

Developing markets  
for watershed  
services and  
improved livelihoods



# Fair deals for watershed services in the Caribbean

Sarah McIntosh  
Nicole Leotaud



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First published by the International Institute for Environment and Development (UK) in 2007  
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ISBN: 978-1-84369-652-0      ISSN: 1605-1017

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A catalogue record for this book is available from the British Library

Citation: McIntosh and Leotaud. 2007. *Fair deals for watershed services in the Caribbean*.  
Natural Resource Issues No. 8. International Institute for Environment and Development. London, UK.

Design by: Eileen Higgins, email: [eileen@eh-design.co.uk](mailto:eileen@eh-design.co.uk)  
Printed by: Russell Press, UK on 80% recycled paper

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## Acronyms and abbreviations

ALG	Action Learning Group
CANARI	Caribbean Natural Resources Institute
CARICOM	Caribbean Community
CEHI	Caribbean Environmental Health Institute
CIDA	Canadian International Development Agency
FAO	Food and Agriculture Organization of the United Nations
FACRP	Fondes Amandes Community Reforestation Project
GEF	Global Environment Facility
IIED	International Institute for Environment and Development
IFMDP	Integrated Forest Management and Development Programme (Saint Vincent and the Grenadines)
IWCAM	Integrating Watershed and Coastal Areas Management project
LFMC	Local Forest Management Committee (Jamaica)
LFUG	Local Forest User Group (Saint Vincent and the Grenadines)
MES	Markets for Environmental Services
MWS	Markets for Watershed Services
NIWMC	National Integrated Watershed Management Council
NRWRP	National Reforestation and Watershed Rehabilitation Project (Trinidad and Tobago)
PES	Payments for Environmental Services
PWS	Payments for Watershed Services
SEDU	Sustainable Economic Development Department, UWI Saint Augustine
SIDS	Small island developing states
TWCG	Talvern Water Catchment Group
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
UWI	University of the West Indies
WASA	Water and Sewerage Authority, Trinidad and Tobago
WASCo	Water and Sewerage Company, Saint Lucia
WMU	Watershed Management Unit
WPFW	Who Pays for Water (project title)

## Acknowledgements

CANARI acknowledges the contributions of the many stakeholders who participated in the consultations and discussions at the national and sub-national project sites, who are too numerous to acknowledge individually. Particular thanks are due to the Forestry Departments in all the project countries, which gave freely of their time and expertise and coordinated many of the local activities.

The project would not have been possible without the expertise and commitment of Dennis Pantin and Justin Ram of the University of the West Indies Sustainable Economic Development Unit, Saint Augustine, Trinidad, who undertook the valuation research in Jamaica and Saint Lucia, designed and delivered a training workshop on the valuation of watershed goods and services, and crystallised their work into some accessible guidelines for the Caribbean.

Special thanks are also due to all the members of the Action Learning Group (ALG) who contributed valuable insights from their particular sectors and perspectives. Several ALG members also acted as consultants to the project: Cletus Springer, Sylvester Clauzel and Christopher Cox. Thanks are also due to the other consultants who contributed outputs: Thera Edwards, Matthew Harvey, Carolyn Hayle, Sharon Wright (all Jamaica), Allan Smith and Luvette Thomas-Louisy (both Saint Lucia).

The project benefited greatly from its study tour to Costa Rica; we are grateful to local coordinators Miriam Miranda and Luis Gamez for the excellent arrangements and facilitation, and to all the Costa Rican payments for environmental services (PES) stakeholders who gave so freely of their time in panel discussions and field visits.

CANARI also acknowledges the sustained support of its partners at IIED, and particularly Duncan Macqueen, whose participation in the ALG meetings facilitated the incorporation into the Caribbean project of lessons learned at the global level. Former CANARI colleagues Gillian Cooper, Lyndon John and Vijay Krishnarayan all contributed significantly to the design and implementation of the project in its earlier stages, and Alana Lum Lock coordinated the analysis of the Fondes Amandes case study. Finally, special mention must be made of CANARI associate Tighe Geoghegan, who played an integral role in the conceptualisation of the project and has continued to provide support to the current project team in the analysis and documentation of the project's findings.



Buff Bay/Pencar stakeholder meeting



Land use and hydrology training workshop

## Executive summary

This report describes a two-and-half year action-learning project that strengthened the capacity of regional and national institutions to assess the potential of economic instruments to improve the quality and delivery of watershed services and local livelihoods in the Caribbean. It focused on project sites and case studies in five Caribbean countries (Jamaica, Saint Lucia, Grenada, Trinidad and Tobago, and Saint Vincent and the Grenadines) while seeking to draw lessons of wider regional interest.

The project, entitled *Who Pays for Water? Preparing for the use of market-based mechanisms to improve the contribution of watershed services to livelihoods in the Caribbean*, was implemented by the Caribbean Natural Resources Institute (CANARI). *Who Pays for Water?* was the Caribbean component of an international project *Developing Markets for Watershed Protection Services and Improved Livelihoods*. The international project was coordinated by the International Institute for Environment and Development (IIED) with financial support from the United Kingdom Department for International Development (DFID). The international project included activities in India, Indonesia, South Africa, China and Bolivia in addition to the Caribbean.

The Caribbean project focused throughout both on the process of action learning and on the findings of the various activities. It was steered by a regional multi-stakeholder Action Learning Group (ALG) to support the development of a shared understanding across the region of watershed approaches that work to improve the environment and the livelihoods of poor and vulnerable groups. The objective was to build a community of change agents prepared to adapt and shape new watershed market initiatives and disseminate learning from the project.

The mood at the start of the project was one of concern, curiosity and caution. Policy makers and watershed managers throughout the region were growing increasingly concerned about the continuing trend of watershed degradation and the limited success of the approaches that had been used to reverse this. Their curiosity was piqued by the growing international emphasis on payments for watershed services (PWS), although understanding of what this meant in practice was limited because none existed in the region at the time. However, this curiosity was tempered with caution, even scepticism, about market-based solutions at a time when the withdrawal of preferential tariffs for bananas was having a devastating impact on rural livelihoods and national economies.



As the project evolved, consensus was reached on a working definition of PWS, namely that they are (Wunder 2005):

1. a voluntary transaction;
2. focused on a well-defined environmental service (or a land use likely to secure that service);
3. 'bought' by at least one buyer;
4. from a minimum of one environmental service provider;
5. if – and only if – the environmental service provider secures conditionality.

The selection of project sites and activities was underpinned by two key subsidiary objectives: to sustain existing community-based watershed management activities; and to examine how to enhance the contribution of the economic sectors that are the major beneficiaries of watershed services. The main project components were:

- **Jamaica Action Learning Project**, which examined the potential and mechanisms for PWS in the Buff Bay/Pencar watershed, with a particular focus on sustaining the critical but underfunded activities of the Local Forest Management Committees (LFMCs). A unique feature of the LFMCs (at least within the Caribbean) is that their geographic mandate is designed to coincide with watershed boundaries. The main components were: an economic valuation study (Pantin and Reid 2005); a survey of incentive regimes in the Buff Bay/Pencar watershed (CANARI 2006c); and the establishment of a national ALG which met formally or informally throughout the project.
- **Saint Lucia Action Learning Project** (CANARI 2006d), which examined the impacts of the activities of the Talvern Water Catchment Group (TWCG) on watershed services and livelihoods as well as the potential and mechanisms for PWS. The main components of this project were: a hydrological assessment and watershed management plan for the Talvan water catchment (Cox 2004); a valuation study of the contribution to the watershed services of the TWCG (Pantin *et al.* 2006); and the establishment of a national ALG which met on four occasions.
- **Case studies** of two examples of community involvement in watershed management: the Fondes Amandes Community Reforestation Project (FACRP) in Trinidad (Lum Lock and Geoghegan 2006); and the Integrated Forest Management and Development Programme (IFMDP) in Saint Vincent (John 2006; CANARI 2005a).
- **Research on strengthening links with key economic sectors**, by sector studies of tourism (CANARI 2004c; Leotaud 2006), water (Springer 2005a – c; CANARI 2006f) and agriculture (Thomas-Louis and Edwards 2006; CANARI 2006c,g), and stakeholder forums to consider the findings.
- **Dissemination of learning** through the ALG meetings, sector forums, training programmes, a variety of publications and a dedicated website (<http://www.canari.org/alg.htm>).

The project identified several key constraints to the implementation of PWS in Caribbean small island developing states (SIDs):

- a fragmented policy and institutional framework in which independently developed and often conflicting laws and incentives from different sectors militate against an integrated approach to watershed management;
- informal land occupancy and/or lack of tenure security for key groups within the upper watershed, which complicates any formal contractual arrangements;
- a policy environment anchored more in concepts of social justice than market efficiency;
- subsidised water pricing, particularly for certain economic sectors such as agriculture, and a resistance from both politicians and consumers to full cost pricing;
- scarcity of willing downstream buyers on a scale that matched the extent of upstream remedial action required;
- as in other small countries with small and micro-watersheds, high transaction costs relative to the small scale of the watersheds and the value of the services secured;
- data gaps and, in many cases, insufficient human capacity within national institutions to identify critical problems for watershed services; design desirable land-use interventions and quantify their hydrological impacts; and conduct economic analyses to determine the potential of payment schemes to address the problems.

These constraints hindered the introduction and testing of payment schemes at any of the testing sites. However, the analyses contributed significantly to an improved regional understanding of the prerequisites for selecting PWS sites with prospects of success for both the services and livelihoods. They also provided a greater understanding of the alternatives, including pointers as to what constitutes effective incentive and community-based watershed management regimes that can contribute to the enhancement of watershed services and livelihoods. In the long term, this is likely to prove as useful to policy makers as pilot tests of PWS that might not have been replicable in other islands or on a larger scale.

Key lessons learned include the following:

- PWS cannot substitute for effective land-use planning or poverty-reduction strategies, particularly in restricted geographical areas. In many Caribbean SIDS, there is no comprehensive or up-to-date land-use plan, and legislation is often conflicting, unenforced or both. Development for housing or tourism is a major contributor to watershed degradation, yet incentive schemes designed to secure watershed services are targeted mainly at small-scale farmers. The potential of these schemes to benefit the poor is also limited by the fact that most require proof of ownership or legal tenure.

- An effective integrated institutional structure for watershed management must have a legal basis for power, clear authority and the ability to devolve power and authority to well-funded and technically competent local watershed institutions. An effective institutional process must assure the flow of information up and down.
- The tools and methods that underpin PWS, such as the valuation of watershed services, hydrological assessments, the design of appropriate land-use interventions and participatory resource mapping, can be useful in the broader context of determining what is the most effective approach to watershed management in a specific context.
- The water, tourism and agricultural sectors offer the greatest potential to become 'buyers' for enhanced watershed services but in most instances consider themselves over-taxed or contributing adequately already. Progress towards PWS would need to be underpinned by valuation of sectoral contributions to and benefits from watershed services and an assessment of the efficacy and equity of existing tax regimes. Scope exists to enhance the contribution of such sectors primarily by:
  - involving them in integrated watershed planning;
  - increasing their linkages with and support for community-based managers;
  - developing sectoral policies that reflect the importance of watershed services (as is the case with the new agricultural incentives regime in Saint Lucia);
  - developing appropriate and attractive incentives; and
  - removing perverse incentives or subsidies (for example those that encourage the use of pesticides).
- Direct benefits are not the only motivation for buyers. For example, many of the incentives and rewards identified in the case of Fondes Amandes, Trinidad, came not from direct beneficiaries but from organisations and agencies with no direct stake in the protection of the watershed. Similarly, in Jamaica, the tobacco company Carreras funded reforestation projects under its corporate social responsibility programme not because it was a direct beneficiary of the watershed services. In Saint Lucia, some of the funding for the TWCG was secured under a Stabex programme designed to alleviate poverty after the decline in banana cultivation.

The project concluded that PWS must be considered as just one potential tool in watershed management and not as a panacea for the failures of other approaches. The scope for PWS in Caribbean SIDs is likely to remain limited to sites where the cost of the remedial action becomes affordable to the buyers: for example watersheds serving major urban centres or tourist resorts where concern over the loss of watershed services is high and there are enough people willing to pay. However, lessons from this examination of the role of PWS could usefully be incorporated in re-shaping and re-testing existing local management initiatives, incentive regimes and the enabling institutional framework.



# 1 Introduction

## 1.1 Report overview

This report describes an action-learning project encompassing five Caribbean countries and a wide range of watershed stakeholders. The project set out to create capacity in national and local institutions to assess the potential of economic instruments to enhance watershed protection services and improve livelihoods.

The report describes the different project components used to examine the potential of economic instruments to improve the quality and delivery of watershed services and local livelihoods, especially of the rural poor, and where possible to test them. These included: the creation of a regional Action Learning Group (ALG); two pilot projects in Talvern, Saint Lucia and the Buff Bay/Pencar watershed, Jamaica; studies of the potential contribution to enhanced watershed services of three key economic sectors (tourism, water and agriculture); and the analysis of two existing initiatives involving payment or incentives for community-based management of watershed resources. It also reviews the use of several tools including economic valuation of watershed services, hydrological assessment and participatory resource mapping.

The report analyses the outcomes, findings and lessons learned from each individual project component and from the project as a whole. In doing so, it also charts the process of action learning from the selection of the project activities, through the growing understanding of what PWS is and what economic instruments are currently used, to the drafting of some preliminary conclusions about the potential of economic instruments to enhance watershed services and livelihoods in Caribbean SIDS.

## 1.2 The study team's vision

In a formal sense, the study team can be said to comprise CANARI technical staff, the Sustainable Economic Development Unit (SEDU) of the University of the West Indies (UWI), Saint Augustine Campus, Trinidad, the other consultants who contributed to the project outputs, the IIED liaison person for the Caribbean and the members of the ALG. However, all participants in the project, whether at international, regional, national or local level, contributed to and benefited from the action-learning process and must therefore be considered members of the team.

As befits an action-learning process, the vision of what constitutes and contributes to sustainable watershed management in Caribbean SIDS and the role that PWS can play evolved as the project progressed. However, the initial project approach and design were underpinned by a broader framework of views, principles and objectives within the study team, including:

1. CANARI's overall vision of:
  - a socially cohesive Caribbean region with a reinvigorated sense of community and collective responsibility for its natural and cultural assets, forged through equitable participatory processes of visioning, decision making and management;
  - institutions, policy and practice that reflect a Caribbean model of development based on sustainable use of natural resources to meet the livelihood needs and aspirations of Caribbean people;
2. interest in sustaining participatory or community watershed management initiatives;
3. a degree of scepticism and/or suspicion within the region about the concept of 'markets', especially following the collapse of the banana industry, combined with a perception that support for markets by external agencies was increasing;
4. concern that the introduction of PWS would be to the detriment of the poor and vulnerable.



Action Learning Group field trip in Saint Vincent

The consensus of ALG members at the first ALG meeting was therefore that markets are simply one possible option that may or may not be viable in different situations in Caribbean SIDS. So the objectives of the project were modified to:

- contribute to the overall understanding in Caribbean SIDS of what constitutes effective and equitable watershed management that improves livelihoods, whether or not it involves payments;
- collect evidence on the prerequisites for and the use of market-based approaches and their impact on both the resource and livelihoods;
- test market-based approaches if sites that met the prerequisites could be found and to the extent possible within the short project timeframe;
- identify and promote the incentives and market-based approaches that have the greatest impact on livelihoods, particularly those of the rural poor;
- identify the capacity and institutional challenges in implementing such approaches in Caribbean SIDS and, where appropriate, suggest how these might be remedied;
- disseminate project learning widely to decision makers and watershed actors throughout the region through training, publications and personal interactions.

### **1.3 Status of payments for watershed services in the project countries**

The study team's understanding of the nature of and prerequisites for PWS evolved over the project period. At the start of the project, it was informed primarily by documented examples from other countries, notably those documented in *Silver Bullet or Fools Gold?* (Landell-Mills and Porras 2002). In the absence of any clearly identifiable PWS schemes in the region, the selection of the project countries, sites and case studies was based on the pre-project diagnostics (Bass and Geoghegan 2002; Geoghegan 2002; Krishnarayan 2002; Krishnarayan and Pantin 2002) and criteria outlined in section 2.1.

Initiatives reviewed by the project therefore included:

- provision of inputs, such as seedlings, and accompanying technical assistance to community groups (Jamaica, Saint Lucia, Trinidad and Saint Vincent);
- tax incentives and duty exemptions, particularly those provided to farmers and the tourism industry (Saint Lucia, Jamaica);
- payment by utility companies of a percentage of their surplus to support community-based reforestation (Saint Vincent);
- seasonal employment by the Forestry Department of community members as fire wardens (Fondes Amandes, Trinidad);
- informal acceptance by the water authority of squatter community on its land in recognition of the beneficial effect of its reforestation activities on water quality (Fondes Amandes, Trinidad).



Fondes Amandes nursery

None of the schemes analysed met all the criteria normally ascribed to PWS (see Wunder 2005) and there are still no identified PWS schemes in the project countries. The project findings indicate that the feasibility of implementing PWS schemes in Caribbean SIDS is (and is likely to remain) limited.

### 2.1 The development of the project

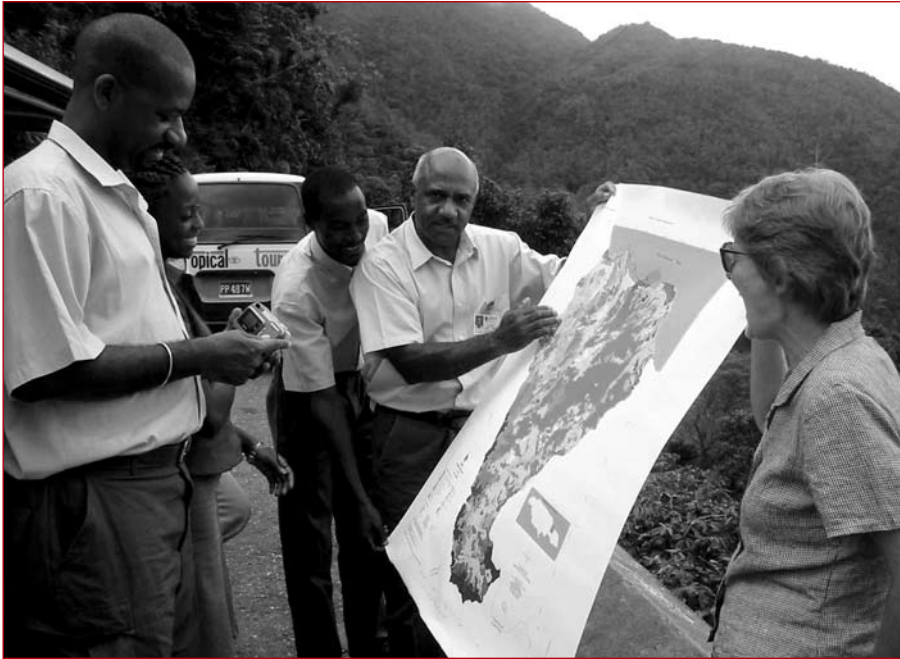
The action-learning phase of the project was preceded in 2002 by diagnostic studies of four countries: Jamaica, Saint Lucia, Grenada, and Trinidad and Tobago (Bass and Geoghegan 2002; Geoghegan 2002; Krishnarayan 2002; Krishnarayan and Pantin 2002). After completion of the diagnostics, representatives from the four countries were brought together in a workshop to confirm interest and develop the outline of a follow-up action-learning project, which is described in the Phase II project proposal (CANARI 2002).

The criteria used for the initial selection of project countries, sites and case studies that might prove suitable for the testing of economic instruments included the following:

- level of national or local concern about the degradation of watersheds and watershed services and/or the increasing costs of watershed management and water supply;
- whether the country had or was in the process of privatising water supply or introducing metering for water;
- ability to build on existing experiments or incentive schemes that had the dual objective of improving watershed services and contribute to livelihoods;
- availability of data: for example, a lot of data had been collected on Buff Bay/Pencar under the Trees for Tomorrow project funded by the Canadian International Development Agency (CIDA) and the government of Jamaica;
- ability to build on existing relationships between watershed managers (formal or informal) and the beneficiaries of watershed services;
- the willingness of the agencies with formal responsibility for watershed management (usually the Forestry Department) to collaborate in the project;
- the potential to leverage additional resources provided by externally funded projects (for example the Trees for Tomorrow and Ridge to Reef Watershed project in Jamaica and poverty reduction/structural adjustment funds in Saint Lucia);
- presence of economic actors who are clear beneficiaries of watershed services but perceived not to be paying the full costs (for example the tourism, water and agriculture sectors).

Additional project components were subsequently added or modified to enrich the learning experience and focus on overlooked or emerging issues. For example, it became increasingly clear that agricultural incentives play a major role in defining





Reviewing the map of the Buff Bay/Pencar watershed

watershed management and should therefore be addressed by an agriculture sector study (Thomas-Louisy and Edwards 2006). The 2003 Cabinet intervention in Saint Vincent to force major utility companies to underwrite an Integrated Forest Management and Development Programme (IFMDP) provided a new opportunity to assess PWS (John 2006). The tourism sector study had initially identified certification schemes that evaluated water quality as a potential entry point for PWS. However, it later became clear that a broader approach to the involvement of the tourism sector in watershed management was needed (Leotaud 2006). Because water privatisation in the region had not progressed as originally anticipated, the water sector study was adapted to look more broadly at the drivers of change in water sector policy (Springer 2005a – c). A study tour to Costa Rica was organised to allow Caribbean change agents to see working examples of PWS (CANARI 2006f).

From the outset, there was a strong emphasis on the process of action learning, with the first ALG meeting being dedicated mainly to clarifying the role of the members and validating the proposed project objectives, design and communication strategy (CANARI 2004a). Further detailed discussion of the definition of and prerequisites for PWS did not take place again until the fourth ALG meeting (CANARI 2006a), at which an IIED staff member made a presentation on the findings of the global project and the wider debate on definitions. Subsequent project analyses

were informed in part by the five criteria identified that he introduced, drawing on Wunder (2005):

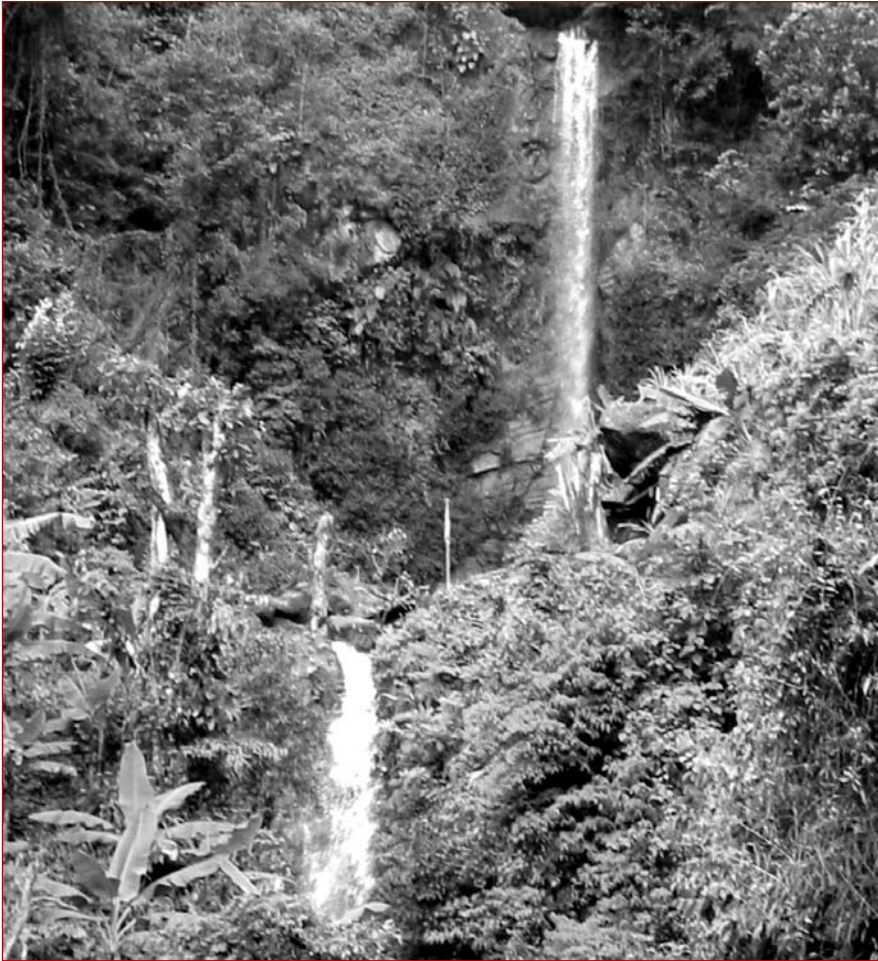
1. a voluntary transaction;
2. focused on a well-defined environmental service (or a land use likely to secure that service);
3. 'bought' by at least one buyer;
4. from a minimum of one environmental service provider;
5. if – and only if – the environmental service provider secures conditionality.

ALG members found the definition useful in the process of clarifying the impediments to PWS in Caribbean SIDS. It also provided a useful framework for participants in analysing the scope for PWS in their respective countries (CANARI 2006h).

## 2.2 Project methodology

The project broadly adhered to the proposed methodology outlined in the Phase II project proposal (CANARI 2002). This included the following:

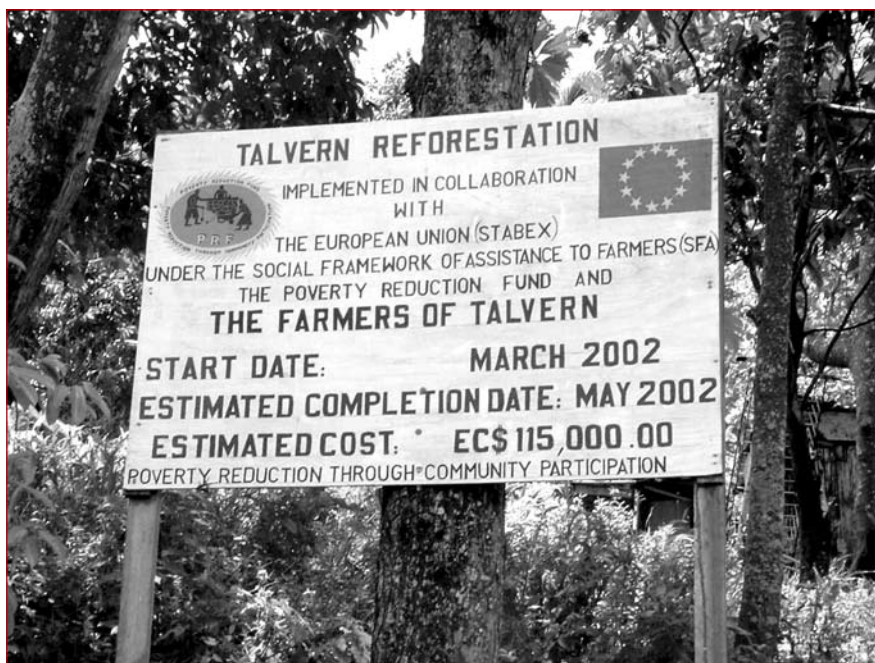
1. The creation of multi-sectoral, regional ALG to support the development of a shared understanding across the region of watershed approaches that work to improve the environment and the livelihoods of poor and vulnerable groups, by building a community of change agents prepared to adapt and shape new watershed market initiatives and disseminate learning from the project. The ALG met five times over the project period in four different countries (CANARI 2004a,b, 2005a, 2006a,b).
2. *Action-learning pilot projects* based on existing community watershed management initiatives in the Talvern watershed, Saint Lucia and the Buff Bay/ Pencar watershed, Jamaica. The aim was both to sustain these initiatives and to examine the potential for economic valuation of watershed services (and their loss) to stimulate complementary PWS.
  - a. The Jamaica Action Learning Project (CANARI 2006c) examined the potential and mechanisms for payments for watershed services (PWS) in the Buff Bay/ Pencar watersheds, with a particular focus on sustaining the activity of the local forest management committees (LFMCs) through:
    - an economic valuation study to attach costs to the loss of watershed services and justify more appropriate land-use interventions (Pantin and Reid 2005);
    - a survey of existing and potential incentive mechanisms for better watershed management in the Buff Bay/Pencar Watershed (CANARI 2006c);
    - establishment of a national ALG which met formally or informally throughout the project to evaluate project learning and assess the possible development of PWS mechanisms;



Buff Bay/Pencar watershed

- a small grant to sustain LFMC activities in the absence of PWS mechanisms.
- b. Saint Lucia Action Learning Project (CANARI 2006d), which examined the impacts of the activities of the TWCG on watershed services and livelihoods as well as the potential and mechanisms for PWS, including:
  - a hydrological assessment and watershed management plan for the Talvan water catchment to identify critical problem areas and those responsible for them (Cox 2004);
  - a valuation study of the contribution that the TWCG made to improving watershed services (Pantin *et al.* 2006);
  - establishment of a national Action Learning Group which met on four occasions to evaluate the potential of PWS and/or alternative mechanisms to sustain groups such as the TWCG and the necessary institutional framework.

3. Case studies based on site visits to and brief analyses of existing examples of community involvement in watershed management were proposed as a means by which the ALG could expand its learning through site visits.
- a. The first case study was of the Fondes Amandes Community Reforestation Project (FACRP), an initiative of a community of informal settlers which eventually secured tacit or explicit support for its watershed conservation efforts from a range of governmental and donor agencies. A brief analysis was done in preparation for a field visit during the first ALG in July 2004. However, as this revealed both a more complex institutional structure than originally anticipated and a range of potentially useful lessons for other watersheds, a more extensive analysis was subsequently conducted (Lum Lock and Geoghegan 2006).
  - b. The second case study examined the Integrated Forest Management and Development Programme (IFMDP) in Saint Vincent, a government initiative involving payments from state-owned utility companies through the Forestry Department to encourage the development of local forest user groups (LFUGs) and provide incentives to former marijuana growers for reforestation and watershed protection. In this instance, a draft case study was prepared in advance and refined by an ALG site visit and panel discussion at the third ALG (CANARI 2005a; John 2006). A small grant was again provided to sustain LFUG activities in the absence of PWS mechanisms.



Sign promoting the Talvern reforestation project

4. Research on strengthening links with key sectors. Two studies were proposed to understand the extent to which privatisation of the water sector and voluntary tourism certification schemes provide financial and other types of support for watershed protection by these sectors, and to demonstrate ways in which upstream – downstream links might be strengthened through the use of market-based approaches. The selection of these sectors was based in part on the perception that they do not pay enough for the watershed services they receive, so are effectively subsidised by others, particularly government agencies.

These studies were subsequently reconceptualised somewhat for the reasons noted in section 2.1. A third study on the actual and potential contribution of incentive regimes in the agricultural sector in Saint Lucia and Jamaica was subsequently added because the sector currently provides the most extensive range of incentives and farmers both benefit from watershed services and contribute to their degradation.

- a. A tourism sector study, which examined the potential for the Caribbean tourism sector to support good upper watershed practices using market-based mechanisms including:
  - preliminary assessment of the potential of widely used tourism certification schemes such as Green Globe and Blue Flag, which was discussed at the sector forum;
  - regional tourism sector forum, held in Castries, Saint Lucia, in December 2004 to familiarise sector specialists and ALG members with the issues and options (CANARI 2004c);
  - case studies of Dunn's River/Ocho Rios, Jamaica and Speyside, Tobago, to assess the watershed services afforded to the tourism sector, threats to those services and possible options to address those threats (including PWS) (Leotaud 2006).
- b. A water sector study, which set out to examine the extent to which market-based approaches at both the supply and demand sides of the water cycle might lead to the internalisation of the costs of watershed protection services through:
  - a situational analysis of cost pricing for water production and water protection services in Saint Lucia and Jamaica (Springer 2005a – c);
  - a regional water sector forum held in Kingston, Jamaica, in January 2006 to discuss the policy environment of the water sector in Jamaica, Saint Lucia and the other project countries with sector specialists and ALG members and to explore options for PWS (CANARI 2006f).
- c. An agriculture sector study, which examined the current and potential role of agricultural incentives in promoting good watershed practices, including:
  - an analysis of the potential of agricultural incentives to contribute to PWS in Saint Lucia and Jamaica (Thomas-Louisy and Edwards 2006);



- a survey of incentive regimes in the Buff Bay/Pencar watershed (CANARI 2006c);
- an agriculture sector forum in September 2006 in Port of Spain, Trinidad, to familiarise sector specialists and ALG members with the issues and explore options for PWS and incentives (CANARI 2006g).



Speyside Bay

5. Dissemination of learning. It was envisaged that part of the ALG's role would be to identify the approaches, tools and methods that optimise the impact of market mechanisms on livelihoods, with dissemination of project learning through a variety of media and channels. The outputs under this heading are described in more detail under section 3.2.
6. Project management arrangements. The original concept note characterised the project as a joint initiative of the member organisations of the ALG, with individual members or teams of members taking responsibility for implementing the various project activities and documenting their results. CANARI would provide overall coordination and administration, serving as the key contact for international partners, and providing the secretariat for the ALG Group (CANARI 2002).

Members of UWI SEDU played a key role in the design and implementation of the valuation studies for the two main pilot projects and the discussions on potential incentives at the national ALGs. SEDU also designed and facilitated the valuation training workshop, wrote the valuation guidelines and provided significant input to the tourism studies.

The valuation study for the Buff Bay/Pencar watershed was funded by and designed in conjunction with the United States Agency for International Development (USAID), Jamaica. USAID staff also participated in Jamaica ALG meetings.

The Forestry Departments in Jamaica and Saint Lucia served as the convenors and hosts of the national ALGs and also provided invaluable information and support to the valuation research and the ALG meetings.

The project design assumed that the Integrating Watershed and Coastal Areas Management (IWCAM) project, being implemented by the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP) and co-executed by the Caribbean Environmental Health Institute (CEHI), would come on stream at the same time as *Who Pays for Water?* and would provide financial and technical support and inputs to the Saint Lucia component. In fact, the IWCAM project only started as the other project closed but CEHI staff attended all ALG meetings and there has been some discussion of incorporating the current ALG into the IWCAM framework.

The presence of an IIED staff member at most regional ALG meetings and of a CANARI staff member at global project meetings meant that project learning from the wider global project could be incorporated into the Caribbean debate.

However, despite the valuable input of project partners, CANARI played a significant role in the implementation of most project components, so the concept of independent implementing teams was not fully achieved.

## 2.3 Regional context

The regional context remains largely unchanged from that outlined in the project concept note (CANARI 2002), with continuing concern about the deterioration of watershed services. Several regional projects came on stream during the period, which reflect this concern, including IWCAM and two projects designed to mainstream and build capacity for sustainable land management.<sup>1</sup>

Landslides and flooding as a result of soil erosion continue to be a major problem, exacerbated during the project period by the increased hurricane activity of 2004 and 2005. Efforts to remediate the deterioration are usually targeted at the small-scale farmer or landowner to little effect if other activities, such as land clearing

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1. The *LDC-SIDS Targeted Portfolio Project for Capacity Building and Mainstreaming of Sustainable Land Management* (UNDP Global Environment Facility – GEF) and *Preventing Land Degradation in Small Island Ecosystems in the Caribbean through Sustainable Land Management* (implemented by UNEP, executed by CEHI and OAS).

for houses or road cutting, are taking place unhindered higher up the watershed as was the case in Talvern.

It is too early to assess the impact of the larger-scale reforestation projects that also seek to address livelihoods, such as the IFMDP in Saint Vincent and the National Reforestation and Watershed Rehabilitation Project (NRWRP) in Trinidad. On the other hand, some reversion to secondary forest is evident in the countries that have suffered from the decline of the banana industry (for example Saint Vincent and the Grenadines, and Saint Lucia). Although the resource may be beneficial, livelihoods have been severely affected, with many farmers abandoning agriculture completely. In other instances, legal farming has been replaced by the cultivation of marijuana, which again involves clear cutting and generally takes place in the more inaccessible areas of the watershed.



**Landslide at Speyside Bay**

The reliability of the water supply, both in terms of quality and quantity, varies from island to island but it is consistently the poor, and predominantly the rural poor, who receive the worst service. Despite policies that seek to achieve equity in allocation, in practice water allocation, like land-use decisions, usually prioritises supply to the drivers of the national economy. Widespread soil erosion is commonplace throughout the Caribbean SIDS, with major impacts on water supply and watershed fertility. Scenic beauty and biodiversity are also critical watershed services in the Caribbean, not least because of the heavy livelihood dependence on the tourism industry.



Details of the changes at country level over the project period were presented in the form of updates to the diagnostics at the fourth ALG meeting (CANARI 2006d). Although the changes varied from country to country, some general points were identified and summarised as follows:

- increased knowledge about the options for watershed management;
- more linkages between stakeholders and greater use of participatory processes in watershed management;
- shifts in national economic and development priorities;
- changes in land use (for example conversion of agricultural land for housing or tourism).

Identified drivers of change included natural disasters (for example Hurricane Ivan in Grenada and Jamaica) and the concomitant raised awareness both of the services provided by watersheds and the current degree of degradation. Also of significance were the changes in the national and regional economy, principally externally driven, for example decline in the banana and sugar industries, and the increase in oil prices. These in turn had led to changes in external donor funding (for example post-Hurricane-Ivan relief and European Union (EU) Stabex funding).

The pace of implementation of market instruments, such as metering and full-cost pricing, has been slower than anticipated in 2002. The situational analysis of cost pricing for water production and water protection services in Jamaica and Saint Lucia (Springer 2006a – c) identified deep and wide-ranging challenges in financing water production and protection services in SIDS, notably the determination of the real value of water and the management of water allocation in a way that is both equitable and supports the countries' economic development strategies.

Several new funding mechanisms have been introduced in Jamaica during the period, including:

- the National Forest Management and Conservation Fund, as proposed in the National Forest Management and Conservation Plan, was established but not fully capitalised;
- the Tropical Forest Conservation Fund, a debt for nature fund which was established to receive payments negotiated from the debt swap agreement between Jamaica and the USA, under the Tropical Forest Conservation Act;
- the Jamaica Tourism Enhancement Fund, which is based on the collection of head taxes from tourists and includes a fairly loose objective of environmental enhancement.

On the other hand, the Green Fund in Trinidad, which is based on a tax on company turnover and prioritised reforestation and watershed rehabilitation projects, has still not been implemented although it has been accumulating funds since 2000 and

is estimated to be worth more than TT\$1 billion as a result of the rise in oil prices over the period.

Although the external donor community remains interested in the concept of improving environmental services through the use of markets, this has not translated into concrete initiatives in the region on the scale originally anticipated. It is not clear whether this is because there is growing recognition that their use may be limited in the context of Caribbean SIDS or for other reasons.

## 2.4 Brief description of the project sites

Table 1 describes the main characteristics of the six project sites. The case study of Fondes Amandes is of a specific community project in a sub-watershed of the St Ann's watershed, so the data relate only to the community and the land that it manages, not the entire watershed. The case study of Saint Vincent covers the IFMDP programme and not a specific watershed; therefore data for the entire Island of Saint Vincent have been included.

More detailed information on the project sites can be found in the following project reports:

- Buff Bay Pencar Watershed: Pantin and Reid (2005), CANARI (2006c);
- Talvern Watershed: Cox 2004, Pantin *et al.* (2006), CANARI (2006e);
- Dunn's River Watershed: Leotaud (2006);
- Speyside Watershed: Leotaud (2006);
- Fondes Amandes: Lum Lock and Geoghegan (2006);
- Saint Vincent: John (2006).

## 2.5 Assessment of the contribution of the action-learning approach to project management

The regional ALG proved to be a highly effective mechanism for overcoming several of the challenges experienced during project implementation. For example, although the composition of the CANARI project team changed completely between the diagnostic phase and the final stages of implementation, the ALG provided the continuity, expertise and institutional memory that might otherwise have been lost. Similarly, when some of the original project assumptions proved to be unfounded (for example the imminence of water privatisation in Saint Lucia; the availability of hard data to confirm the impact of TWCG on water quality, quantity and livelihoods), ALG members played a key role in helping to redesign the relevant project components.

Table 1

Project site	Buff Bay/Pencar watershed, Jamaica	Talvern watershed, Saint Lucia	Dunn's River watershed, Ocho Rios, Jamaica <sup>2</sup>	Speyside watershed, Tobago <sup>3</sup>	Fondes Amandes Community Reforestation Project, Trinidad	Island of Saint Vincent <sup>4</sup>
<b>Population</b>	Approximately 24,000 people in a predominantly rural area with few large settlements and many scattered small villages (2005).	Rural community comprising 315 households (2005).	Main town in watershed is Ocho Rios, with population of approximately 20,000 (2005) <sup>5</sup> . In 1991, there were approximately 4,000 persons in the mid- and upper watershed, with 1,300 persons in the three informal communities in upper watershed.	Speyside is a small coastal village of approximately 1,000 persons (2000).	Thirty-seven families of informal settlers, making a total of about 160 residents (2005).	106,000 (2004).
<b>Area and elevation</b>	20,200 ha and rising from sea level to 1,600 m in the Blue Mountain range.	Elevation ranges from 60 to 265 m above sea level. 'Micro-watershed' is 320 ha in size.	Over 19,000 ha and encompassing several sub-watersheds.	Rises up to 650 m above sea level. 'Micro-watershed' only a few square kilometres.	Community currently responsible for an area of 100 acres.	34,399 ha whole island, highest point is Soufriere at 1,234 m.
<b>Topography and drainage</b>	Very steep slopes (ranging from 20° to 35°), narrow ridges, numerous gullies, and many streams which flow into one of the four rivers draining the watershed.	Variable although slopes are not excessively steep but ranging up to 30° in rugged upper area. One main river (measures 3,435 m) and seven tributaries collectively measure 5,200 m.	Very steep slopes in upper watershed, dissected by gullies. Shallow soils underlain by limestone, with significant reserves of bauxite and high-grade limestone. High erosion potential. Drained by Dunn's River, Roaring River and Cave River systems. Significant aquifer.	Steep slopes in upper and mid watershed. Drained by one small river system.	Steep slopes of 30–40° on the ridgeline and about 45° closer to the ravines.	Extremely rugged terrain, with slopes up to 30°.

2. Environmental Solutions Ltd. 2003. Dunn's River Watershed Baseline Environmental Assessment. Environmental Foundation of Jamaica, Kingston.

3. [http://www.procaribe.org/networks/clawrenet/reports/z\\_tt/ttmp221.htm](http://www.procaribe.org/networks/clawrenet/reports/z_tt/ttmp221.htm), accessed on 22 January 2007.

4. <http://www.answers.com/topic/saint-vincent-and-the-grenadines>, accessed on 22 January 2007 and Williams (2003). Under subcontract to Development Alternatives, Inc. Financed by the US Agency for International Development, BASIS IQC LAG-I-00-98-0026-0 accessed at <http://www.basis.wisc.edu/live/St-%20Vincent.pdf>, accessed on 22 January 2007.

5. <http://jamaica-guide.info/accommodations/a.to.z.hotels/sandals.dunn.s.river.golf.resort.and.spa/nearby/>, accessed on 22 January 2007.

<b>Upper watershed soils, infiltration and runoff</b>	Generally shallow, clay-based and low in nitrogen and phosphorous. They are located on a shale base over impermeable rocks. This means rapid internal drainage, high erosion hazard and little infiltration into the subsurface.	Typically deeply weathered lateritic soil that is easily eroded under poor land management practices.	Loamy soils with low to medium fertility. Potential for erosion on steep slopes.	Haplic Lixisols. Potential for erosion on steep slopes.	The slopes higher up have lost most of their top soil and are down to hard-packed red clay and stone. Lower down, where the project has been established longer, the hummus layer is building.	Young volcanic soils, free or well-drained, shallow, acidic and leached in some areas. High potential for serious erosion. <sup>6</sup>
<b>Rainfall and surface water</b>	High rainfall, averaging 2,502 mm/yr; average annual surface water yield is 292 mm <sup>3</sup> /yr (50 mm <sup>3</sup> /yr reliable yield) and the Buff Bay and Pencar Rivers are used extensively to supply potable water to the adjacent communities and the coastal towns.	Mean annual rainfall approximately 2,380 mm. Talvern watershed produces 600,000–900,000 mm <sup>3</sup> /yr water used for potable supply.	Annual rainfall ranges from 1,243 mm at Ocho Rios to 1,676 mm in upper watershed. Streamflow at Dunn's River (which is the main river and is fed by several springs) recorded ranging from 0.03 to 0.71 m <sup>3</sup> /s in 2002.	Tobago annual rainfall is 2,500 mm. <sup>7</sup>	Trinidad has an average annual rainfall of 2,110 mm, but mountainous areas receive 3,810 mm.	Rainfall ranges from 7,000 mm/yr in the interior to 1,700 mm in the coastal region. The thirteen key watersheds yield approximately 120 million m <sup>3</sup> per year of surface water.

6. Murray (2003).

7. [http://en.wikipedia.org/wiki/Geography\\_of\\_Trinidad\\_and\\_Tobago](http://en.wikipedia.org/wiki/Geography_of_Trinidad_and_Tobago), accessed on 22 January 2007.

<b>Project site</b>	<b>Buff Bay/Pencar watershed, Jamaica</b>	<b>Talvern watershed, Saint Lucia</b>	<b>Dunn's River watershed, Ocho Rios, Jamaica</b>	<b>Speyside watershed, Tobago</b>	<b>Fondes Amandes Community Reforestation Project, Trinidad</b>	<b>Island of Saint Vincent</b>
<b>Land tenure</b>	Approximately 75% of the land in the watershed is privately owned, over 80% is in small parcels (5 acres or less).	95% private ownership with less than 5% under protection within the Government Forest Reserve, mostly small parcels (240 land parcels in the watershed).	Significant proportion of the upper watershed is in government control; three main informal settlements in upper watershed.	Upper watershed state land; mid watershed largely private lands that are former agricultural estate with informal settlements; lower watershed and coastal area mixed private and public.	Mix of state and private land, with informal settlement in the Fondes Amandes community.	Traditionally large parcels of land owned by government and a few private estates. Difficulty in accessing land revealed by the large proportion of informal rental arrangements, unclear tenure of family land and the extremely high incidence of informal settlement. One estimate put the number of informal settlers at 16,000.
<b>Land use</b>	Over 90% land used for various agricultural crops: coffee, bananas, fruit trees, other permanent crops, and mixed agro-forestry.	Approximately 28% of the watershed is under intensive agriculture (predominately bananas, but also root crops, fruit trees, livestock rearing) and settlement. Estimated that just over 36% of the land area was being utilised unsustainably based on recommended land management.	Approximately 72% of watershed has some permanent vegetative cover. Forest is the dominant land cover in the upper watershed, the mid watershed has significant forest and agro-forestry with little settlement, and the lower watershed has mixed used with much more agriculture settlement, beaches, ports, and town activities.	Upper watershed forested; lower slopes and practically all of the flat coastal areas in Tobago have been deforested for agriculture and housing, with some areas reverting to secondary forest.	Upper watershed once forested, with considerable areas of fire climax grassland. Some of this transformed into 30 ha of organic agro-forestry.	Approximately 26-30% of the island is covered by forests and 18% by agriculture, predominantly banana.

<b>Use of watershed services</b>	Surface water is the main source of potable water in Jamaica. Surface water also used for agriculture.	Talvern watershed accounts for approximately 40-50% of the water supplied to the capital of Castries for its potable water supply.	Dunn's River Falls and tourism attractions depend on healthy watershed. One hydroelectric plant. Extraction for potable water supply.	Tourism attractions depend on healthy watershed. Extraction for potable water supply.	Extraction for potable water supply.	Surface water serves as the primary source for meeting domestic and other water demands and for generation of hydroelectricity, which meets 14-26% of the nations electricity demand depending on the season.
<b>Watershed issues</b>	Soil erosion and increased flood runoff caused by the combination of steep slopes, heavy and highly intense rainfall, soil type, and land use. Landslide hazards. Although surface water quality fairly good, some evidence of possible contamination of the river by agricultural activities as well as possibly from sewage effluents from human settlements. River bank erosion, downstream sediment deposits and flooding.	Extremely poor raw water quality with consistently elevated turbidity, nitrate and faecal coliform levels. Fertiliser and pesticide contamination from agricultural activity. Contamination from livestock rearing (although relatively minor) increased sedimentation and pollution through grey water and sewerage discharge from recent urban expansion. Washing of vehicles, dumping of refuse and bathing in the river.	Loss of biodiversity (including coral reefs). Water pollution (point and non-point sources) Soil erosion and sedimentation and loss of soil fertility. Blocked drains and flooding caused by: deforestation; poor farming practices; washing cars in rivers; pollution from mining; land clearance for housing: formal and informal developments; poor sewage and solid waste disposal.	Soil erosion, landslides and siltation of marine ecosystems – including reef damage. Informal settlement and slash and burn agriculture. Indiscriminate logging and river mining on private land. Solid waste pollution. Water pollution by sewage and grey water.	Annual bush fires during the dry season, mainly generated by the lighting of fires by community members to burn solid waste dumped in the community by outsiders. Deforestation (from subsistence agriculture and housing settlements) leading to excessive soil erosion and flooding during the rainy season, and resulting in heavy siltation of the river and waterworks.	Forest cover in St Vincent has declined severely over the past few decades, driven in large part by farmers planting bananas in forest reserves and currently by illegal marijuana plantations. Severe erosion problems. Water quality problems due to unregulated use of pesticides and fertilisers and sedimentation.

<b>Project site</b>	<b>Buff Bay/Pencar watershed, Jamaica</b>	<b>Talvern watershed, Saint Lucia</b>	<b>Dunn's River watershed, Ocho Rios, Jamaica</b>	<b>Speyside watershed, Tobago</b>	<b>Fondes Amandes Community Reforestation Project, Trinidad</b>	<b>Island of Saint Vincent</b>
<b>Income sources</b>	Primarily agricultural, dominated by two main forms of agricultural activity, bananas on the coast and coffee in the upper Buff Bay area (accounting for almost 30% of production of the premium Blue Mountain Coffee in Jamaica).	Primarily an agricultural community with some waged employment (often outside the community) and many persons pursuing multiple livelihood strategies.	Ocho Rios is one of the biggest resort areas and the largest cruise port in Jamaica and has a well-developed tourism sector that generates an income well in excess of US\$357 million each year, reflecting 27% of Jamaica's annual tourism revenue. Agriculture is also an important primary and secondary livelihood strategy.	Primary economic driver in Speyside is tourism industry, which focuses on a niche market, primarily diving and other nature-related activities, and brings in a total income contribution of only US\$6.4 million annually. Speyside has a high level of unemployment (22%) with the public sector being the main source of employment (26%) followed by tourism with 14%.	Majority of adults in Fondes Amandes work outside the community, although many have multiple livelihood activities, which include some subsistence farming. FACRP has developed eco-tours, organic agro-forestry business and the leader runs a jewellery business, based on the use of materials from the watershed.	10% of GDP from agriculture, 26% from industry, and 64% from services, primarily from growing tourism industry. Unemployment rate of 22%. Estimated that illegal marijuana sales and exports account for close to a fifth of Saint Vincent's GDP. In 2002 it was estimated that there were as many as 1,500 marijuana farmers cultivating in excess of 1,200 ha.

### 3.1 Introduction

The project contributed substantially to the primary objective of creating capacity in national and local institutions to assess the potential of economic instruments to enhance watershed protection services and improve livelihoods. The report therefore focuses mainly on the action-learning process and its outcomes in terms of enhanced capacity.

Most of the project sites proved unsuitable for testing PWS, owing to a combination of lack of willing buyers, insufficient hydrological and socioeconomic data, and small geographical scale. Although the project findings are not conclusive, it is inferred that most watersheds in the Caribbean are too small for PWS to function effectively because they would demand a level of investment that is not commensurate with the benefits secured.

The action-learning process also served as a catalyst for a wider debate on effective watershed management in the Caribbean, with a particular focus on how to increase the contribution of watershed-dependent economic sectors and how to incorporate the valuation of watershed services into their management.

### 3.2 Summary of major project outputs

#### 1. Sustainable regional ALG with members able to assess PWS as one tool for improved watershed management and livelihoods in Caribbean SIDS.

A strong regional multi-sectoral watershed Action Learning Group (ALG) comprising about 25 people was established, with new members being co-opted as the research process identified sectoral, geographical or skills gaps (see Annex 1 for full list of ALG members). All members evaluated the action-learning process as one that had led to individual enrichment, with ongoing potential to influence the organisations, institutions and sectors in which they operate through dissemination and application of project learning. Specific areas in which ALG members felt their capacity had been built through the ALG and associated activities were:

- reaching greater clarity on the definition of and differentiation between watershed-related ecosystem services (water quality maintenance, water flow regulation, erosion and sediment control, biodiversity conservation, scenic beauty) and the often 'bundled' nature of the services to beneficiaries;
- understanding the range of market-based instruments and incentives which are or might potentially be applied in the context of watershed management in Caribbean SIDS and their advantages and constraints;



- understanding the methodologies used to value ecosystems services and the application of valuation to improved decision making and communication between different sectors and interests;
- understanding of the tools for effective watershed management such as hydrological assessments and participatory resource management;
- understanding of the enabling factors and institutional structures which facilitate the application of PWS, notably through the Caribbean study tour of institutional arrangements for PWS in Costa Rica;
- identification and pooling of expertise within the region which may not exist at the national level (and which it may never be viable to build at the level of each individual island).

**2. Strong multi-sectoral national teams with enhanced capacity to collect the baseline hydrological, socioeconomic and institutional data needed to make payments for watershed services a useful tool for improved watershed management and livelihoods in Caribbean SIDS and to analyse the policy and institutional gaps at the national level.**

The capacity of the national teams (comprising regional ALG members and other non-governmental organisation (NGO) and government technical staff who participated in the national ALGs or attended training workshops) has been built through:

- participation in the training modules on economic valuation (CANARI 2005b); land use and hydrology assessment and participatory resource mapping (CANARI 2005c); and Caribbean study visit to Costa Rica to examine institutional arrangements for 'Markets for Environmental Services' (CANARI 2006h);
- participation in the national ALGs overseeing the implementation of and reviewing of the findings from the two pilot projects in Buff Bay/Pencar, Jamaica (Pantin and Reid 2005; CANARI 2006c,d) and Talvern, Saint Lucia (Cox 2004; Pantin *et al.* 2006; CANARI 2006e);
- participation in field trips to project pilot and case-study sites during ALG meetings and training workshops (CANARI 2004a,b, 2005a, 2006a,b);
- the process of assessing the scope for introducing PES in Jamaica, Trinidad and the OECS during the Costa Rica study tour and final ALG (CANARI 2006b,h).



**Young Costa Rican PES beneficiary**

**3. Research findings that contribute to understanding the potential and prerequisites for PWS to play a role in improved watershed management and livelihoods in three sectors critical to development in Caribbean SIDS: tourism, water and agriculture.**

The research findings are documented in the following and the key findings are presented in section 3.2:

- Tourism sector: CANARI (2004c), Leotaud (2006).
- Water sector: Springer (2005a – c), CANARI (2006f).
- Agriculture sector: Thomas-Louisy and Edwards (2006), CANARI (2006g).

**4. Practical lessons from two case studies analysing the actual and potential role of PWS to support existing watershed management initiatives involving community-based organisations.**

The research findings are documented in the case studies of the FACRP in Trinidad (Lum Lock and Geoghegan 2006) and of the IFMDP and Forest User Groups of Saint Vincent and the Grenadines (John 2006). The key findings are presented in section 3.2.

**5. Research findings widely disseminated throughout the Caribbean and beyond.**

Project learning has been disseminated and continues to be disseminated in a range of formats including:

- policy briefs (CANARI 2004d);
- training materials and reports (CANARI 2005b,c, 2006h);
- ALG meeting reports (CANARI 2004a,b, 2005a, 2006a,b);
- sector study and forum reports (Leotaud 2006; Springer 2005; Thomas-Louisy and Edwards 2006; CANARI 2004c; 2006f,g);
- Jamaica and Saint Lucia pilot project reports (Pantin and Read 2005; Pantin *et al.* 2006; CANARI 2006c–e);
- case-study reports (John 2006; Lum Lock and Geoghegan 2006);
- guidelines (Pantin and Ram 2006, Smith 2006).

Channels for disseminating project materials and learning have included:

- distribution of hard copies by mail and at relevant workshops and conferences;
- e-mail distribution of electronic copies;
- a dedicated page on CANARI's website, [www.canari.org/alg.htm](http://www.canari.org/alg.htm), and a link from IIED's project page, [www.iied.org/NR/forestry/projects/water.html](http://www.iied.org/NR/forestry/projects/water.html);
- presentations of project findings at relevant regional, national and sectoral workshops, conferences and meetings by CANARI staff and ALG members;
- training workshops;
- global Project Advisory Group meetings.

### 3.3 Summary of major project findings

#### 3.3.1 Policy and institutional framework for management of watershed services

The drivers of the national economy in most project countries are tourism and agriculture, with the exception of Trinidad where it is the energy sector. Watershed management is accorded a relatively low priority, and land-use and water-allocation decisions are based largely on meeting the demands of these economic sectors.

The policy and institutional landscape for watershed management is complex and fragmented in most project countries. Integrated planning has entered the rhetoric of watershed management but the practice is lagging behind. Most countries have a plethora of policies and laws covering, and agencies involved in, different aspects of the management or regulation of watershed services (typically the state agencies or departments involved in forestry, agriculture, planning, environment, water supply and regulation).

Jamaica remains unique in having a single agency, the National Environment and Planning Agency (NEPA), which implements policy for both environment and planning. Jamaica has also led the way in piloting multi-sectoral watershed management groups at various levels, such as the National Integrated Watershed Management Council (NIWMC) and the local watershed management councils (LWMCs). However, the ALG questioned their effectiveness in the absence of a legal mandate, a clear strategic plan or effective communication channels between the national and local level (CANARI 2006a).

With the exception of Jamaica, there are few formal opportunities for cross-sectoral dialogue, and legislation is often overlapping or conflicting. Enforcement of legislation is weak, through a combination of lack of political will and inadequate enforcement capacity.

The interest by policy makers in assessing the potential of PWS reflects a climate of growing concern about the pace of watershed degradation and acknowledgement that the current 'command and control' approach is failing. However, this interest is tempered by the widespread public perception in the region that water is not just an economic good but also a social good that should be subsidised, especially for the poor. Two national watershed management priorities identified in varying degrees in all the project countries are:

- to increase equity in the allocation of watershed services and in the costs and benefits of maintaining them; and
- to encourage the participation of stakeholders in watershed management,

particularly communities in the watershed and, increasingly, the economic sectors that depend on and benefit from them.

This has led to an emphasis on creating an enabling environment for participation and providing incentives to encourage positive behaviour change that are anchored more to concepts of social justice than market efficiency. The section below analyses the extent to which these incentive schemes contain elements of PWS or might provide a basis for it.

### **3.3.2 Existing incentive regimes**

As noted in section 1.4, the project examined the range of different types of incentive that are currently available in the project countries. In general, only those piloted by the forestry departments had the specific objective of improving watershed services. These included inputs and technical assistance for reforestation and riverbank stabilisation as well as financial support for public awareness programmes designed to modify the behaviour of people in the upper watershed. Most of these schemes also included explicit subsidised livelihood components with a focus on revenue generation (for example management of a nursery and development of an ecotourism project in Buff Bay/Pencar), employment (for example under forestry department projects or programmes), and social cohesion and networking (for example creation of community-based water catchment groups in Saint Lucia).

The outcomes of these schemes proved difficult to assess for a variety of reasons: lack of clearly stated objectives; limited baseline data; absence of indicators; failure to monitor consistently; or simply that it is too early in the project cycle to assess the impact. A clear weakness of many schemes is that they are catalysed by external project funding, so the initiatives are not sustained beyond project completion unless funding can be found under the normal departmental budgetary allocation or the initiative becomes self-sustaining through revenue generation and/or continuing commitment of volunteer time.

However, the qualitative assessments of the TWCG project (Pantin *et al.* 2006) and the latest updates on the Jamaica LFMCS (CANARI 2006e) indicate that both have significantly raised community awareness of watershed issues, leading to some modification of behaviour. The LFMCS have also successfully lobbied to move from an advisory to a management role, a change that has been recommended in the drafting instructions for the new Forest Act.

Incentive regimes in the agricultural sector focus primarily on increasing production and promoting investment in the sector for agricultural competitiveness. Several

potentially perverse incentives were identified including tax and duty exemptions on the importation of agricultural chemicals, including persistent organic pollutants (POPs), chainsaws and vehicles. Also, as the incentives do not necessarily promote sustainable farming practices, successfully encouraging more farming could in itself contribute to the deterioration of watersheds (particularly increased soil erosion and pollutants in the water) at the same time as increasing the demand for water.

However, there is a growing awareness of the value of managing land and water resources for economic development, environmental sustainability and social well-being, particularly in Saint Lucia where a new and more flexible Agricultural Incentives Regime has just been introduced that specifically targets the contribution of agriculture to watershed management. In addition to a general incentive for technological innovations relating to the installation of soil and water conservation measures (for example drainage, vegetative controls, wastewater controls), the new regime also provides for special incentive measures related to sustainable land and water management. The design of the regime is sufficiently flexible to grant concessions on a case-by-case basis, with greater opportunity to emphasise watershed management issues (Thomas-Louis and Edwards 2006).

Several of the incentives identified were unsuitable for or excluded the poor and vulnerable (for example those based on exemptions from tax or requiring proof of land tenure). Potential beneficiaries also described many incentives as poorly promoted, complicated to access (for example difficulty in getting the requisite forms and complex processes for tax exemption) and insufficiently attractive in terms of the cost-benefit. They expressed a preference instead for indirect enabling incentives that would be more equitable and have a bigger impact on optimising watershed services and livelihoods. Access to land and regularisation of land tenure were the most frequently cited. Other suggestions included market development, credit facilities, capacity and skills development and research and development, although the survey results do not make it clear whether these preferences related just to improved productivity and market access or also to improved watershed services (Thomas-Louis and Edwards 2006).

Most implementing agencies reported that they monitor the schemes through mechanisms such as monthly reports from parish staff, surveys, participant database, field inspections, audits and other types of follow-up. However, the data collected did not allow a full evaluation of either the uptake or effectiveness of the incentives. As with the incentives piloted by the forestry departments, little attempt is made to capture the costs incurred by the state implementing agency under its routine budget (for example human resources, equipment, vehicles and their running costs) in the assessment of the efficiency of the incentives.

The project also briefly examined the potential of tourism certification schemes, such as Green Globe and Blue Flag, to catalyse greater involvement of the tourism sector in watershed management (for example as a 'buyer' of watershed services). Although such schemes explicitly encourage linkages with and support for upstream communities, the sector's interest in being certified is predominantly as a marketing tool. In fact, many hotels in the region seem content to display a notice claiming they are 'benchmarked' without ever progressing to full certification. Consequently, few expressed interest in doing more than the minimum mandated unless it could be shown to have benefits for the bottom line.

The project did not explicitly examine the provision of incentives to the tourism sector, but it is common practice for tourism developers to receive attractive tax holidays and duty exemptions, which few seemed to take into account when expressing the prevailing opinion that the tourism sector is already over-taxed. In general, the incentives examined met the criteria for a PWS scheme only in that they are voluntary transactions. None clearly defined the environmental service it sought to secure, although those from the forestry departments are premised on land uses presumed to secure improvements in the bundled services. The 'buyer' in all cases was a state agency, and many of them also acted as intermediaries. In the absence of a clear service, the role of 'seller' could not be said to exist although some of the recipients of the incentives could be described as watershed managers. Finally, no scheme incorporated conditionality, except in terms of the qualifications required to access the incentive.

### 3.3.3 Prerequisites for implementing PWS

In addition to the policy constraints, the project identified several further barriers to the implementation of PWS, both at the project sites and in Caribbean SIDS in general.

1. **Data gaps** in relation to establishing the most appropriate land use and valuing the services or bundled services it provides including:
  - absence of detailed information about the impact of different land-use systems on water and other environmental services, with traditional assumptions about beneficial land use remaining unquestioned;
  - lack of data at the appropriate level (for example data for a particular watershed may have to be extrapolated from data at a parish level) to provide a basis for the valuation of watershed services;
  - lack of consistent longitudinal data;
  - difficulty accessing government data (for example the data on water quality for the Talvern water catchment).



Land use and hydrology training workshop

In the absence of appropriate data, the two valuation studies had to rely in part on proxy data, such as quantitative estimates of the cost of flood damage in Buff Bay/Pencar, and on qualitative surveys of perceived impact in the case of the TWCG.

## 2. Skills gaps and human resource shortages

The main human resource constraint at the country and even the regional level is people with the skills to:

- conduct the necessary hydrological assessments;
- conduct the valuation studies;
- design, implement and monitor a PWS scheme.

In small islands, the pool of people with relevant technical expertise for watershed management is relatively small. With the accession to a range of multilateral agreements and external pressures to develop the accompanying national strategies and plans, there has been a proliferation of committees, often involving the same people. After considering the Jamaican NIWMC model, ALG participants from the smaller countries concluded that perhaps the most effective approach would be to develop a single multi-stakeholder, multi-sectoral committee to address a range of environmental issues rather than trying to sustain several.

### 3. Complex land tenure patterns

All the main study sites exemplified the complex land-tenure patterns that prevail in Caribbean SIDS, with a mix of:

- state ownership, sometimes with areas managed by more than one agency;
- private land ownership, often complicated by unresolved inheritance issues;
- informal settlement for housing and agriculture.

Informal settlement represents a major challenge for PWS, in part because most 'buyers' balk at entering into contractual negotiations with people without formal title to the land. Also, informal settlers are often those most in need of comprehensive poverty alleviation strategies that PWS cannot provide.

### 4. The cost of organising the sellers

In most of the project sites, the upper watershed managers were not organised into groups until catalysed by government or aid agencies (e.g. TWCG, Saint Lucia; HUDO, Dunn's River). In a PWS context, the cost of organising such groups before PWS is likely to be prohibitive given the scale of watershed benefits to potential downstream buyers. Even when the groups had been organised, concerns remained about whether all relevant stakeholders were represented (for example TWCG did not represent all the targeted farmers) and whether the collective interest in securing the watershed services was sustainable.

### 5. Scarcity of buyers, and particularly willing buyers

In the case of the Buff Bay/Pencar watershed, it proved difficult to identify a potential buyer as there were no obvious discrete beneficiaries of the watershed services. Because the value of enhanced services is likely to be greatest in terms of reduced flooding, one suggestion was that insurance companies should be approached. However, this was not pursued because the structure of the insurance industry means risk is borne at international rather than national level and much of the flooding is remediated under international aid programmes. In the Buff Bay/Pencar context, corporate social responsibility programmes, project funding and ongoing state assistance appear to be the only likely source of support for securing the watershed services.

In the case of Talvern and Fondes Amandes, water consumers in the downstream communities were identified as potential buyers, with a levy on water bills being a potential future mechanism. However, this could not be tested within the project timeframe and is unlikely to be practical or feasible in the short term as a result of:

- below-cost water pricing in both countries and resistance at many levels to introducing it;
- anticipated unwillingness to pay, particularly in countries where the perceived value of water is diminished by the high, and highly visible, rate of leakage from



- the system (50% of water in Trinidad is estimated to be unaccounted for);
- bureaucratic impediments to charging at local watershed level;
- insufficient evidence of the benefits of the TWCG on water flow and quality (Talvern).

In the Saint Vincent case study, the state-owned but semi-autonomous water and electricity companies have become the 'involuntary' buyers of ill-defined watershed services from LFUGs through the IFMDP. The IFMDP is administered by the Forestry Department, under a scheme implemented by Cabinet with little if any prior consultation. Nevertheless, both companies have expressed a theoretical willingness to pay, but remain as yet unconvinced in the absence of any cost-benefit analysis or valuation of the services secured or of the added value of the Forestry Department as an intermediary (John 2006; CANARI 2005a).

The study of the tourism sector as a potential 'buyer' of watershed services used Dunn's River and Speyside as the case-study sites. Results suggest that there is considerable potential for the tourism sector to improve its linkages with upper watershed managers to mutual benefit. However, there is resistance to formal payment schemes as the tourism industry perceives that it is already heavily taxed. Although this is open to dispute, it is clear that the cultivation of willingness to pay will require careful facilitation, including valuation of the services provided. Willingness to invest further is also likely to hinge on evidence that existing fiscal instruments are increasingly being used in ways that directly benefit the tourism industry, including improved watershed management. The project timeframe precluded such a lengthy process of facilitation (Leotaud 2006).

The water sector (narrowly defined in the context of the water sector study as those involved in water policy, legislation, tariffs, regulation, abstraction, extraction, distribution and enforcement) is also a potential 'buyer' of watershed services. However, the study noted several prerequisites for moving towards a more market-based approach, most of which are unlikely to be achieved in the short term:

- creation of an enabling environment for rationalisation and consensus building among water users at the national and local level;
- resolution of the policy conflicts between water as an economic and a social good;
- acceptance by policy makers and water managers that payments or incentives might play a more effective role in achieving development and watershed protection objectives than subsidised water, particularly in the agriculture sector (Springer 2005a).

## 6. Transaction costs

The watersheds at the project sites ranged from about 320 to 20,200 hectares with relatively sparse populations in the upper watershed, which is typical of the

micro- and small watersheds found in the project countries. Although this reduces the number of potential sellers, it does not necessarily reduce the complexity of engaging them in payment or incentive schemes. Informal settlements are common in the mid- to upper watersheds, with few, if any, organised groupings to whom payments could be made. State agencies are often the only organisations with the capacity to act as intermediaries. So although no payment schemes were tested, it is clear that in most instances the transaction costs are likely to be high relative to the small scale of the watersheds and the value of the services secured (and the small scale of the downstream buyers of such services).

### **3.3.4 Insights from community-based management of watershed resources**

The projects at the two case-study sites may seem to have few similarities. The FACRP in Trinidad dates back to the 1980s and is an initiative catalysed by a community of informal settlers who were motivated both by a shared Rastafarian philosophy and the need to prevent forest fires from damaging their homes and crops. The IFMDP in Saint Vincent, on the other hand, was created by Cabinet decision in 2003 and motivated by the dual objectives of rehabilitating degraded watersheds and providing livelihoods for the rural poor, and particularly alternative livelihoods for former growers of marijuana. Nevertheless, both currently benefit from the credibility of government recognition and endorsement of activities taking place on state land, albeit limited in the case of the FACRP, and this has served as a basis for attracting other donors and supporters.

In other respects, the Trinidad FACRP case study challenges the assumptions that underlie PWS schemes and existing incentive regimes. Firstly, it is an example of people without land tenure investing in sustainable land management practices. These have demonstrably contributed to improved watershed services (principally water flow and quality but also biodiversity and landscape beauty) even though external incentives have been limited and compensation has been sporadic and inequitable. Secondly, it is an informal and ostensibly insecure arrangement between community-level watershed managers and their beneficiaries. Although FACRP members would prefer to have their tenure regularised, they feel relatively secure as a result of the level of government and donor support and recognition. FACRP members' continuing willingness to enhance the watershed services is not based on an economic quantification of the values but on a perception that the benefits outweigh the costs. They recognise that if calculated in purely monetary terms this might not be the case but the rationale for undertaking the project is complex and includes many less tangible motivating factors such as religious beliefs, a commitment to community cohesion and the provision of direct livelihood benefits to community members.

The Saint Vincent IFMDP is a relatively new initiative so its impact cannot yet fully be assessed. However, it is another example of a scheme that is not based purely on economic incentives because the IFMDP cannot compete in monetary terms with the income that can be generated from growing marijuana. Instead it capitalises on the desire of some marijuana growers, and particularly the older ones, to transfer to legal livelihood activities. An innovative aspect of the IFMDP is the employment by the Forestry Department of a well-known former grower of marijuana and advocate of the need to provide alternative livelihood options as the intermediary between itself and the LFUGs. Although this may have contributed to initial buy-in at local level, both the LFUGs and the utility companies expressed frustration at being excluded from the initial design of the project and, in the case of the LFUGs, from direct involvement in the committee overseeing project implementation.

Ultimately, the success of the IFMDP, like the FACRP, is likely to depend on whether the watershed managers and the current and potential 'buyers' continue to perceive that the benefits of their involvement outweigh the costs. Although hydrological and valuation studies would be useful, the most critical gap seems to be the collection of baseline data on livelihoods and the status of the resource as a basis for evaluating the success of the project and, by extension, the ability to attract new buyers or investors.

### **3.3.5 The contribution of the action-learning approach to regional understanding of the potential for and alternatives to PWS**

The five project countries share many common watershed management issues but proved to have differing capacity and diverse policy, legal and institutional frameworks. This added to cross-learning between countries but also compounded the complexity of regional analysis and conclusions. For example, some of the institutional models being tried in Jamaica, which initially seemed of interest to the other countries, were determined to be less appropriate for a different geographic scale or political systems with weaker local governance. Specifically, whereas ALG members initially saw Jamaica's NIWMC as a potential model for integrated watershed management in their own countries, further analysis of the NIWMC structure and capacity, combined with the study tour of institutional arrangements for PES in Costa Rica, significantly refined their perception of what would be most effective in their national contexts.

Participants in the Costa Rica study tour identified the following as the main institutional factors which facilitate PWS in that country:

- strong public awareness of the value of environmental services, sustained over time and enshrined in the school curriculum;
- the critical role of a strong semi-autonomous public institution (The National Forestry Financing Fund – FONAFIFO), with a legal mandate, to lead the process;
- the involvement of strong NGOs with a high level of relevant skills;



Members of local forest user groups at panel discussion

- the integration of economic, social and environmental objectives;
- the culture of collaboration, participation and transparency across competing sectors;
- outcome-driven practice, not locked into a payment system but adaptive enough to respond to changing internal and external circumstances;
- the development of a cadre of professionals (foresters) to meet the national demand under PWS.

Additional lessons of relevance to Caribbean SIDS were identified as:

- land acquisition is not a necessary prerequisite for watershed protection;
- projects need to be monitored and evaluated through active measuring of net impacts to assess opportunity cost of reforestation/agro-forestry versus other pursuits;
- the effectiveness of demonstration projects in building public awareness and consciousness about the integration/interplay of social, economic and environmental benefits;
- conservation objectives can be achieved through economic incentive schemes appropriately tailored;
- the success of PWS rests on a combination of education, legislation, implementation and contingency/enforcement.

It was noted, however, that there are significant differences in the historical, social and political factors that have shaped the Costa Rican institutional landscape, such

as the continuing encouragement of a rural agrarian economy and the much higher private land ownership than has resulted from the plantation economies of Caribbean SIDS.

The ALGs at the national level in Jamaica and Saint Lucia proved to be a useful mechanism for bringing together different and often differing stakeholder perspectives, refining the characterisation of the watershed management challenges and consequently the potential or otherwise for market-based solutions. For example, in Saint Lucia it rapidly became clear that a key stakeholder and potential buyer of services, the Water and Sewerage Company (WASCo), remained unconvinced of the impact of the TWCG's activities on water quantity and quality. Moreover, WASCo is now investing in infrastructure to provide Castries with water from the Roseau Dam rather than in incentives to support community-based watershed management by the TWCG. In Jamaica, the ALG member of the Coffee Board rapidly disabused the project team of its perception that Blue Mountain coffee growers would not shift to shade-grown coffee because there were insufficient economic incentives. Instead, he indicated that there is already an adequate premium attached to shade-grown coffee but clear-cutting continues because it is the only identified way of preventing American leaf spot fungus. Nevertheless, there are significant land-use management practices that could be implemented to reduce soil erosion and chemical contamination of the watercourses.

Adaptive learning in the face of new challenges and issues was a feature of the project implementation at regional, national and project management levels. For example, in both main pilot sites some of the preconditions for a market-based scheme proved to be absent (e.g. identification of a willing buyer and preconditions for conditionality such as the availability of data to demonstrate effectiveness of interventions, systematic monitoring and evaluation). Similarly, the initial scoping of the potential of tourism certification schemes to stimulate or promote market-based mechanisms concluded that the potential was limited within the project period. However, these findings were then usefully applied in the design and selection of subsequent research activities such as the two tourism sector case studies and the case study of the IFMDP in Saint Vincent.

The sector forums also contributed significantly to the regional action-learning process, with new members being added to the ALG team after each of the first two (tourism and water). The tourism sector forum provided a basis for the design of the subsequent tourism case studies whereas the water and agriculture sector forums were based around reports commissioned as a result of ALG discussions (Springer 2006a,b; Thomas-Louis and Edwards 2006). The addition of new policy and decision makers, from both government and the private sector, for the study tour to Costa Rica brought new perspectives and further enriched the learning process.

## 4 Lessons learned, ways forward and conclusions

### 4.1 Lessons learned

The project provided valuable lessons both about the process of action learning and about the scope for PWS and/or alternative approaches to enhance the provision of watershed services and contribute to livelihoods in Caribbean SIDS:

**1. The project contributed significantly to regional understanding of the prerequisites for selecting PWS sites with prospects of success for both the services and livelihoods.** The following emerged as the key questions that should underpin the selection and prioritisation of PWS sites. The accompanying comments highlight relevant project lessons or examples that contributed to the overall conclusion that the scope for PWS in the region is currently limited.

- *Are watersheds clearly delimited, with local representation linked to those watershed boundaries?* In most cases watersheds are clearly delimited on maps but the boundaries may not be well understood on the ground, hence the value of participatory mapping. In many cases local representation, if it exists at all, is through organisations whose mandates are not based on watershed boundaries and it is therefore difficult to incentivise change evenly across an entire watershed.
- *Is information available to identify which watersheds are most threatened by poor land use?* Most countries have a good sense of this and there have been some formal assessments, such as the one that catalysed the Water Catchment Groups in Saint Lucia.
- *Are damaging forms of land use amenable to change through a payment?* The case of the Blue Mountain coffee growers demonstrates that this is not always the case.
- *In the threatened watersheds, are there significant concerned downstream beneficiaries?* None of the initiatives at project sites were catalysed by concern from downstream users. Most downstream beneficiaries have weak linkages with the upstream communities and tend to characterise problems arising from watershed deterioration as ‘the government’s responsibility’.
- *Is the beneficiaries’ level of concern sufficient to constitute willingness to pay?* No willingness to pay surveys have been conducted but might usefully serve to raise beneficiary awareness of the value of the services they receive (for example from the FACRP or TWCG) even if they do not ultimately result in PWS schemes as a result of the constraints noted earlier.
- *Is the payment they would be prepared to make sufficient to incentivise a change of land use upstream?* A clear problem with several of the incentive schemes examined was that uptake was low because those targeted found

the net gain too low. Piloting schemes on a small scale before rolling them out nationally might help to avoid this and identify unnecessary and expensive bureaucratic hurdles.

- *Is there sufficient certainty about the impacts of the land-use change on watershed services to make the payment conditional on specific outcomes? And is there data to support the baseline on which the conditionality will be based and will it continue to be collected consistently?* Little research is being done on hydrological relationships and most current reforestation schemes are based just on the general assumption that more trees will improve watershed services in a broad sense, with no disaggregation of the particular service and no quantification of the expected outcomes, except perhaps in terms of tree survival over a particular period. Recent studies show that the impact of forests on some watershed services (for example dry season flows) is likely to be negative but the ALG could not identify any work in this area in the Caribbean. Incentives for more sustainable agricultural practices could theoretically be tied in with water-quality data and monitoring of the demand for water for irrigation. However, the complexity of the land-use patterns even in small watersheds and the paucity of reliable longitudinal data present a major constraint in answering these questions.
- *Are the potential 'sellers' organised enough to receive payments and/or is there an intermediary that can catalyse this?* With the exception of Fondes Amandes, all the groups had been catalysed by government agencies, albeit in some instances (such as Saint Vincent) using existing communities of interest as a basis.
- *Can payments be designed that prioritise returns to the poor and marginalised?* Although many of the older incentive regimes effectively excluded those who don't legally own land or pay taxes, some of the more recent schemes not only include but specifically target informal settlers and farmers. However, promotion and delivery of such incentives or payments needs to be carefully designed as the potential recipients may be wary of interactions with government agencies. PWS as defined above (Wunder 2005) are less likely to offer the flexibility needed in these more complicated contexts.
- *If all other conditions can be met, is there sufficient political will and institutional capacity to catalyse a payment scheme?* This varies from country to country but political will is to some extent manifested by the interest shown in examining alternatives to current approaches as well as the plethora of existing initiative targeting rural development and poverty reduction. The challenge is to develop a coherent and integrated institutional framework that can capitalise on the limited human capacity and leverage the existing financing.

**2. PWS is no substitute for effective poverty reduction strategies.** Although this has not yet been proven in the regional context, this was clearly articulated by stakeholders in the Costa Rican context, where PWS have been in existence for many years. None of the ‘sellers’ encountered during the Costa Rica study tour received sufficiently high payments to consider this their sole or even their main source of income.

**3. PWS is no substitute for effective land-use planning.** In the absence of coherent and effectively enforced land-use planning, PWS schemes are likely to be at best small plasters on a deteriorating wound. They will not address some of the major identified sources of watershed degradation in the Caribbean, such as housing, tourism and other industrial development and the associated infrastructure. Some concern was expressed that schemes targeting small farmers are being used as convenient smokescreens to mask the equally or more damaging activities of the rich and powerful without addressing land tenure security issues that continue to be a barrier to more secure livelihoods for the poor.

**4. Key elements of an effective integrated institutional structure** for watershed management are a legal basis for power, clear authority and the ability to devolve power and authority to well-funded and technically competent local institutions. Such institutions are rare in Caribbean SIDS. Similarly, a key element of an **effective institutional process** is the flow of information up and down.

**5.** Although countries in the region may not be ready or willing to adopt PWS, some of the **tools and methods** associated with it can be useful in the broader context of determining what is the most effective approach to watershed management in a specific context. In particular:

- **valuation of watershed services** are a useful communication tool that can contribute to increased stakeholder awareness of the costs of and benefits from effective watershed management. Valuation studies provide a sound basis for the negotiations between different interests by highlighting the nature of and value attached to potential trade-offs;
- **hydrological analysis** provides managers with a sound basis for planning and decision making. In its absence decisions about land use and/or remedial actions may be ill-founded;
- establishing from the outset the **objectives, baselines, indicators and monitoring procedures** is useful in determining the efficiency and effectiveness of any watershed management intervention. This should ideally be established through a participatory process involving all key stakeholders as lack of consensus can derail an intervention. For example, although the qualitative assessment of the TWCG’s activities suggests a positive impact on the behaviours contributing to watershed degradation (Pantin *et al.* 2006), this was insufficient



to secure the buy-in of WASCo in the face of highly visible evidence of ongoing siltation. On the other hand, the Fondes Amandes case study suggests that clear evidence of an improvement in watershed services (for example water quality and flow) may provide the basis for developing a relationship with government agencies which secures additional resources and support for existing watershed management initiatives.

**6. The water, tourism and agricultural sectors** offer the greatest potential to become 'buyers' for enhanced watershed services, but in most instances consider themselves over-taxed or contributing adequately already. Progress towards PWS would need to be underpinned by valuation of sectoral contributions to and benefits from watershed services and an assessment of the efficacy and equity of existing tax regimes. Scope exists to enhance the contribution of such sectors primarily by:

- involving them in integrated watershed planning;
- increasing their linkages with and support for community-based managers;
- developing sectoral policies that reflect the importance of watershed services (as is the case with the new agricultural incentives regime in Saint Lucia);
- developing appropriate and attractive incentives; and
- removing perverse incentives or subsidies (for example those that encourage the use of pesticides).

**7. Keys to success in relation to community-based watershed management initiatives** include:

- a clear **vision or philosophy** on which there is consensus from the implementing group and/or community members;
- **government recognition and endorsement**, even if it is limited and informal;
- provision by government of **an enabling environment for participatory approaches** to watershed management, particularly in cases where the land is state owned;
- sufficient **financial and technical support** to sustain the initiative on a fairly continuous basis, transcending donor project cycles and changes in group leadership;
- **provision of direct livelihood benefits** to members of the group and to the wider community, though this need not always be monetary, with recognition of the value of the community's activities and building of capacity and linkages also rated highly. In fact, some members of the TWCG even identified the introduction of monetary rewards as a disruptive influence on previously harmonious volunteer efforts;
- **building on existing effective community institutions** rather than seeking to impose a particular type of governance structure. In Fondes Amandes, for example, the project was steered and held together over many years by the strong and proactive leadership of a single individual, whereas comparable initiatives with more conventional governance structures such as the TWCG foundered;

- **willingness to continue investing depends on stakeholders' perception of the value of the services provided or received.** Whether or not this is formally quantified, they must perceive that the gains outweigh the losses.

**8. Direct benefits are not the only motivation for 'buyers'.** For example, many of the incentives and rewards identified in the case of Fondes Amandes, Trinidad, came not from direct beneficiaries but from organisations and agencies with no direct stake in the protection of the watershed. Similarly, in Jamaica, the tobacco company Carreras funded reforestation projects under its corporate social responsibility programme, not because it was a direct beneficiary of the watershed services. In Saint Lucia, some of the funding for the TWCG was secured under an EU Stabex programme designed to alleviate poverty following the decline in the banana industry.

- 9. The action-learning process** could have been further enhanced by:
- incorporating a wider cross-sectoral perspective at the project design stage;
  - inclusion of updates by ALG members at each ALG meeting on policy, institutional and other changes in their countries and sectors;
  - more systematic identification of opportunities for ALG members to disseminate project learning in their countries and sectors;
  - inclusion in the group of someone working in the area of poverty reduction and a relatively senior person from the Ministry of Finance.

CANARI proposes to adopt the ALG format and some of the current membership for a Forests and Livelihoods ALG to oversee the implementation of two regional projects it is implementing: one under the Food and Agriculture Organization of the United Nations National Forest Programme Facility; and the other under the European Commission's Programme on Tropical Forests and other Forests in Developing Countries.

## 4.2 Ways forward

### 4.2.1 Application of project learning into policy formulation and project design and implementation

There are several regional projects that offer scope for this, including:

- IWCAM, implemented by CEHI;
- FAO National Forest Policy Facility regional project, implemented by CANARI, which specifically seeks to catalyse and source support for reviews of forest policies in the seven project countries;
- United Nations Convention to Combat Desertification (UNCCD) regional activities under the *Partnership Initiative on Land Degradation and Sustainable Land Management* and the *GEF/UNDP LDC and SIDS Targeted Portfolio Approach* for

*Capacity Development and Mainstreaming of Sustainable Land Management*, as well as the proposed GEF-funded Sustainable Land Management project, all executed through CEHI.

#### **4.2.2 Future research agenda**

CANARI and its research partners identified the following as research projects that could further advance the goal of understanding the nature of and building regional capacity for effective watershed management that maintains or enhances services and supports livelihoods, particularly those of the rural poor:

1. Further research on the potential role of the tourism sector in supporting effective watershed management as recommended in Leotaud (2006).
2. Further analysis and dissemination of case studies demonstrating effective watershed management, whether based on PWS or other innovative approaches, using network analysis and drawing on complex systems theory.
3. Research on the institutional and/or capacity gaps in and provision of technical assistance and training to the following project sites or institutions (some of which were included in this project and some of which are new):
  - Fondes Amandes, Trinidad;
  - the national and local institutions for watershed management in Jamaica;
  - IFMDP, Saint Vincent;
  - NRWPR in Trinidad and Tobago, with a particular focus on northeast Trinidad;
  - Apres Toute Water Project, Grenada;
  - Fond D'Or (IWCAM site), Saint Lucia;
  - Centre Hills, Montserrat.
4. Analysis of the actual and potential contribution of corporate social responsibility programmes to watershed management and livelihoods. Examples that might be studied include:
  - Carreras and Alcoa (Jamaica);
  - Sandals (headquartered in Jamaica with resorts in several islands);
  - BHP Billiton and BP Trinidad and Tobago (Trinidad and Tobago).
5. Regional and/or national capacity-building programme, for example:
  - participatory strategic visioning and planning;
  - technical assistance for legislative policy review and development processes;
  - small grants to catalyse experimental approaches at the local level (for example LFMCS, LFUGs);
  - designing and conducting willingness to pay surveys.

### 4.3 Policy recommendations

The overriding policy recommendation that emerged for the use of PWS is that it should be considered as just one potential tool in the watershed management toolbox and not as a panacea for the failures of other approaches. Based on the questions identified in section 4.1(1), the scope for PWS in the region is likely to remain limited in the foreseeable future to exceptional cases in a few watersheds. Instead, lessons from this examination of the role of PWS could usefully be incorporated in reshaping and re-testing existing local management initiatives, incentive regimes and the enabling institutional framework.

There is considerable scope for defining clearer objectives for initiatives designed to enhance watershed services and situating them within overall national development goals. There is also a need to develop consensus on the indicators of success that can be realistically attributed to the intervention, and establishing how, when and by whom these will be monitored. In isolation, incentives whose primary target is to alter behaviours or land use are unlikely to provide the most effective vehicle for equitable rural livelihoods; however, care should always be taken to avoid them having a detrimental effect on the poor and vulnerable, with a greater focus on enabling incentives.

The use of valuation and hydrological studies as a basis for decision making and raising public awareness of the value of watershed services should be encouraged where feasible. As it is unlikely to be possible to build sufficient capacity to conduct such studies in every country, a regional pool of expertise could be built, which would also enhance the potential for intra-regional cross-learning.

For the wider issue of enhancing watershed services and the livelihoods of poor people, several other key policy recommendations emerged:

- development at the national level of an integrated planning framework and the institutions to support it;
- development of policies in a participatory manner to assure a national consensus on objectives, methodology and impact;
- enhancement of the role and contribution of key sectors that benefit (often disproportionately) from watershed services (for example tourism, agriculture, utilities and energy industry);
- enhancement of the mechanisms for intra-country communication and exchange of technical capacity (for example CARICOM, Environment and Sustainable Development Unit of the Organisation of Eastern Caribbean States – OECS-ESDU, CANARI, CEHI) and to institutionalise and strengthen the coordination and collaboration of such institutions with national NGOs, quasi-government agencies and partners.

## References

- Bass, Steve and Geoghegan, Tighe (2002) *Incentives for watershed management in Jamaica: results of a brief diagnostic*. CANARI Technical Report No. 314, CANARI, Laventille.
- CANARI (2002) *Who Pays for Water? Preparing for the use of market-based mechanisms to improve the contribution of watershed services to livelihoods in the Caribbean: Phase II Project Proposal*. Internal document, CANARI, Laventille.
- CANARI (2004a) *Report of the First Meeting of the Regional Action Learning Group on Markets for Watershed Services and Improved Livelihoods*. Internal document, CANARI, Laventille.
- CANARI (2004b) *Report of the Second Meeting of the Regional Action Learning Group on Markets for Watershed Services and Improved Livelihoods*. Internal document, CANARI, Laventille.
- CANARI (2004c) *Report of Tourism Sector Forum, Castries, Saint Lucia, December 2004*. Internal document, CANARI, Laventille.
- CANARI (2004d) *Markets for Watershed Protection Services: Challenges and Opportunities*. CANARI Policy Brief No. 4: 4pp.
- CANARI (2005a) *Report of the Third Meeting of the Regional Action Learning Group on Markets for Watershed Services and Improved Livelihoods*. Internal document, CANARI, Laventille.
- CANARI (2005b) *Report on the Training Workshop Tools for Effective Watershed Management: Land Use and Hydrology Assessment and Participatory Resource Mapping*. Internal document, CANARI, Laventille.
- CANARI (2005c) *Report on the Training Workshop Economic Valuation for Watershed Management*. Internal document, CANARI, Laventille.
- CANARI (2006a) *Report of the Fourth Meeting of the Regional Action Learning Group on Markets for Watershed Services and Improved Livelihoods*. Internal document, CANARI, Laventille.

CANARI (2006b) *Report of the Fifth Meeting of the Regional Action learning Group on Markets for Watershed Services and Improved Livelihoods*. Internal document, CANARI, Laventille.

CANARI (2006c) *Final report on Jamaica Action Learning Project, Who Pays for Water Project*. Document No.10, CANARI, Laventille.

CANARI (2006d) *Report on a study to evaluate existing incentives in the Buff Bay/ Pencar Watershed, Jamaica*. Internal document, CANARI, Laventille.

CANARI (2006e) *Final report on Saint Lucia Action Learning Project, Who Pays for Water*. Project Document No.10, CANARI, Laventille.

CANARI (2006f) *Report of Water Sector Forum, Kingston, Jamaica, January 2006*. Internal document, CANARI, Laventille.

CANARI (2006g) *Report of Agriculture Sector Forum*. Internal document, CANARI, Laventille.

CANARI (2006h) *Report on Caribbean study visit to Costa Rica to examine institutional arrangements for Markets for Environmental Services*. Internal document, CANARI, Laventille.

Cox, Christopher (2004) *A Hydrological Assessment and Watershed Management Plan for the Talvan Water Catchment*. Who Pays for Water Project Document No. 1, CANARI, Laventille.

Geoghegan, Tighe (2002) *Incentives for Watershed Management in Saint Lucia: Results of a brief diagnostic*. CANARI Technical Report No. 317.

John, Lyndon (2006) *From Growing Ganja to Planting Trees: Stimulating legal livelihoods and watershed management in Saint Vincent through payments from public utilities*. Who Pays for Water Project Document No. 4. CANARI, Laventille.

Krishnarayan, Vijay (2002) *Incentives for Watershed Management in Grenada: Results of a brief diagnostic*. CANARI Technical Report No. 315.

Krishnarayan, Vijay and Pantin, Dennis (2002) *Incentives for watershed management in Trinidad: results of a brief diagnostic*. CANARI Technical Report No. 316.

- Landell-Mills, Natasha and Porras, Ina (2002) *Silver Bullet or Fools Gold? A global review of markets for forest environmental services and their impact on the poor*. IIED, London.
- Leotaud, Nicole (2006) *Linking tourism to watersheds and people: a preliminary analysis of the potential of the tourism sector to contribute to payments for watershed services in Dunns River, Ocho Rios, Jamaica and Speyside, Tobago*. Who Pays for Water Project Document No. 3, CANARI, Laventille.
- Lum Lock, Alana and Geoghegan, Tighe (2006) *Rewarding community efforts to protect watersheds: Case study of Fondes Amandes, St Anns, Trinidad and Tobago*. Who Pays for Water Project Document No. 12, CANARI, Laventille.
- Murray, R. (2003) 'The nexus between rainfall and land degradation: the Vincentian experience'. Paper presented at the St Vincent and the Grenadines Country Conference, 22–24 May 2003. University of the West Indies, Cave Hill.
- Pantin, Dennis and Reid, Veronica (2005) *Economic Valuation Study: action learning project on incentives for the Buff Bay/Pencar Watershed*. Who Pays for Water Project Document No. 2, CANARI Laventille.
- Pantin Dennis, Reid, Veronica and Neranda, Maurice (2006) *Valuation of the Contribution of the Talvern Water Catchment Group, Saint Lucia to Watershed Management*. Who Pays for Water Project Document No. 8, CANARI, Laventille.
- Pantin, Dennis and Ram, Justin (2006) *Economic Valuation of Watershed Goods and Services: Guidelines for the Caribbean*. Who Pays for Water Project Document No. 13, CANARI, Laventille.
- Smith, Allan (2006) *Participatory mapping guidelines*. Who Pays for Water Project Document No. 14, CANARI, Laventille.
- Springer, Cletus (2004a) *Cost Pricing for Water Production and Water Protection Services in Saint Lucia: A situational analysis*. Who Pays for Water Project Document No. 6, CANARI, Laventille.
- Springer, Cletus (2004b) *Cost Pricing for Water Production and Water Protection Services in Jamaica: A situational analysis*. Who Pays for Water Project Document No. 7, CANARI, Laventille.

Springer, Cletus (2004c) *Executive Summary of Cost Pricing for Water Production and Water Protection Services in Jamaica and Saint Lucia: A situational analysis*. Who Pays for Water Project Document No. 5, CANARI, Laventille.

Thomas-Louisy, Louvette and Edwards, Thera (2006) *Linking agriculture to watersheds and people: Analysis of the potential of agricultural incentives to contribute to payments for watershed services in Saint Lucia and Jamaica*. Who Pays for Water Project Document No. 9, CANARI, Laventille. Report on training workshop: Economic Valuation for Watershed Management.

Williams A.N. (2003) *St. Vincent & the Grenadines: Country experience in land issues*. Land Tenure Centre, University of Wisconsin-Madison.

Wunder, Sven (2005). *Payments for environmental services: some nuts and bolts*. Occasional Paper No. 42. Centre for International Forestry Research. Indonesia.



## Annex 1: Members of the Regional Action Learning Group<sup>8</sup>

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8. Members who took part in at least two of the five meetings

The reliability of water supply in the Caribbean varies between islands, but it is consistently the poor who receive the worst service. The problem is compounded by widespread soil erosion throughout the Caribbean, which has major impacts on the quality of water supply and watershed fertility.

This report describes an action-learning project led by the Caribbean Natural Resources Institute (CANARI) that strengthened the capacity of national and regional institutions to assess the potential of economic instruments to improve the quality and delivery of watershed services in the Caribbean. It focuses on project sites and case studies in Jamaica, Saint Lucia, Grenada, Trinidad and Tobago, and Saint Vincent and the Grenadines, while drawing lessons of wider regional and international interest.

This study was funded by the UK Department for International Development (DFID) as part of a multi-country project coordinated by the International Institute for Environment and Development (IIED) on Developing Markets for Watershed Services and Improved Livelihoods. The views expressed in this study do not necessarily represent those of the institutions involved, nor do they necessarily represent official UK Government and/or DFID policies.



**IIED Natural Resource Issues No. 8**

ISBN: 978-1-84369-652-0  
ISSN: 1605-1017