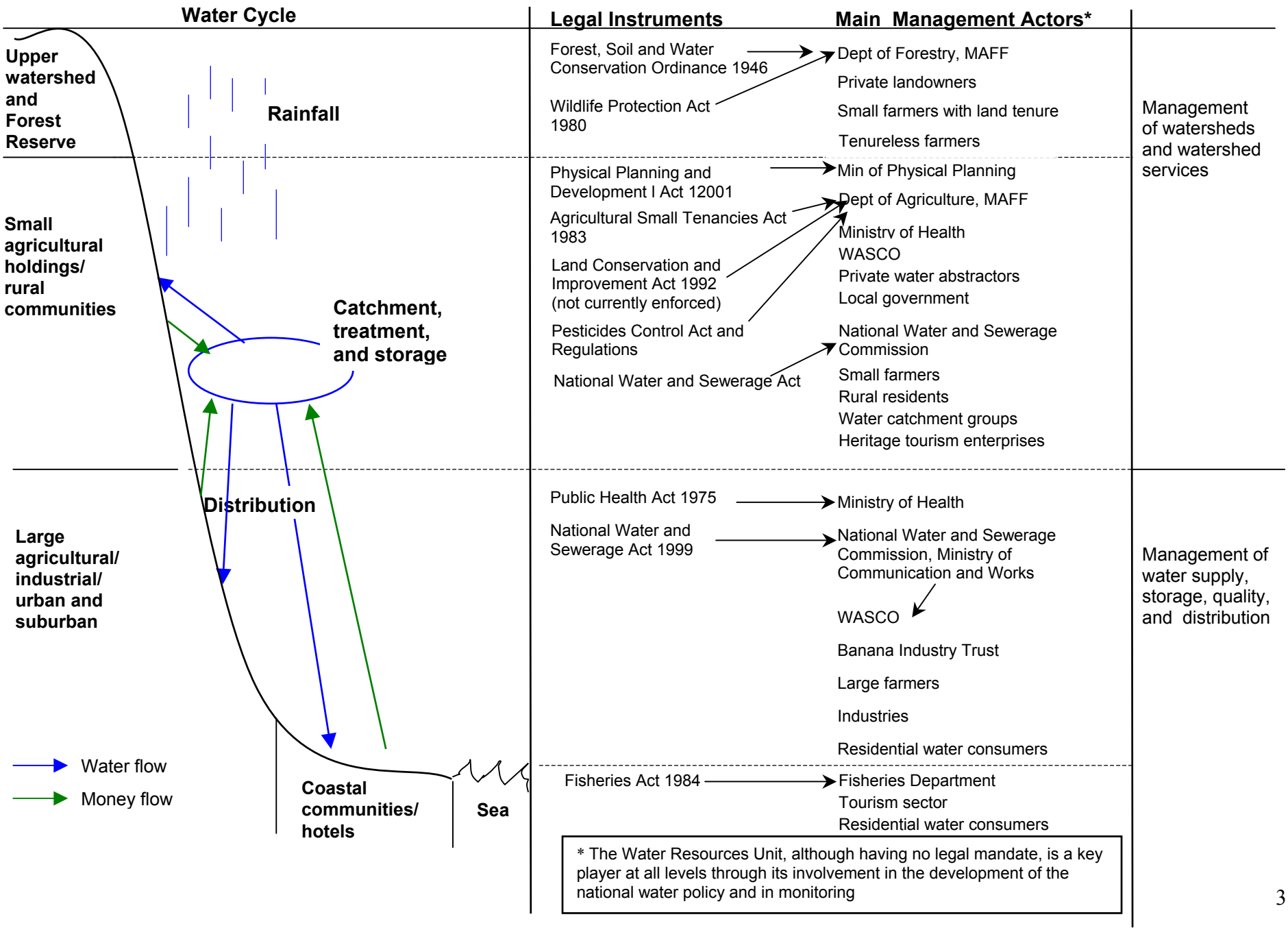
St. Lucia's water supply is entirely dependent on rainfall in the upper watershed, which is caught in the island's many rivers and the one reservoir recently built to serve the north of the island. Rainfall is highly variable across the island and throughout the year, with the June to November rainy season seeing as much as 75% of the annual total, and with the mountainous centre receiving more than twice as much rainfall as the dry southern coast. Much of the upper watershed is protected as Forest Reserve, but to assure adequate volume most abstraction occurs below the Reserves on private land, portions of which have been converted from forest to agriculture and other uses since the water intakes were installed decades ago.

Until recently, the Government of St. Lucia (GOSL) controlled and directly managed the water sector, and low rates and inadequate infrastructure resulted in considerable losses. The country is now in the process of converting to a private sector, market-based approach to the provision of water, under the regulation of the National Water and Sewerage Commission. Water is mainly abstracted by the private - but currently wholly government-owned - Water and Sewerage Company, Inc. (WASCO), which has the sole licence for the provision of piped water. Several watershed landowners abstract water from their property for bottling, but these operations are all on a fairly small scale and are not yet regulated by the Commission. The Commission recently issued a second licence for the abstraction of water for agricultural irrigation.

Information on the use of water by sector is incomplete, but it appears that at least half of the demand is for domestic and small-scale commercial use. The remainder is divided among the tourism sector, government, industry, and agriculture. Current use by the agricultural sector is low, but is expected to increase substantially with the expansion of irrigation to improve the efficiency of banana production.

While WASCO's government-operated predecessor, the Water and Sewerage Authority (WASA), chronically operated at a loss, WASCO has instituted rate increases and now appears able to cover its full cost of operations, including infrastructural improvements, along with a small surplus that goes towards the reduction of debt inherited from WASA. Income does not however cover the costs of water production and protection. The GOSL directly bears the costs of managing the Forest Reserves as well as enforcement and extension in the watershed and pre- and post-treatment water quality monitoring. In the case of one important watershed, a community group, the Talvan (or Talvern) Water Catchment Group (TWCG), conducts management activities in the area surrounding the local intake. These costs have been covered by the group members and through small grants from various agencies. The water cycle, its water and financial flows, legislative framework and main stakeholders are illustrated in Figure 1.

Figure 1: St. Lucia's Water Cycle, Associated Legal Instruments and Main Actors



The future of the water sector will be determined by the results of the policy and sectoral reform processes now underway, and the current structure of the industry could change significantly as a result of these processes. The draft water policy now being developed proposes that the rates charged for water should cover all costs of production, storage, treatment, and delivery, including those related to "protecting forests, watersheds and other ecosystems required to regulate and maintain water quality". In order to implement this policy recommendation, the economic value of these watershed management services would need to be established. The policy also suggests that the National Water and Sewerage Commission should have control over the allocation and use of all freshwater resources, even in areas within or surrounded by private land. This directive would have significant implications for the further development of the sector, including the water bottling business, which is now largely carried out by private landowners on their own lands without regulation. On the other hand, the draft policy does not address the issue of water abstraction or private production, through technologies such as desalinisation, for industrial uses, although their expansion could have significant implications for the development and privatisation of the sector.

The main stakeholders

The main stakeholders in the water cycle (see Figure 1) and their roles include:

Forest and upper watershed*:*

- *Department of Forestry*, Ministry of Agriculture, Forestry and Fisheries (MAFF): responsible for managing the Forest Reserves, protection of any other Crown Lands within water catchments, and education and extension on privately owned lands within water catchments.
- *Private landowners*: while most private land in the upper watershed remains in forest, some portions have been converted for agriculture and other uses that can impact negatively on water supply and quality. Since large-scale timber harvesting is not economically viable in St. Lucia, upper watershed landowners have an incentive to either sell their land or convert it to other uses.
- *Small farmers*: a small number of farmers use upper watershed private plots, or capture public lands, for short term planting or grazing, but soils and slopes are unfavourable.

Water catchments surrounding intakes and other middle watershed areas:

- *Ministry of Physical Planning*: responsible for development oversight, but lacks resources for monitoring and enforcement, particularly in rural areas. Many aspects of rural planning are actually addressed by the MAFF.
- *Department of Agriculture*, MAFF: responsible for agricultural extension and enforcement of legislation governing agricultural practices. The most powerful piece of legislation, however, the Land Conservation and Improvement Act of 1992, is not enforceable since the Board described in the Act has never been constituted.
- *WASCO*: abstracts from and maintains water intakes and reservoir and treats and delivers water. Does not conduct management activities in areas surrounding intakes; however its local officers do some limited extension work.

- *National Water and Sewerage Commission*, Ministry of Communication, Works, Transport and Public Utilities: established in 1999 to regulate the water industry and to coordinate the input of the various actors in the sector. It regulates water abstraction, treatment, and storage in catchment areas.
- *Water bottlers*: private landowners who abstract and bottle water from rivers on their land. Water quality is expected to meet set standards, but the industry is not currently regulated.
- *Ministry of Health:* responsible for conducting sanitary surveys of catchment areas surrounding intakes and bacterial analysis of pre-treated water, but constrained by limited resources.
- *Local government:* responsible for the management of community standpipes in rural areas. Some consider these standpipes to be a major source of leakage, as no individual or agency takes responsibility for their wise use.
- *Small farmers*: small farming in the middle watershed proliferated during the banana boom years. Many farmers are now converting to other crops or abandoning their plots, with some reversion to forest. Main impacts on the watershed are from agrochemicals and poor soil conservation techniques.
- *Rural residents*: lack of awareness and development control results in impacts on the watershed from rural communities, including solid waste disposal in rivers, leakage into rivers from pit latrines and defective or poorly sited septic systems, use of rivers for washing and bathing (especially during periods of water rationing), and grazing and tethering of domestic animals along riverbanks. Education has improved practices in a few communities.
- *Community water management groups*: community groups to help manage critical catchment areas were started by the Department of Forestry several years ago in five areas. Two groups remain active (Talvan and Thomazo) and have had an important impact on local awareness of the link between watershed management and water quality and supply. In the Choiseul area, farmers maintain an old canal in order to supplement the local water supply.
- *Heritage tourism enterprises*: several small enterprises supported by the St. Lucia Heritage Tourism Programme manage sites and attractions in the watershed and depend on good water quality and a pristine natural environment.

Lower watershed, urban, industrial and coastal areas:

- *National Water and Sewerage Commission*: responsible for licensing water companies, and is overseeing the development of the national water policy.
- *WASCO*: the first company licensed under the National Water and Sewerage Act 1999 "for the provision of an adequate water service... for the people of St. Lucia". The vast majority of households have access to piped water, although many rural households still rely on community standpipes or extract water directly from rivers.
- *Ministry of Health*: responsible for conducting post treatment bacterial analysis and certifying piped water as safe for drinking.

- *Banana Industry Trust*: an entity established in 1999 to support the development of the banana industry through the management and disbursement of grants from the EU, it has a licence to abstract water for irrigation, but has been impeded by inadequate supplies.
- *Large farmers*: lowland plantation farmers abstract water directly from rivers and use irrigation on a limited but increasing scale.
- *Industries, tourism sector, households*: the major consumers of water, are encouraged to conserve and for many, particularly industrial users, recent increases in water rates have provided a strong incentive to do so.

There are currently no mechanisms that bring all or even a portion of these many stakeholders together. However, the *Water Resources Management Unit (WRMU)*, MAFF, which was established through the European Union-funded Water Resources Management Project, provides a national focal point for water issues and works regularly with all the main institutional actors.

The financial and technical assistance agencies that are heavily involved in various aspects of water sector reform also have major stakes in the process. These include the *World Bank,* which is supporting the process of water sector reform*,* and *European Union,* which is supporting the development and improved management of water resources for the agricultural sector through its STABEX programme. And two national programmes, the *Basic Needs Trust Fund* and the *Poverty Reduction Fund* are financing a major initiative to supply water connections to poor communities, resulting in a substantial increase over the past ten years in the number of rural homes with piped water.

3. Threats to watersheds and management responses

The activities that threaten watershed services are well understood by the country's resource managers, if not the general population. The following table identifies the major management issues, past and current responses and constraints, and solutions that have been proposed or were suggested during the interviews for this report.

Threats	Existing responses and constraints	Proposed solutions
Portions of forested upper watershed are privately owned and vulnerable to change of use. Some of this land, as well as small amounts of captured private land, is being used for marginal farming, with negative impacts on water retention and quality.	Government has purchased some pieces of watershed that are most critical for water production or storage. *But* land purchase is costly, slow, and can require relocation of residents; and MAFF's resources for extension work with local farmers are limited.	• Place surcharge on water rates to finance purchase of critical upper watershed areas and incorporate into Forest Reserve. • Conduct land swaps between GOSL and private landowners to rationalize area in Forest Reserve for increased contribution to water supply. (A few swaps over the past 20 years provide a precedent.) • Provide incentives to private landowners to grow tree crops that will support improved water retention and quality. • Provide upper watershed landowners with licences to abstract and sell water in exchange for good land use practices. • Make water production the primary objective of forest reserve management, through the planting of species that optimise water retention.

Threats	Existing responses and constraints	Proposed solutions
Much of area around water intakes is privately owned and subject to contaminating activities, e.g., pesticide use, inappropriate waste disposal, poorly sited or constructed septic systems and pit latrines; use of rivers for washing and bathing. Water abstracted therefore requires heavy treatment. And development of heritage tourism sites and attractions is hampered by poor water quality (e.g., at waterfall attractions) and vulnerability to natural disasters.	• The Dept of Forestry has worked with community groups in critical water catchment areas to encourage local stewardship and two groups remain active. One group has done river stabilization activities upstream from intake and seeks to increase local awareness of the impacts of human activities on water quality and quantity. The other group is advocating the relocation of the intake to a less heavily impacted area and is also interested in conducting watershed rehabilitation activities. *But* these groups have no steady financial support for their work and rely on small grants and ongoing assistance from Forestry. • Consumers generally distrust quality of piped water. The middle class is increasingly purchasing bottled water; others boil their water before drinking. • WASCO and the Ministry of Health undertake water quality monitoring, and the WRMU is initiating a water quality monitoring programme for selected areas	• Purchase areas draining into water intakes and incorporate into Forest Reserve • Relocate intakes from areas of intense human activity to more pristine areas (but would result in a decrease in available water for abstraction) • Establish arrangements between GOSL or water company and communities surrounding intakes to manage areas for improved water quality and quantity, with provision for local monitoring • Decentralise water services to permit the establishment of local operators and the introduction of competition to stimulate improved quality and service • Provide incentives for marginal banana and livestock farmers to convert to tree crops and other land uses that are compatible with clean water production • Strengthen regulations related to water quality and the capacity for water quality monitoring, including chemical monitoring.

Threats	Existing responses and constraints	Proposed solutions
C Much of middle watershed is used for banana or short crop production that contributes to soil erosion and contamination from agrochemicals. However, this threat may be diminishing with the rapid decline in the external market for bananas. C Activities and practices of households in watershed result in pollution, erosion and other forms of watershed degradation.	C Some agencies and community groups carry out sensitisation and extension activities in rural communities. *But* their human capacity is limited and they are unable to regulate or enforce, and there is still little awareness of the impacts of activities in the watershed on water quality and supply. C A national land policy is being developed that if implemented should address the need for integrated watershed management.	• Conduct education campaigns, targeted particularly at schools and rural communities, on the importance of watershed protection • Provide incentives to farmers and landowners based on meeting land use standards • Operationalise and enforce the Land Conservation and Improvement Act 1992 • Establish the hydrological boundaries of the country's watersheds and implement watershed-based management systems that allow for extension and regulation based on individual watershed characteristics and requirements, for participatory planning at watershed level, and for transactions between stakeholders to mitigate downstream impacts • Encourage downstream hotels and tourism attractions to support watershed communities to improve land use

Threats	Existing responses and constraints	Proposed solutions
Levels of water consumption and loss in the catchment and distribution system exceed available supply in many areas, especially in the dry season, resulting in frequent rationing, particularly in rural communities and the dry south of the island.	• WASCO rate structure rewards conservation by domestic users. *But* water rates do not cover the full cost of production, storage, treatment, and delivery, and Government assumes most of the costs of water production (watershed protection and management). • Those who can afford install back-up tanks and occasionally water-saving devices and cisterns. *But* others use rivers for bathing, washing and drawing water when piped water is not available, resulting in further contamination. • WASCO has conducted some public awareness activities on the subject of conservation. *But* there is still insufficient awareness of the value of water and the need to conserve it. • Farmers in the Choiseul area work together to maintain sugar-era canal to bring additional water to the area for farming and other uses.	• Incorporate the costs of watershed management, now borne by government agencies (e.g., Dept of Forestry) and others (e.g.,TWCG) into water rates • Conduct education campaigns on the cost and value of water to increase consumer acceptance of higher rates and improve water conservation responsibility at the household level • Develop a water pricing structure that better rewards conservation and eliminates cross-subsidies (except for the poor) • Reduce loss in the system through infrastructural improvements and systems for monitoring wastage levels. • Provide incentives for residential and business consumers to retrofit fixtures and install water cisterns, tanks, and roof harvesting systems to reduce piped water consumption • Provide tax incentives to hotels to assist communities to install water saving devices and storage facilities • Establish local water user associations to assist in managing and conserving water resources and in community education
Existing available water resources may be inadequate to meet national development goals (e.g., economic development of south of island, expansion of irrigated banana farming).	A national policy for integrated water resource management is being prepared, to be followed by the development of institutional arrangements to address the existing lack of interagency coordination and a work plan for policy implementation.	Conduct a comprehensive national water resources inventory and use as basis for a national water resources development and use plan

The policy and institutional environment

Awareness of the need for improved watershed and water resource management began relatively early in St. Lucia, and has existed within key government agencies since at least the 1980s, resulting in the Forestry Department's focus on management of water catchments and plans for the development of the Roseau Dam. Prior to the reform process now underway, however, virtually the only functional links between watershed management and the provision of water came from the establishment of Forest Reserves in the upper watersheds during the colonial era, the promulgation of the Forest, Soil and Water Conservation Ordinance of 1946, amended in 1983, and the work of the Department of Forestry. In recent years, the Department has sought, with some success, to increase the involvement of rural communities in the management of local water catchment areas.

The Water Resources Management Unit was established in the MAFF in 2000 through the EU-funded Water Resources Management Project, initially out of a need to assess water availability for irrigation to improve banana production efficiency. The Unit, whose small staff is housed at the Department of Forestry's offices, is coordinating the development of the national policy and the strategic plan and institutional arrangements (including mechanisms for coordination of the main actors) that will result from it. Other programme areas include prioritising watersheds for rehabilitation, increasing public awareness through education and the establishment of water user groups, and improvement in the monitoring of water resources.

As seen in Figure 1, the legislation related to watershed and water resource management appears somewhat piecemeal, but actually provides a comprehensive framework that, once marshalled in a coordinated manner through an integrated water policy, should provide adequate regulation and protection. The one weak link in the framework may be the Water and Sewerage Act of 1999, which has been revealed to have a number of deficiencies, and is likely to require a comprehensive review and revision in the near future. The national water policy is being developed with sectoral input, largely through the use of focus groups representing a range of interests. The draft policy, which has not yet been finalised for submission to Cabinet, addresses water issues largely from the user end of the water cycle and is perceived by some as giving insufficient attention to the production end, including watershed protection and management. The section of the policy on "water for environmental sustainability" does encompass issues related to watershed management, but from the perspective of the environment as a user of water rather than a producer.

The Water and Sewerage Act established the National Water and Sewerage Commission to regulate the industry and manage the country's water resources. To date, the Commission, whose terms of reference are still evolving, has concentrated on its licensing and regulatory functions. It is possible that its dual roles will eventually be split between two bodies, one responsible for regulation and the other for coordination and management. The World Bank project on water sector reform, which is focused only on the commercial and operational aspects of the water cycle, is putting in place the legal and institutional framework for privatization of the water sector. The GOSL is privatizing the industry in order to attract capital for major infrastructural improvements needed to improve service and permit further development, particularly in the south of the island, and the expansion of irrigated agriculture.

4. Progress and opportunities

St. Lucia faces serious challenges in the management of its water resources, but is moving forward to address them in innovative ways and has recognized the potential of market-based approaches to improve management effectiveness and efficiency. It has made good use of assistance from international agencies including the World Bank, the OAS, and the EU, and regional organizations, particularly the Caribbean Environmental Health Institute (CEHI) and the OECS Natural Resources Management Unit. It is participating in the GEF-funded project *Integrating watershed and coastal area management in small island developing states of the Caribbean*, which is coordinated by CEHI and the United Nations Environment Programme. While there is much work still to be done to sensitise people to the link between activities in the watershed and the quality and reliability of water, the projects supported by these agencies have had a positive impact on public awareness.

The national water policy is being developed in tandem with a national land policy, with the involvement of many of the same actors, providing opportunities for the development of more integrated and holistic approaches to managing the water cycle.

Incentives have not been a major tool in watershed management in the past. Poor water quality and reliability have actually served as incentives for both water conservation and community action, but as quality and reliability improve, other incentives will be required to sustain desired behaviours. In addition, there are precedents for the use of fiscal incentives; for example an incentive programme already exists for the purchase of solar water heaters, which could potentially be expanded to include water conservation devices and roof catchment systems with associated cisterns. These incentives would largely be of interest to higher income groups, however.

The work of the TWCG is well known and widely praised, and other communities have indicated interest in similar approaches. The Group has succeeded in obtaining support through small grants from national and regional sources and in doing so has developed a good understanding of the costs of its management interventions. There are unfortunately no data to substantiate empirical evidence that water quality and quantity have improved as a result of the Group's interventions, but the Group is anxious to put a water quality monitoring programme in place.

The MAFF has developed a GIS-based land use planning system, which pulls together the results of past land use and capability studies and incorporates spatial decision support tools for determining optimal land management regimes. The system is meant for use at the watershed level, and the Ministry plans to use it as the basis for the development of management plans for critical watersheds. The availability of this information base on GIS and associated decision tools opens up possibilities for new and interesting approaches to participatory land use planning.

Through the St. Lucia Heritage Tourism Programme, the GOSL is seeking to diversify its tourism product and spread the benefits through support to largely rural-based heritage tourism sites and attractions. Among the issues being addressed is that of "wise water management" by the small enterprises managing heritage tourism sites, but the need to protect these sites, which include waterfalls where visitors bathe, from upstream impacts on water quality is now also being given attention.

5. Needs and directions

Most of the requirements for improving the management of the water cycle have been identified through the current policy process. Those that are particularly relevant for the development of incentive and market-based approaches to watershed management include the following:

- *Development of a comprehensive data base on water resources* to determine water supply, availability, rates of production and loss, geographic and temporal variations, and the uses that can be sustained
- *Quantification of the value of the watershed management services* currently and potentially performed by government agencies, land owners, and community groups, so that these can be used in economic planning and built into future tariff structures
- *Systems for monitoring water quality and supply*, in order to evaluate the impact of management interventions in the upper watershed and around water intakes
- *Mechanisms to bring watershed stakeholders together* to find solutions to problems and to permit direct transactions between upstream and downstream stakeholders, thus spreading the cost of watershed services among all beneficiaries, not only piped water consumers
- *Improvement of management responsibility at all levels of the water cycle* from upper watershed farmers to downstream consumers, through targeted programmes of education and extension.

6. Possibilities to explore

St. Lucia can learn from the positive and negative experiences of other countries in moving to a market-based approach to water production and delivery. Two clear lessons from these experiences relate to the need to incorporate provisions for upper and middle watershed protection into the cost structure of the industry, and the need to ensure that the poor are not hurt by, but are able to benefit from, the changes in the sector. Incentive and other fiscal-based approaches are relevant in addressing these needs. Based on the discussions held for this diagnostic, the following areas may be worth further exploration.

Actions to sustain and expand the work of local water catchment groups

The decentralized nature of St. Lucia's system of water abstraction, treatment and distribution creates the possibility of local water management and thus provides the incentive for the establishment of water catchment groups around intakes. But the work of protecting intakes is costly and time-consuming, and sustainable sources of support are required. A pilot market-based approach to the provision of intake protection services could be developed and tested in Talvan and if effective, extended to other areas. Activities would need to include:

- an economic valuation of the benefits, in terms of improved water quality and quantity, of the activities being carried out by the TWCG
- an assessment of their costs, in terms of labour, materials, transportation, and technical assistance
- an assessment of the technologies and approaches being used and how they might be improved
- negotiations, between the TWCG and WASCO, the GOSL, or another interested party, on the price to be paid for the services provided

- implementation of a system to monitor the effectiveness of management.

A watershed stakeholders' forum to stimulate transactions between upstream and downstream users

The MAFF is interested in using its new GIS rural land use planning tools to develop watershed-based management systems, including management plans for critical watersheds. The Ministry also has a long-standing history of support to community-based management approaches. Using the watershed management planning process as an opportunity to bring stakeholders together in a watershed forum could provide the potential for negotiations between stakeholders on upstream uses that have downstream impacts and even for direct transactions between upstream and downstream users. Past interest by a major coastal hotel in supporting upstream watershed management activities in order to reduce sedimentation of its coastal waters demonstrates that there could be interest in such transactions. The ideal watershed for testing such an approach would be one that supports a range of uses resulting in costly upstream-downstream impacts. The Choc watershed has been already been proposed for a pilot integrated watershed management project through the GEF-funded integrated watershed and coastal area management project. The Marquis watershed, which includes the Talvan water intake and at least one heritage tourism site, would also be a suitable candidate.

Incentives for watershed landowners to convert to watershed-friendly cropping systems and other uses

The decline of bananas opens up the potential for introducing more "watershed friendly" crops and other uses, including nature-based tourism, which could be promoted as part of a strategy of integrated watershed management. Small farmers in the watershed are currently accepting decreasing returns from bananas or abandoning their land and moving out of agriculture because they lack the information and financial resources to convert to other uses. Many are reluctant to switch to tree crops because of the long time lag between planting and harvesting the first crop. A pilot incentives programme could be developed to encourage small landowners to convert to cropping systems that support watershed services and are financially attractive over the long term. The programme could include education and technical assistance components as well as support for diversification to appropriate non-agricultural uses.

Development of a coordinated private sector response to water management needs

Some St. Lucian industries, notably the hotel and beverage industries, have high rates of water consumption and thus a major interest in maintaining supplies and keeping costs down. Engaging them in a process to identify ways in which they could improve efficiency of water use and support improved upstream management of water resources to protect supplies and reduce costs could result in new and innovative approaches while contributing to a greater sense of stewardship on the part of an important community of stakeholders.

7. Conclusion

Other countries of the region would have much to learn from St. Lucia's development and implementation of an integrated water management policy coupled with the move to privatise the water industry. In turn, the process underway in St. Lucia could benefit from information on progress in other countries of the region, for example Jamaica's system of watershed classification and mechanisms for inter-agency collaboration on watershed management. St. Lucia would therefore be a valuable participant in a regional learning group as part of Phase 2 of the IIED/DFID programme *Developing markets for watershed protection services and improved*

livelihoods. In addition, there appear to be opportunities for St. Lucia to explore the use of incentives and markets to improve watershed services through pilot projects potentially supported through this programme. CANARI will be developing proposals for a Phase 2 Caribbean programme over the coming weeks, and would welcome indications of interest and suggestions regarding St. Lucia's involvement.

Appendix 1

Markets for watershed protection services and improved livelihoods

Summary of an IIED project supported by DFID

Phase I: Exploration of the potentials

A central plank in strategies to reduce poverty is to improve access to reliable supplies of clean water. Another is to reduce vulnerability to environmental risks such as flooding, landslides and water pollution. Both of these require better management of watersheds. Today, services provided by watersheds are often under threat, and existing regulatory approaches to addressing the problems are often insufficient. Yet participatory and market-based approaches are also emerging throughout the world.

IIED, with its partners in developing countries, have identified the need to integrate and promote all approaches which can improve watershed land use and livelihoods – fitting new market-based approaches together with existing policies, incentives and institutional mechanisms that work. DFID shares these concerns and has commissioned IIED to explore how to do this. CANARI and SEDU-UWI have been identified as regional partners to help in this exploration in the Caribbean.

A four-year programme of research and action in a range of countries is therefore proposed to increase understanding on how market-based approaches can support better watershed land use and improved water services for the benefit of poor people – and where they cannot. The programme will include international network building, experience sharing, and an action-learning component involving people in regions that can gain from working together. Four action-learning regions are proposed – South Africa, India, Indonesia and the Caribbean – to be coordinated by regional partners, with back-up from IIED. Substantive Phase 2 work in the action-learning regions will depend on the support of the relevant DFID country/regional programmes, or other development assistance agencies.

The aims of Phase 1 are:

- To explore the relevance of the project in the Caribbean, building on preliminary IIED exploration in January 2001, which identified interest in Grenada, Jamaica, St Lucia and Trinidad;
- To conduct brief national diagnostics in four Caribbean countries to assess the links between suppliers and users of watershed services, to map out related initiatives, and to identify learning needs and opportunities
- To explore what a regional project might do, to develop and share learning on the potentials and limits of market-based approaches
- To identify key partners and resource people for moving forward

Appendix 2

Persons met with, August 13-16, 2002:

Lucien Augustin, Babonneau area field officer, WASCO

Deborah Bushell, Project Manager, Water Resources Management Unit, MAFF

Sylvester Clauzel, Programme Coordinator, St. Lucia Heritage Tourism Programme

Christopher Cox, Chief Agricultural Planning Officer, MAFF

Crispin d'Auvergne, Sustainable Development and Environment Unit, Ministry of Planning

Hon. Felix Finisterre, Minister of Communications, Works, Transport and Public Utilities

Herold Gopaul, Director, Information Services, and Shanta King, Sanitary Engineer, Caribbean Environmental Health Institute

Cornelius Isaac, Assistant Chief Forest Officer, Department of Forestry, MAFF

Joseph Medard, Chief Environmental Health Officer, Ministry of Health

Martin Satney, General Manager, WASCO

Talvan Water Catchment Group: Claudina Roberts, Secretary, and other members

Major documents consulted:

Bushell, D. 2002. Water resources management: a national concern. Insight 1:18-19.

Cox, C. n.d. Perspective on rural land management and soil and water conservation in St. Lucia. http://www.slumaffe.org/rural_land_management.pdf.

Government of St. Lucia. 2000. National report on integrating the management of watersheds and coastal areas in St. Lucia. Prepared for the Caribbean Environmental Health Institute and the United Nations Environment Programme. 105 pp.

National Water and Sewerage Commission. 2001. Licence granted by the National Water and Sewerage Commission under the Water and Sewerage Act No. 13 of 1999 to Water and Sewerage Company Incorporated. Draft of 9 July 2001.

Organization of Eastern Caribbean States Natural Resources Management Unit. 2002. Proceedings of the Regional Policy Dialogue on Watershed Management in Small Island States. Eastern Caribbean Central Bank, Bird Rock, St. Kitts & Nevis, 25-27 February 2002. 35 pp.

Talvan Watercatchment Group. 2002. Talvan rapid riverbank rehabilitation and soil conservation project. Proposal to the Water and Sewerage Company (WASCO). 5 pp.

Water Resources Management Unit. 2002. National water policy of St. Lucia. Draft. 41 pp.

Appendix 3
Questions guiding the brief diagnostic for St. Lucia

1. What are the big watershed issues?

- Reliability of water supply?
- Water quality?
- Landslip, erosion, etc?
- What services are scarce?
- What are the 'priority' watersheds and how determined?

2. Where has watershed management (WM) improved?

- What improvement (re scarcity)?
- How, by whom, through what kind of activity?
- [Any particular project, programme, incentive responsible?]

3. Is there good information correlating land use to watershed services?

- Generally, and in specific places?
- Who generates it and how?
- What form does it take?
- Any watershed valuation work?
- [Any particular project, programme, incentive responsible?]

4. What groups have been targeted to improve WM? [see *Figure A* below]

- Who are the producers of watershed services (small farmers in uplands, forestry)?
- What are their motivations in relation to WM?
- Who are the users of watershed services (irrigated plantation agriculture, tourism, industry, government services, domestic)?
- What are their motivations in relation to WM?
- What key behaviour changes are required for each (encouraging good practice, stopping bad practice…)? And who has decided this?
- Who has been actively targeted – as a group, or within a geographical area?
- [Any particular project, programme, incentive doing such targeting?]

5. What incentives have been proposed or used to improve WM?

- Who has been pushing incentives approaches and why?
- Type of incentive used in practice? (intangible, physical, information, training, rights, financial, market-based)
- Who targeted (supply-side, demand-side)?
- Period/regularity?
- Awareness of incentive by target group and take-up levels?
- Constraints to take-up e.g. rights, resources?
- Compatibility with other sustainable development objectives and participatory approaches?

6. What impacts have incentives had?

- On changed WM practices?
- On the quantity and quality of watershed services?
- On other environmental variables e.g. biodiversity?
- On economic objectives (sector/livelihood)?
- On social objectives e.g. equity?
- Distribution of costs, benefits and risks?
- How is information on impacts being generated?

7. What are the relations between producers and users of watershed services? [see *Figure B* below]

- Where there is competition or conflict between users, how is water allocation determined?
- Is there competition between suppliers – in what form?
- What means of communication/intermediaries link stakeholders?
- Local institutions to bring stakeholders together – role and effect? Links to other local institutions?
- National institutions to bring stakeholders together – role and effect? Links to other national institutions?

8. How can learning/capacity for incentives for WM be improved?

- What kind of learning does St. Lucia already offer?
- What kinds of capacity are in place to handle incentives?
- What further learning needs are there – from the Caribbean, globally?

Figure A: The 'water cycle', stakeholders, incentives and finance flows.

- *Sketch the water cycle from water interception to 'final use'.*
- *Place major producers/users of watershed services within*
- *Note the service provided by producer, and scarcities faced by user*
- *Note their motivations in relation to watershed management*
- *Note incentives that match motivations (and perverse incentives against motivations)*
- *Show finance flows between stakeholders*

Figure B: Institutional relations regarding WM.

- *Sketch Venn/flow diagram showing formal and informal institutional roles, relationships, and information flows regarding WM*