

---

# Water, watersheds, forests and poverty reduction: a Caribbean perspective



Lyndon John and Daniel Firth  
December 2005



International  
Institute for  
Environment and  
Development



**DFID** Department for  
International  
Development

---

The views represented in this document do not necessarily represent those of the institutions involved, nor do they necessarily represent official UK Government and/or DFID policies.

**Contacts:**

Lyndon John • Caribbean Natural Resources Institute (CANARI) • Tel: +868 626 6062 •  
Fax: +868 626 1788 • Email: Lyndon@canari.org • Email: info@canari.org • Website:  
www.canari.org.

Daniel Firth • Dan.Firth@brent.gov.uk

Forestry and Land Use, Natural Resources Group, International Institute for Environment  
and Development, 3 Endsleigh Street, London WC1H 0DD, UK • Tel: +44 (0)20 7388 2117 •  
Fax: +44 (0)20 7388 2826 • Email: ivan.bond@iied.org

**Citation:**

Lyndon, J. and D. Firth (2005) 'Water, watersheds, forests and poverty reduction: a  
Caribbean perspective'. Paper originally presented at the Seventeenth Commonwealth  
Forestry Conference, Kuala Lumpur, 28<sup>th</sup> February – 5<sup>th</sup> March, 2005. The Caribbean  
Natural Resources Institute (CANARI), Laventille, Trinidad and Tobago and International  
Institute for Environment and Development, London, UK.

(This paper was originally published in the 'Proceedings' of the Seventeenth Commonwealth  
Forestry Conference by the Forestry Commission on behalf of the Standing Committee on  
Commonwealth Forestry.)

**Developing markets for watershed protection services and improved livelihoods**

Based on evidence from a range of field sites the IIED project, 'Developing markets for  
watershed services and improved livelihoods' is generating debate on the potential role of  
markets for watershed services. Under this subset of markets for environmental services,  
downstream users of water compensate upstream land managers for activities that influence  
the quantity and quality of downstream water. The project purpose is to increase  
understanding of the potential role of market mechanisms in promoting the provision of  
watershed services for improving livelihoods in developing countries.

The project is funded by the UK Department for International Development (DFID).

## Table of contents

Acronyms and abbreviations .....	4
Executive summary .....	5
1. Introduction.....	6
1.1 Sustainable development and watersheds in the Caribbean.....	6
2. Watersheds and poverty linkages in the Caribbean.....	9
2.1 Access to water by the rural poor .....	10
3. Poverty in the Caribbean.....	12
3.1 Indices of poverty in the Caribbean .....	12
3.2 Regional poverty reduction strategies .....	13
4. Integrated approaches to planning in watershed management.....	15
5. Participatory forest management in the Caribbean .....	16
5.1 Grenada's National Forest Policy .....	16
5.2 Jamaica's local forest management committees (LFMC) .....	17
5.3 St. Lucia: Talvern Water Catchment Group.....	17
5.4 Trinidad and Tobago: The Fondes Amandes Community Reforestation Project .....	17
6. Conclusions.....	19
References .....	20

## Acronyms and abbreviations

BERU	Banana Emergency Recovery Unit
BPOA	Barbados Programme of Action (for the Sustainable Development of Small Island Developing States)
CANARI	Caribbean Natural Resources Institute
CARICOM	Caribbean Community and Common Market
CBOs	Community-based organisations
CDB	Caribbean Development Bank
CEHI	Caribbean Environmental Health Institute
CIDA	Canadian International Development Agency
CPA	Country Poverty Assessment
DFID	Department for International Development
ECCB	Eastern Caribbean Central Bank
FAO	The UN Food and Agriculture Organization
FGT P2	Foster-Greer-Thorbecke (A measure of the severity of poverty)
GDP	Gross domestic product
HIV-AIDS	Human immunodeficiency virus-Acquired Immune Deficiency Syndrome
IDB	Inter-American Development Bank
IIED	International Institute for Environment and Development
IWCAM	Integrated Watershed and Coastal Area Management
IWRM	Integrated water resources management
LFMC	Local forest management committees (Jamaica)
MDGs	Millennium Development Goals
NSDS	National sustainable development strategies
NGO	Non-governmental organisation
NRSP	Natural Resources Systems Programme (DFID)
NTFPs	Non-timber forest products
OECS-NRMU	Organisation of Economic States-Natural Resources Management Unit
PFM	Participatory forest management
PRSP	Poverty Reduction Strategy Papers
PRs	Poverty reduction strategies
SIDS	Small Island Developing States
TWCG	Talvern Water Catchment Group
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WSSD	World Summit for Sustainable Development

## **Executive summary**

Small Island Developing States like the Caribbean islands face a challenge in securing watersheds and freshwater to service competing water demands from various economic sectors. Processes of prioritisation for access to water often lack equity, represent the interests of industrial demands, and marginalise interests and water needs of the poor. Regional Poverty Reduction Strategy Papers (PRSPs) are based on traditional economic indicators and give scant attention to the poverty and forest resource nexus and therefore inadequately reflect the actual and potential role of forest resources in alleviating rural poverty. Poverty related issues were once perceived as solely the domain of government ministries responsible for social affairs. However, there has been a shift and many sectors, including the forests and watershed management sector, now strive to incorporate poverty reduction elements in policy formulation. The challenge remains one of coordinating strategies under various portfolios for poverty reduction while ensuring access to water and forest resources by the poor.

## 1. Introduction

Forest resource management and the attending issues of watersheds and water resource management are complex in the Caribbean. The importance of watersheds is recognized by governments in most islands as many rely on overland flows of streams and rivers to meet freshwater needs. However, freshwater resources are threatened by deforestation and inappropriate land use practices across the region. The resulting landslides in turn negatively impact on the livelihoods of the rural poor due to the loss of crops and their being cut off from markets. Therefore, forests have a direct relationship with the rural poor of the Caribbean in terms of providing water and a means of livelihood. Poverty assessments conducted to date reveal that the rural poor outnumber their urban counterparts in the Caribbean (Government of Grenada 2003; Government of Dominica 2003 DFID 2001; Government of St. Lucia 2003). Such poverty assessments, however, tend to be based on an economic analysis derived from the World Bank's estimate of an extreme poverty indicator of \$US1 per day. This methodology is limited in its scope and tends to assume that livelihoods are tied to market based arrangements, whereas in the Caribbean, access to natural resource capital that helps address some needs. The regional challenge can be summarised as: the need to assess the actual and potential contribution of forests in the Caribbean towards poverty alleviation; the need for intersectoral planning arrangements; and the need for development of governance arrangements that accommodate the participation of rural poor stakeholders. There are emerging regional examples that involve public sector, community based organizations and non governmental organizations that are indicative of possible approaches that offer meaningful roles for stakeholder participation and livelihood prospects.

This paper draws on the experience of the Caribbean Natural Resources Institute (CANARI) and its applied research on the insular region of the Caribbean. Firstly, the paper will explore the Caribbean's commitment to sustainable development and the significance of watersheds, water and the critical role these resources play in tackling poverty. It will then present a synopsis of the results from some of the poverty assessments conducted in the region and examine the nexus between poverty and forest/watershed management. Thirdly, it will examine recent efforts at policy research and policy formulation to address the growing demands for forest services, including the provision of water, while addressing poverty reduction goals.

### 1.1 Sustainable development and watersheds in the Caribbean

Small Island Developing States (SIDS) of the Caribbean, like SIDS the world over, are limited in geographical space and natural resources. This gives rise to the special needs and circumstances of SIDS which have been highlighted for international attention in the Barbados Programme of Action for the Sustainable Development of Small Island Developing States (BPOA) and its successor, the Mauritius Plan of Action, that has emerged out of the recently concluded SIDS BPOA+10 Summit in Mauritius. SIDS development issues were also considered under the World Summit for Sustainable Development's Johannesburg Plan of Implementation (WSSD). The Caribbean Community has also taken on the challenge of the Millennium Development Goals that emerged out of the United Nations Millennium Summit of September 2001. Notable goals include Goal 1 which is to "eradicate extreme poverty and hunger" and Goal 7 in which Target 10 is to halve by 2015, the proportion without sustainable access to safe drinking water and basic sanitation. The Caribbean has been the first to produce a regional report regarding its status on the various MDG targets which is expected to serve as a systematic form of establishing benchmarks and tracking progress (UNDP 2004).

Regional environmental policy statements (e.g. Organization of Eastern Caribbean States. Georges Declaration, Cartagena Convention) acknowledge that socio-economic development is linked to effective management of natural resources including forests that

function as watersheds and serve as sources of marketable goods such as timber, non-timber forest products (NTFPs), fuelwood and wildlife. There is increasing recognition and value being placed on regional forests for their somewhat less tangible services, which include carbon sequestration, soil conservation, biodiversity conservation and watershed protection. This is evidenced by efforts at national forest policy development, by the previous regional environmental agreements and Caribbean support and ratification of international environmental protocols (e.g. United Nations Convention to Combat Desertification, Framework Convention on Climate Change and Convention on Biological Diversity).

The Caribbean nations occupy a region of the world in which providing adequate supplies of freshwater presents a substantial challenge to governments. In many countries, the annual *per capita* freshwater availability falls far below the 1,000 cubic meters commonly used to measure scarcity. However, the region has a poor track record of water resource management within the watershed, and in terms of groundwater supplies. This affects the sustainability of the water resource itself as well as the associated biodiversity in the watershed and coastal zone, and is adding to land degradation within the Caribbean SIDS (IWCAM 2004).

Most Caribbean islands are volcanic in origin and therefore many rely on overland flow of streams and rivers for their source of freshwater. Given the rugged terrain, friable soils, relatively steep, short river runs and the lack of major natural intermediate collection points (e.g. lakes), many have implemented measures that seek to retain their limited inland forest cover and thereby protect their watersheds. However, regional watersheds and freshwater supplies are adversely impacted upon by side effects of economic development that include:

- Concentrated run-off, increasing point-source pollution as a result of land development for housing and the accompanying construction of roads and drains.
- Soil erosion from agriculture and impact of agrochemicals on the freshwater supplies.
- Abstraction demand for a range of domestic and industrial purposes.
- Inefficient sewerage disposal.
- Improper solid waste disposal.
- River sand mining.
- Improper disposal of industrial effluents.
- Destructive freshwater fishing practices.

Water not only plays a major role in maintaining a healthy quality of life but is also a factor of production, which in the Caribbean is reflected in its critical role in rural agriculture. Agriculture relies mostly on rain-fed production and is the source of livelihoods for many of the rural poor.

The region therefore faces the challenge of securing watersheds and the delivery of water to meet competing demands from the various sectors of economic activity, i.e. tourism, industry, agriculture, and domestic consumption. Inequity in the processes that determine prioritization for water delivery often marginalize the water needs of the poor. The tourism industry in particular imposes high freshwater demands with the “freshwater demand per capita by tourists [being] many times that of residents of island nations” (IWCAM 2004). Furthermore much of the tourism industry is dependent on high environmental quality of beaches and coastal resources including coral reefs (e.g. scuba diving, snorkelling) which in turn is dependant on positive watershed management.

Island economies and social structures are also vulnerable to natural disasters as demonstrated by the devastation wrought by the past hurricane season in the Caribbean. Thus both negative socio-economic and environmental factors pose significant threats to small island development. In a small island context, negative activities in the watersheds induced by either economic activity or catastrophic environmental disturbances have immediate deleterious impacts and while everyone may be directly affected, quite often the most vulnerable members or social groups of society are the most affected.

## 2. Watersheds and poverty linkages in the Caribbean

At the national level, most states lack the financial and human capacity to maintain surveillance and enforcement for the state managed forests which are generally easily accessible to the public. They have traditionally relied on a range of tools for watershed management, including regulation and enforcement, state management of critical areas, education, and encouragement of stakeholder participation. While all of these have had some successes, they have not been able to reverse the loss of tree cover and deterioration of watershed services (Table 1).

**Table 1: Population, economic, and forest resource data for countries in the Caribbean (Source: FAO 2003)**

Country	Population and economic indicators				Forest resources 2000 and forest management					
	Total 1999 (000)	Rural, 1999 (%)	GDP per capita 1997 (US\$)	Annual growth rate of GDP 1997 (%)	Total land area ('000 ha)	Total forest area ('000 ha)	As % of land area	Forest plantations ('000 ha)	Annual forest cover change 1990-2000 ('000 ha)	Annual rate of change (%)
Antigua and Barbuda	67	64.2	7331	n.a.	44	9	20.5	0	n.s.	n.s.
Barbados	301	12.0	n.a.	n.a.	43	2	4.7	0	n.s.	n.s.
Dominica	71	29.6	2940	1.9	75	46	61.3	0	n.s.	-0.7
Dominican Republic	8364	35.5	1659	8.2	4838	1376	28.4	30	n.s.	n.s.
Grenada	93	62.4	3052	n.a.	34	5	14.7	0	n.s.	0.9
Jamaica	2560	44.4	1525	-2.4	1083	325	30.0	9	-5	-1.5
Haiti	8087	65.8	364	1.1	2756	88	3.2	20	-7	-5.7
St. Kitts and Nevis	39	66.7	6032	n.a.	36	4	11.1	0	n.s.	-0.6
St. Lucia	152	62.5	3454	n.a.	61	9	14.8	1	-1	-4.9
St. Vincent and the Grenadines	113	46.9	2335	n.a.	39	6	15.4	0	n.s.	-1.4
Trinidad and Tobago	1289	26.5	4119	3.2	513	259	50.5	15	-2	-0.8

GDP = Gross domestic product

n.a. = not available

n.s. = not significant

Regional research has established that the rural poor of the Caribbean have traditionally relied upon forest based livelihood activities for some of their income (Dunn 2000; Hypolite 1997; John 2001). Forest-based livelihood activities typically supplement needs such as foods, medicinal products, raw materials for NTFP craft products for vending. As a result of this close association, the poor are frequently blamed for the destruction of public forest reserves. However, while deforestation may be driven by poverty related issues, it has seldom proven to be the sole and direct result of poverty. Rather, deforestation may actually result from a multitude of variables including periods of national prosperity.

During the banana industry's boom years of the 1980's, the Windward Islands experienced rapid rates of deforestation as a result of squatting in public forest reserves and banana cultivation on private lands. While the banana industry brought prosperity and improved social standing to rural areas, it proved to be particularly devastating to the watersheds as plantations were established on steep hillsides with little attempt to implement soil conservation measures. Since the mid-1990's, with the removal of preferential trade status with Europe, the industry has lost its "Green Gold" status and experienced a precipitous decline in those involved in banana farming. In St. Lucia, where the industry once employed up to 16,000 registered farmers, by 2003 there were only 2000 farmers (BERU 2003). This

exodus from the banana sector has led to some recovery of secondary forest cover in abandoned plantations but is also thought to have contributed to an increase in illegal marijuana cultivation within forest reserves and this practice has led to significant levels of deforestation on some islands (e.g. St. Vincent). The challenge confronting the region is one of providing sustainable livelihoods that also achieve protection of watersheds and water resources.

## 2.1 Access to water by the rural poor

In many islands of the Caribbean there is limited public infrastructure in place to supply pipe-borne water to homes in rural areas. A study in St. Lucia states a common challenge faced by water delivery companies as one where “population densities in the rural areas are relatively low, the cost of water provision is often higher than in urban areas and lower incomes often makes it harder for consumers to meet full cost of high quality services” (AGRICO Ltd. 2001). In this context, most rural poor have access to water via public standpipes to meet household needs. Those beyond the reach of standpipes rely on water sourced from springs, streams, rainfall and in a few instances from wells. While water may be captured and distributed by national water authorities, it is not uncommon to find that lands adjacent to water intakes are under private land ownership and are under cultivation the water servicing the nearby communities is impacted upon by contaminating activities resulting from the lack of awareness and development control demonstrated through:

- Solid waste disposal in rivers.
- Agrochemical pollution.
- Leakage into rivers from pit latrines and defective or poorly sited septic systems.
- Use of rivers for washing and bathing (especially during periods of water rationing).
- Grazing and tethering of domestic animals along riverbanks.(Geoghegan 2002)

For many rural areas, raw water as well as treated water storage facilities are totally inadequate to meet growing demands especially during the dry seasons. In St. Lucia, unofficial estimates indicate that disruptions in the water supply range between 50-150 days per year, for several hours per day”. This is further complicated by “gross contamination of rural water sources during the rainy season as “Current intake designs are unable to cope with the relatively high levels of silt and debris loading resulting from the soil loss approximating 4 inches of topsoil per year. Consequently interruptions to the water supply during the rainy season may occur for several days ...for clearing of intakes” (AGRICO Ltd. 2001).

In addition, the majority of the rural poor are engaged or employed in the agriculture sector for their livelihoods. Water for irrigation is commonly sourced from nearby streams and rivers via a pump or it may be collected by buckets and stored on site in a large container. The changes in agricultural trade policies has led to an emphasis on increasing efficiency of production on lands deemed suitable to stay under agriculture. Irrigation is regarded as the primary technology option to increase production per hectare. Consequently increases in the demand for water are expected to grow as the technology is encouraged.

In many islands, the public institutions involved in the water sector are challenged by this increased demand for water supply and its accompanying pressure on outdated delivery infrastructure. This has led to implementation of market based instruments aimed primarily at recouping costs from investments. Metering is an option that is viewed as a means of getting the public to recognize the ‘true costs’ of water and providing an incentive to practice water conservation. In most countries where metering has been installed it serves primarily the urban areas. In Grenada, the implementation of metering has been accompanied by the

removal of standpipes thereby cutting off those who can least afford to be cut off from water supply. In St. Lucia, the national water delivery company expects to undertake a new metering exercise in 2005 in its bid to get closer to delivery of "universal service" by means of encouraging private sector participation. The potential impact on the poor is still highly debatable because the company has to factor in the clients who are unable to pay water rates. It is anticipated that there will have to be a revision of rates to reflect costs and that such adjustments are likely to have political consequences.

A common problem is that these market based mechanisms lack a truly holistic approach to water management since the focus is on (a) the ability to install and maintain infrastructure for water capture and delivery and (b) provision of water conservation incentives to the public. These noble objectives still exclude needed incentives to maintain the watersheds which are the primary source of water. The regional forestry departments are left struggling to cope with their mandate of managing protected forests reserves while promoting positive watershed practices on private lands. In some islands, they are embracing the concept of partnering with non government organisations (NGOs), community based organisations (CBOs) and the private sector which they see as a strategy for garnering much needed resources. While this assists the state agencies to achieve their objectives, certain questions remain: Does this strategy serve the interests of communities? Is this an equitable partnership that addresses the needs of the poor and their livelihood needs? What are the incentives that can be provided to induce changes in negative land use practices in upper water catchments?

The research to answer these questions is in its infancy in the Caribbean. Watershed and water resource managers in several other countries are exploring the use of incentives to encourage practices compatible with the provision and enhancement of watershed services. CANARI in partnership with the International Institute for Environment and Development are implementing the DFID funded project *Who pays for water? Preparing for the use of market based mechanisms to improve the contribution of watershed services to livelihoods in the Caribbean* which is the Caribbean Implementation Phase of IIED's *Developing markets for watershed protection services and improved livelihoods*. The project examines the potential of market based incentives to address poverty related livelihood issues in rural areas while ensuring improved water quality and quantity from water catchments. It explores possible arrangements for compensation mechanisms between downstream beneficiaries and upstream 'service providers'.

Increasing the efficiency in water use and management is linked to various types of land use and heightens the need for an integrated policy approach that considers the goods and services provided by forests and watersheds, in terms of reducing erosion and providing protection of water catchments. These services have significant impact on the quality of lives and livelihoods of the rural poor. However, the various regional Poverty Reduction Strategy Papers pay scant attention to the poverty and natural resource or forest resource nexus.

### 3. Poverty in the Caribbean

There has been widespread recognition by the international community of the link between sound environmental management and poverty eradication since the publication of the World Commission on Environment and Development's (the Brundtland Commission) report *Our Common Future* in 1987. This clearly identified the link between poverty as both a cause and a consequence of environmental degradation and called for 'sustainability' to be the guiding principle of future global development. However, it is clear that there has been limited success in integrating the two agendas, to the detriment of both the environment and poor people who have the greatest dependence on forest resources. The disconnect between the two agendas may be explained by a combination of factors including the following:

- A. The value of goods and services generated by natural resources is often not captured in national statistics. Development agencies have tended to undervalue the importance that forest goods and services play in the lives of many poor people and their potential to play a role in poverty reduction.
- B. Natural resource management and environmental organisations have tended to regard poverty reduction as outside their remit, or poverty eradication objectives as impossible to work towards, given their limited funding and budgets.

There are concerns that commitment to sustainable development has weakened, as many of the Caribbean Poverty Reduction Strategies (PRSS) are not adequately addressing the contribution that environmental management can make to poverty reduction despite the fact that MDG 7 is a commitment to 'Environmental Sustainability.'

#### 3.1 Indices of poverty in the Caribbean

While many of the Caribbean Islands are listed as 'middle-income countries', their open economies are very fragile. A combination of impacts from either natural disasters or global economic measures can easily push the 'near poor' or marginally poor into a state of poverty. It is estimated that approximately 334,000 people, or 8% of the population, live in extreme poverty (\$1 a day) in the poorest countries of the Anglophone Caribbean. A further five million Haitians, or 65% of the population live in extreme poverty within the Caribbean Community (CARICOM) (DFID 2004).

Table 2 highlights that six of the eleven countries cited report over 30 percent of their population below the poverty line. St Vincent has twenty six percent below their estimated indigence line. These Country Poverty Assessments also estimate the levels of inequality in income distribution by assessing the Gini Coefficient<sup>1</sup>. The use of the Gini coefficient highlights that while a general economic analysis may lead to many countries being classified as 'middle income', there is 'enormous income inequality' across the Caribbean, with only two OECS countries reporting a ratio of less than 0.40. This indicates that Caribbean countries have amongst the highest levels of inequality in the world.

---

<sup>1</sup> 'The Gini Coefficient, the measure of extent to which actual income distribution differs from a hypothetically uniform distribution. It goes from (0) which equals absolute equality with each individual or household receiving an identical share of income, to (1), which indicates that one person or household earns all the income. Gini coefficients should be estimated using data from national representative surveys, data that covers the entire population'.

**Table 2: Poverty indicators for 11 CPA Caribbean countries (Source: Thomas and Wint 2003)**

Country	Poverty indicators						
	Year CPA	% below US\$1 line	% below poverty line	% below indigence line	Poverty gap	FGT P2 (severity)	Gini Coefficient
Barbados*	1997	na	13.9	-	na	na	0.39
Belize	1996	na	33.0	13.4	8.7	4.3	0.51
Grenada	1999	4.7	32.1	12.9	15.3	9.9	0.45
Guyana*	1999	<2	35.0	19.0	12.4	na	na
Jamaica*	2001	na	16.8	na	na	na	0.38
Nevis	2000	na	32.0	17.0	2.8	1.0	0.37
St Kitts	2000	na	30.5	11.0	2.5	0.9	0.40
St Lucia	1996	2.97	25.1	7.1	8.6	4.4	0.50
St Vincent and the Grenadines	1996	5.5	37.5	25.7	12.6	6.9	0.56
Trinidad and Tobago*	1992	12.4	21.2	11.2	na	na	0.42
Turks and Caicos Islands	1999	na	25.9	3.2	5.7	2.6	0.37

\* Jamaica Survey of Living Conditions, Government of Jamaica, 2001; Barbados, CPA, IDB, 1998; Guyana CPA, UNDP, 2000; Trinidad and Tobago, World Bank, 1999. All other CPAs conducted by CDB.

### 3.2 Regional poverty reduction strategies

In principle, CARICOM governments had committed themselves to poverty alleviation and in many cases poverty eradication as a major policy goal even before the Millennium Development Goals (MDG) were adopted. However priorities for poverty reduction have tended to focus on the socio-economic dimensions and it is arguable that this emphasis has continued since the regional adoption of MDG goals.

This reflects a general shortcoming of regional PRSP policies in that the approach largely excludes the need to intersect poverty alleviation policies with environmental policy measures. It also reflects a limited recognition of the role that natural resources serve in poverty reduction, particularly for the rural poor and that "economic differentiation is often rooted in unequal access to natural resources and to the knowledge or technology necessary for their equitable, sustainable and profitable use" (DFID-NRSP 2001). There appears to be a disconnect between the 'development' sector and the 'environment' sector. Policy initiatives such as PRSPs and National Sustainable Development Strategies (NSDS) should reflect a more holistic approach.

The gaps in the traditional income-based definition of poverty have led to an increasing acceptance of the Sustainable Livelihoods approach. In this more holistic framework, poverty reflects the lack of or limited access to the various types natural and social capital that are required to maintain a livelihood, a physically healthy and balanced state of life. It defines the various forms of natural capital (water, land, forests, fish, energy resources, and minerals); social capital (relationships of trust and reciprocity, groups, networks, customary law); human capital (skills, knowledge, beliefs, attitudes, labour ability, and good health); physical capital (basic infrastructure); and financial capital (monetary resources) (UNDP 1999). The Sustainable Livelihoods approach facilitates examination of access to the various elements

of capital and thereby assists in determining levels of vulnerability to poverty from a holistic approach.

In the Caribbean, poverty related issues were once perceived as the domain of the ministries responsible for social and gender related affairs. However, there has been a shift and ministries including those involved in agriculture, forest and watershed management are striving to incorporate poverty related policies in overall policy formulation (e.g. land policies, water policies, biodiversity policies). The challenge is to focus these efforts and coordinate strategies and resources allocated under these various portfolios for poverty alleviation.

#### 4. Integrated approaches to planning in watershed management

The need for integrated planning and management of economic activities and forest conservation to ensure continuity in provision of forest services has been acknowledged by regional governments. This approach has recently taken shape as the Integrated Watershed Resource Management (IWRM) methodology. It is attractive to governments and is promoted by international development agencies operating in the region (e.g. USAID “Ridge to Reef” initiative in Jamaica). It seeks to tackle problems within the context of the entire watershed basin and thus merges the management of socio-economic issues with natural resource management. This is reflected in the recently approved regional project; “Integrating Watershed and Coastal Area Management (IWCAM) in the Small Island Developing States of the Caribbean” project funded by the Global Environmental Facility and implemented by UNEP, UNDP and the Caribbean Environmental Health Institute (CEHI). This states that *Most Caribbean Governments are finding it increasingly difficult to reconcile the need for economic growth with rapidly expanding populations, and with the need to raise living standards for a large and growing number of the poor.* In response to these issues IWCAM is seeking to develop an effective regional strategy that captures best practices and translates these into replicable actions across the region. The Integrated Watershed Resource Methodology acknowledges that the involvement of key stakeholders is integral to the effective implementation of project plans. Such conclusions are supported by research undertaken by CANARI that evidences the effectiveness of participation in the planning and execution of natural resource management.

## 5. Participatory forest management in the Caribbean

CANARI's research has revealed increasing acceptance of forest management partnerships in the Caribbean that involve forest management agencies, NGOs, community groups, businesses, local resource users, and technical assistance organizations. The different stakeholders often play multiple roles, including mobiliser, partner, facilitator, regulator, and technical advisor. NGOs have been crucial in supporting participation of weaker community and resource user groups. Although in many countries experience in the use of Participatory Forest Management (PFM) is still quite limited, forest managers generally view it as useful in securing public support for forest resource protection and management. The costs, in terms of both staff time and money, of effectively engaging stakeholders in management arrangements are a widespread concern, especially since the budgets of most forestry agencies do not include any provision for such expenses. These costs include training and technical support for non-governmental partners, whose capacity is often overestimated initially. In many cases, support for PFM activities has come from donor agencies and is therefore short-term (Geoghegan 2002).

Non-governmental stakeholders involved in these examples tend to see PFM within a larger context of sustainable development with links to other sectors and issues. Their involvement in PFM arrangements often reflects an *interest in increased income, improved livelihood security, or enhanced quality of life through the improved management of forest resources* (CANARI 2002). It is these expectations that are leading to a dynamic policy environment that is opening up to the possibilities of creative approaches to addressing watershed management in the region while tackling poverty based issues. This is backed by the realization that many of the current regional forest policies, land use policies and related water policies are inadequate in addressing this need. While most government agencies accept the concept of PFM, centralized management structures still dominate forest management in the region.

### 5.1 Grenada's National Forest Policy

Examples of PFM in the region include changes at the policy level as demonstrated by the highly participatory process undertaken in Grenada's formulation of its National Forest Policy. This process took place between 1997 and 1998 with funding support of UK-DFID and facilitation by CANARI. This national forest policy development strategy proved to be innovative in its approach since it broke with the traditional regional approach of forest policies being set by government forestry departments. Over the one year period the process moved through stages that involved establishment of a Forest Policy Process Committee consisting of representatives from the forestry sector, tourism sector, agricultural sector, hunting and fishing association, environment and health. It involved a visioning exercise with the Grenada Forestry Department, a scoping exercise to identify stakeholders, review of legislation, field visits, broad national consultations with 14 communities and women's groups; media use and coverage involving a TV documentary and radio phone-ins to capture stakeholder views on forestry issues. "The process was designed as a comprehensive package by stakeholders in Grenada- and not by foreigners. Time and space was deliberately given for stakeholders to learn one another's perspectives and to change their minds. Many people consulted felt that they played key roles and that "the outputs of the process, notably the resulting policy, are widely 'owned'. The policy was variously described by interviewees as the 'nation's policy, the 'people's policy or... the 'policy of poor people', and equally was qualified as being more than the property of the Forestry Department or government" (Bass 2000).

## **5.2 Jamaica's local forest management committees (LFMC)**

In Jamaica, in growing recognition of the need to adapt to the challenges of managing national forest resources to maintain forest services while meeting the needs of the populace, the Forestry Department has also embraced the concept of participatory based approaches to forest management in its support for Local Forest Management Committees. The LFMCs represent joint effort by the Forestry Department and community members to incorporate the needs of stakeholders in management of watersheds in the Buff Bay/Pencar area. The Forest Act of 1996, although defining a centralised management structure, also allows for stakeholder input through management committees. This Act was followed by a National Forest Management and Conservation Plan and an updated Forest Policy that were adopted in 2001. These documents outline a central role for stakeholders in managing forest resources and "indicate that the primary mechanism for implementing the strategy of community participation is the establishment of Local Forest Management Committees (LFMC)." The LFMCs consist mainly of representatives of formal organizations in the communities however its meetings are an open forum that individuals can freely participate in. The LFMCs have served the interest of local people seeking licenses to harvest trees within the watershed, assisting with reforestation, and serving as honorary game wardens and forest wardens. The Pencar LFMC under a Memorandum of Understanding with the Forestry Department has established a plant nursery which sells seedlings to farmers in the watershed. The project has received financial support from the Foundation of International Training, in conjunction with the Enhancing Civil Society Project, both of which are CIDA sponsored (Geoghegan and Bennett 2003).

## **5.3 St. Lucia: Talvern Water Catchment Group**

In St. Lucia, the Forestry Department identified the Talvern water catchment as one of five seriously degraded watersheds and sought to remedy the problem through community participation in a watershed recovery initiative. The Talvern Water Catchment Group (TWCG) is a community based organization that emerged out of concern about water quality being captured by the local Water and Sewerage Company to serve Talvern and adjacent communities. The Group in partnership with the Forestry Department received technical advice and grant support to implement riverbank tree planting and promotion of soil conservation practices among farmers of this water catchment. Ninety eight percent of the catchment is under private land tenure and largely under agriculture. Much of the early dynamism behind the TWCG's activities was built on a strong sense of collective responsibility and community pride that was channelled towards environmentally related concerns. Their services included riverbank stabilization by establishing wattles, grasses established in barriers to reduce erosion (e.g. khus khus), timber tree planting and fruit tree planting( citrus species, breadnut, mango). They provided water quality maintenance through debris removal from stream (plastics and coconut debris) and public education. Although much of the Group's efforts were based on volunteerism, the practical business of procuring materials to protect the riverbanks led to the need for financing. Funding support, by way of grants, provided for meeting some of the labour costs. The Forestry Department assisted in meeting these objectives by way of project proposal development and grant procurement from the OECS-NRMU and the Poverty Reduction Fund. Through this process came employment opportunities for TWCG members and other community members in establishment and maintenance of plants.

## **5.4 Trinidad and Tobago: The Fondes Amandes Community Reforestation Project**

In Trinidad and Tobago, the Fondes Amandes Community Reforestation Project is as a community based organization that has acquired approval for management of state owned water catchment lands which serve the national Water and Sewerage Authority. Over 20

years ago, members of a squatter's community, began farming traditional vegetable short crops on the hillside of Fondes Amandes, St. Anns, north Trinidad. In an effort to control the annual bush fires that came with the dry season, excessive soil erosion and flooding during the rainy season, and resultant heavy siltation of river and water works, they began to plant fruit-bearing tree crops interspersed with hardwood trees. The attempt was unsuccessful due to annual fire damage and a particularly devastating fire in 1987. Subsequent fire prevention training received by the leaders of the Group, and passed on to other community members, has gradually ensured that there has been more resistance to fires and survival of more trees. This community-initiated watershed restoration and protection project supplies food and employment for its members, protects the Fondes Amandes watershed and encourages wildlife protection (Lum Lock 2003).

The initiatives mentioned above are indicative of the potential role that stakeholders can play in national forest policy development, promoting positive watershed management practices and water conservation given a suitable policy context. The Integrated Watershed Management approach also realizes the role of various stakeholders including the poor. Such arrangements foster networks which are vital for including and empowering the rural poor in planning processes.

## 6. Conclusions

For many islands, the challenge of achieving sustainable development is significantly threatened by increasing populations, open and fragile economies and the impact of social health issues including HIV-AIDS. Globalisation and the inability to compete economically in agriculture, which is one of the primary income earning sectors has led to stagnation in the economies of many islands over the past decade further exacerbating poverty- related problems. Poverty reduction in the Caribbean is expected to occur within the context of regional sustainable development. This requires inter-sectoral planning and management that extends beyond the agencies and institutions directly involved in forest management and water distribution. It calls for policy makers and decision makers involved in socio-economic policy formulation to factor in the value and costs of natural resource management in poverty reduction strategies and national sustainable development strategies.

The contribution that forest resources can make to poverty alleviation can only be realised once there is equity among the stakeholders in management (i.e. the sum of policies, institutions and capacities). Evidence suggests that participatory approaches can help strike a balance between winners and losers in management. Governments can provide leadership by fostering a policy environment that encourages participatory based approaches and policies that acknowledge and protect the interests of the poor. Regional participatory based approaches to forest and watershed management initiatives such as the ones described in the report illustrate the Caribbean's willingness to adapt to the challenge and experiment with institutional reform that is more inclusive. National land, forest and water policies should emerge out of truly participatory approaches and from forums where the needs of the poor are openly expressed.

If rural upper water catchment land owners are expected to bear the responsibility and costs of watershed conservation, then incentives to induce positive practices should consider traditional patterns of land tenure and the socio-economic needs of rural communities. The issue of equity regarding the primary beneficiaries of water services should be reflected in rate structures and in the distribution of funds provided for maintenance of watersheds.

## References

- AGRICO Ltd. 2001. *Report on national situation and assessment of national water profile Saint Lucia*.
- Bass, S. (2000) *Participation in the Caribbean, A review of Grenada's forest policy process*. International Institute for Environment and Development. United Kingdom.
- BERU (2001) *St. Lucia Banana Industry Strategy Task Force. Final Report*. Castries, St. Lucia.
- CANARI (2002) *Participatory forest management in the Caribbean: Impacts and potentials*. CANARI Policy Brief No. 1. Caribbean Natural Resources Institute. Trinidad and Tobago.
- DFID (2001) *Jamaica: Country strategy paper*. Department for International Development. United Kingdom.
- DFID (2004) *Regional Assistance Plan for the Caribbean*. Department for International Development. United Kingdom.
- DFID-NRSP (2001) *Locating a poverty focus in natural resources system research*. DFID Natural Resources Systems Programme (DFID-NRSP) United Kingdom.
- Dunn, J. (2000) *The socio-economic importance of Non-timber Forest Product (NTFP) use in Grenada: A study for the Forest Policy review process*. Grenada Forest Management Project. Grenada.
- FAO (2003) *State of the World's Forests*. FAO. Rome.
- Geoghegan, T. (2002) *Incentives for watershed management in St. Lucia: Results of a brief diagnostic*. CANARI Technical Report No. 317. Caribbean Natural Resources Institute. Trinidad and Tobago.
- Geoghegan, T. (2002) *Participatory forest management in the insular Caribbean: Current status and progress to date*. CANARI Technical Report No. 310. Caribbean Natural Resources Institute. Trinidad and Tobago.
- Geoghegan, T. and N. Bennett (2003) *Risking change: Experimenting with Local Forest Management Committees in Jamaica*. Gatekeeper Series No. 110. International Institute for Environment and Development. United Kingdom.
- Government of Dominica (2003) *Interim poverty reduction strategy paper*. Ministry of Finance and Planning. Roseau. Commonwealth of Dominica.
- Government of Grenada (2003) *Country strategy paper and national indicative programme for the period 2001-2007*. Grenada.
- Government of Saint Lucia (2003) *Interim poverty reduction strategy and action plan for Saint Lucia*. Ministry of Social Transformation, Culture and Local Government. Castries, Saint Lucia.
- Hypolite, E. (1997) 'Oil from our forests' in *The New Forester*. Vol. IX. Forestry and Wildlife Division, Ministry of Agriculture and Environment. Commonwealth of Dominica.

IWCAM (2004) *Integrating Watershed and Coastal Area Management (IWCAM) in the Small Island Developing States of the Caribbean* (project brief). UNDP, CEHI.

John, L. (2001) 'The latanyé (*Coccolobus barbadensis*) craft industry in St. Lucia'. Forestry Department, Ministry of Agriculture, Forestry & Fisheries, Castries, St. Lucia. Available on line at: [http://www.slumaffe.org/Research\\_Papers/research\\_papers.html](http://www.slumaffe.org/Research_Papers/research_papers.html)

Lum Lock, A. (2003) 'Background paper on Fondes Amandes Community Reforestation Project' (unpublished). Paper prepared for the First Meeting of the Regional Action-Learning Group on Markets for Watershed Services and Improved Livelihoods, 27-28 April 2004, CANARI, Port of Spain, Trinidad.

McDonald, T. and E. Wint (2003) 'Inequality and poverty in the Eastern Caribbean' prepared for the ECCB Seventh Annual Development Conference, November 2003.

UNDP(1999) *Attacking poverty while improving the environment: Toward Win-Win policy options*. Social Science Research Council. New York.

UNDP (2004) *Regional report on the achievement of the Millennium Development Goals in the Caribbean Community*. United Nations Development Programme. New York. USA.

World Commission on Environment and Development (1987) *Our Common Future*. Oxford University Press. United Kingdom.