CARIBBEAN NATURAL RESOURCES INSTITUTE (CANARI)

Report on the fifth meeting of
the Forests and Livelihoods Action Learning Group (ALG)

October 2009

Executive Summary

Introduction
The fifth meeting of CANARI's *Forests and Livelihoods* Action Learning Group (ALG) was held in Grenada on 5-7 October 2009.

CANARI's *Forests and Livelihoods* programme concentrates on research and capacity building activities designed to maximise the contribution of forests to improving the quality of life of poor people in rural communities in Caribbean islands. The ALG is a multi-sectoral group that includes individuals from key national and regional institutions and civil society organisations (CSOs) who can contribute skills, knowledge and experience to research and capacity building on forests and livelihoods and who are in a position to share learning on project findings within their countries, institutions and sectors. The group includes representatives from technical and financial support agencies, forest management agencies and agencies involved in poverty reduction and rural livelihoods.

The meeting focused on:
- analysing and documenting lessons learnt from various activities under CANARI's Forest and Livelihoods Programme;
- updating participants on forest-based livelihood activities in the region highlighting those of CANARI's Forest and Livelihoods Programme;
- introducing the tools of monitoring and evaluation and engaging ALG members in developing a monitoring and evaluation for CANARI's Forests and Livelihoods programme;
- further developing the communication strategy for the EU project;
- seeking validation on lessons learnt during various activities under the project;
- planning future activities.

Workshop Summary

The group of 19 (inclusive of 2 CANARI staff) participated in two days of workshop activities and, one field trip day to Morne Longue, which included interviews, small group work and a panel discussion.

On the first day, CANARI provided an update of the activities under the project and the ALG reciprocated with sharing how they have applied the lessons learnt so far from the project. Claus Ecklemann then shared with the ALG some of the outputs of the land cover project for islands of the region. Specifically, he reviewed maps and associated data sets for Barbados and Grenada showing the extent of forest cover. He also provided updates on the status of the project in other islands of the Caribbean. This presentation was followed by a session on monitoring and evaluation facilitated by Nicole Leotaud. The ALG found the session quite interesting and useful. It should be noted that after this session the ALG made deliberate attempts to use the newly introduced terminology and concepts while discussing issues at the meeting. Neila Bobb-Prescott then presented on the preliminary findings of the CARUTA study on the impact of climate change on forest-based livelihoods and facilitated a focus group discussion on observations from the various islands. The formal sessions for the day culminated with a briefing and small group preparatory work for the field trip.

On the second day, the group journeyed to Morne Longue, where the ALG were introduced to Morne Longue Progressive and their partners and then attempted the Fedon trail. The ALG then dined with the community members and utilised the opportunity to interact and exchange ideas with community members while seeking responses to the research questions of the project. After lunch, the ALG hosted a panel discussion featuring Morne Longue Community Group and its partners. However, the panel discussion and the planned small group reports were prematurely terminated because of heavy rain showers which made hearing each other impossible.

The final day commenced with the small group reports and analysis of lessons learnt and the formulation of recommendations for the Forestry Department on the Morne Longue initiative. This was followed by a plenary session to further define the communication strategy of the project by compiling a listing of pathways for specific target audiences. ALG members then shared their plans on how they intended to implement lessons learned under the project and were then invited to make recommendation for future activities in CANARI's Forest and Livelihood Programme.
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LISTS OF ACRONYMS AND ABBREVIATIONS

ALG	Action Learning Group
CANARI	Caribbean Natural Resources Institute
CBO	Community Based Organisation
CSO	Civil Society Organisation
EC	European Community
EU	European Union
FAO	Food and Agricultural Organisation of the United Nations
GRENED	Grenada Education & Development Project
GREP	Grenada Rural Enterprise Project
LFMC	Local Forest Management Committee
NFPF	National Forest Programme Facility
NGO	Non Governmental Organisation

SECTION 1 - INTRODUCTION

1.1 CANARI'S FOREST AND LIVELIHOODS PROGRAMME

The Caribbean Natural Resources Institute (CANARI) is a regional non-profit technical organisation dedicated to working at multiple levels to develop, test, promote, support and encourage local, national and regional efforts aimed at improving resource management and the livelihoods of those who depend on a given resource through inclusive, participatory management approaches.

One of the organisation's principal means of achieving these objectives is by working with local organisations to build their capacity to contribute to poverty reduction and environmental management. One of CANARI four major programmes is the ***Forests and Livelihoods*** programme, which concentrates on research and capacity building activities designed to maximise the contribution of forests to improving the quality of life of poor people in rural communities in Caribbean islands.

The programme is currently supporting two main projects, as follows:

- A regional project on ***Participatory Forest Management: Improving policy and institutional capacity for development*** is being implemented in partnership with the forestry departments of the project countries of Barbados, the Commonwealth of Dominica, Grenada, St Christopher (Kitts) and Nevis, Saint Lucia, St Vincent and the Grenadines and, Trinidad and Tobago, with funding support from the Food and Agriculture Organisation of the United Nations' (FAO) National Forest Programme Facility (NFPF). The Jamaica Forestry Department has its own NFPF funding but participates in and contribute to the regional activities. This project is being conducted over the period 2006 to 2010.

- A second regional project on ***Practices and policies that improve forest management and the livelihoods of the rural poor in the insular Caribbean*** is funded by the European Commission. The project is being conducted in Barbados, the Commonwealth of Dominica, Grenada, Jamaica, St Christopher (Kitts) and Nevis, Saint Lucia, St Vincent and the Grenadines, and Trinidad and Tobago, over the period 2007 to 2010.

1.2 THE REGIONAL ACTION LEARNING GROUP

The European Commission-funded project on ***Practices and policies that improve forest management and the livelihoods of the rural poor in the insular Caribbean*** includes the formation of a group of change agents known as the regional Action Learning Group (ALG) on ***Forests and Livelihoods***. The ALG is the main mechanism through which CANARI analyses and disseminates learning derived from Forests and Livelihood programme activities.

The ALG is a multi-sectoral group that includes individuals from key national and regional institutions (government and civil society) who can contribute skills, knowledge and experience

to research and capacity building on forests and livelihoods and who are in a position to share learning on project findings within their countries, institutions and sectors. The group includes representatives from technical and financial support agencies, forest management agencies and agencies involved in poverty reduction and rural livelihoods.

The strength of the group lies in its independence, range of experience, non-bureaucratic and participatory approach, and the participation of motivated people who can disseminate learning and shape opinion. See Appendix 1 for the ALG Concept Note.

ALG meetings are held in the various project countries, when additional stakeholders from the host country are invited to participate in the meeting. There were twenty-four (24) participants from Trinidad and Tobago, Saint Lucia, Jamaica, St Vincent and the Grenadines, Dominica, Grenada and Barbados. A participant list for this meeting can be found in Appendix 2.

1.3 MEETING OBJECTIVES AND AGENDA

The objectives of the meeting included:

1. To **provide updates on activities** under CANARI's Forests and Livelihoods programme;

2. To **share experiences and findings** of the main projects of the *Forests and Livelihoods* programme and any other relevant projects and initiatives in the region on using forests for socio-economic benefits, whether implemented by CANARI or other members of the ALG.

3. To **extract and document lessons learnt** on institutional arrangements that optimise the socio-economic benefits to the rural poor from forests from exchange visits and national workshops, small grant programme for Community-Based Organisations the forests & livelihoods Action Learning Projects (ALPs) and mentoring experience;

4. To **review findings and analysis** of the paper submitted to the World Forest Congress in October 2009, "Moving from rhetoric to reality: how can participatory forest management contribute to improving the livelihoods of the rural poor in Caribbean small island states?"

5. To **refine the key elements** of a **communication strategy** for the *Forests and Livelihoods* programme, targeting specifically main target audiences and media (products and pathways);

6. To **discuss and refine** the proposed concept for the May 2010 conference, "Forests for People, People for Forests: Forest-based livelihoods in the Caribbean" and to identify roles for the ALG members;

7. To **discuss and document** the impact of climate change on forests and forest-based livelihoods in the Caribbean;

8. To **introduce** monitoring and evaluation as a management tool

A copy of the meeting agenda can be found in Appendix 3.

SECTION 2 – SUMMARY OF DAY 1

2.1 OPENING CEREMONY, WELCOME AND INTRODUCTIONS

The meeting commenced with an opening prayer by Denyse Ogilvie of People in Action followed by a welcome by Mr. Aden Forteau, Chair for the proceedings and Chief Forest Officer of Grenada's Forestry Department. Mr. Forteau delivered a passionate address emphasising the importance of working with communities and presented logical arguments supporting the reduction of poverty through participatory management and wise use of natural resources. Mr. Forteau then introduced the Honourable Denis Let, Minister of Agriculture, Forestry and Fisheries.

The Honourable Minister delivered the feature address that included a listing of the United Nations (UN) International Conventions that Grenada is a signatory to, such as the UN Convention on Biological Diversity and the UN Framework Convention on Climate Change. The Minister also delivered a useful context for the rest of the meeting clearly describing sustainable forest-livelihood opportunities in Grenada and identifying possible opportunities for synergies and cooperation. He also supported the bottom-up approach to management of the forest and publically commended the Forest Officers present for their contribution to the development of sustainable forest-based livelihoods in Grenada.

The session culminated with an eloquent and concise vote of thanks moved by Mrs Gloria Payne Banfield of Grenada Education and Development Project (GRENED).

2.2 RECONNECTING WITH THE PROGRAMME

2.2.1 Overview of meeting and review of third ALG meeting

Neila Bobb- Prescott presented the objectives of the meeting, gave a brief overview of the agenda for the meeting and facilitated discussion on the report of the third ALG meeting held in Saint Lucia. The presentation is in Appendix 4.

There was lengthy discussion on the lessons identified from the field visit to Gros Piton Trail which read:

"Forestry can better manage natural resources when people are better managed."

Members felt that the words convey the meaning that communities are used and not part of the process. They felt that the message should be changed to emphasise the current paradigm shift of community participation in forest management. There was consensus on the following statement:

"Forests will be better managed when people/communities are effectively and equitably involved in the process"

2.2.2 Update on Programme Activities

The following are highlights of activities discussed under CANARI's Forest and Livelihoods Programme.

Action Learning Projects

Nicole Leotaud reported that CANARI was awaiting the final report from Nature Seekers. She informed the meeting that she will analyse the final reports on all of the ALPs and produce a draft summary report for circulation that brings together the lessons learned from the ALP activity.

Small grant programme

Mrs. Prescott reported that the call for proposals and concept note was sent to sixty-seven CBOs in the seven project countries. Eighteen responses were received and reviewed by four ALG members (Marcella Harris, Robyn Cross, Noel Bennett and Felix Finisterre).

It was noted that six applications were received from groups from the Commonwealth of Dominica. ALG member, Marcella Harris, then reported that she had held a meeting to mobilise CBOs at which she had worked with the groups to stimulate ideas and formulate the project document. She also noted that the groups that submitted applications attended the national workshop. The ALG recognised the value of these activities in mobilisation of applicants.

The reviewers then shared their experiences with the group.

Shared Experiences of Small Grant Reviewers
- It was difficult to judge the age of groups from the information given on the form.
- Requesting information about the age of the groups can serve as a deterrent to new groups who want to apply.
- Some applicants felt that they had to show they were well connected by calling names of renowned people and organisations.
- Some applicants gave so much information that that at the end of the application form, it was not clear what was intended.
- The application form should more directly state the criteria used in the assessment.
- Applicants needed to clearly state how the project would help the group.

The meeting then agreed on the following actions.
- The application form should be revised to directly request information that would address the criteria needed for assessment of the application.
- ALG members should be included to offer support in the application process in each country.
- Strengthen the support given to project planning in the national workshops.

Exchange visits

Mrs. Prescott reported that one exchange visit was executed among the Local Forest Management Committees in Jamaica and three others were scheduled to take place. One on community based tourism in St. Lucia to be facilitated by Felix Finisterre, another on Protected Area Management to be facilitated by Susan Otuokan in Jamaica and finally one to be done on participatory planning process for Aripo Savannas an Environmentally Sensitive Areas in Trinidad and it is to be facilitated by Nicole Leotaud. Other suggested themes and sites would be discussed in the "Next Steps" session on the final day.

National workshops

Mrs. Prescott reported that two of the either workshops were executed in Tobago and Grenada . Four others (in St. Vincent, Jamaica, Nevis and Barbados) were scheduled to come off before the end of the year. Mrs. Prescott revealed that she was experiencing some challenges in scheduling the workshops in Saint Lucia and the Commonwealth of Dominica.

Case studies

The following update on the case studies was shared with the meeting.

Case study	Status	Action
1. Wamme Letang, Dominica	• Draft sent to community, UNDP, ALG	• To be finalised • Need to decide on mode for dissemination
2. LFMC, Jamaica	• To be drafted	
3. Grand Riviere, Trinidad	• Drafted	• Needs to be circulated to community and finalised
4. St. Vincent	• Drafted	• To be reviewed and finalised
5. Gros Piton, St. Lucia	• Drafted	• To be reviewed and finalised
6. Dolphin Head, Jamaica	• To be drafted	
7. Morne Longue, St. Andrews, Grenada – ALG5	• To be drafted	
8. Fondes Amandes, St. Ann's, T'dad	• To be drafted	

Climate change and forest-based livelihoods

The meeting was informed by Mrs. Prescott that CANARI had recently entered into a contract with the United Nations Development Programme (UNDP) under its Caribbean Regional Unit for Technical Assistance (CARUTA) project to conduct a study on:
- a) assessing what community initiatives exist in Antigua and Barbuda, Barbados, Commonwealth of Dominica, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago and the linkages to sustainable use of forest resources and climate change;
- b) identifying potential interventions through participatory assessments;

c) recommending specific projects linking use of forestry resources and climate change; and

d) providing guidance on advocacy at governance level on effective ways to bring attention to the linkages between climate change and community use of forest resources.

She reported that preliminary results from this study revealed that in specific countries, namely Trinidad and Grenada, forest-based livelihoods were being affected by climate change impacts. For example at the consultation in Trinidad, Managing Director of the Fondes Amandes Reaforestation Group, Akilah Jaramogi, indicated that the intense showers had led them to forage for seeds used for jewelry-making in new areas. While, reports from Grenada described how sea water spray and subsequent salt deposit on the habitat of Grenada's national bird, the Grenada Dove, during hurricanes contributed to the deterioration of the habitat.

The session culminated with probing questions to stimulate ideas for future plans for the activities of CANARI's Forest and Livelihoods programme. Suggestions included projects to encourage the use of new technology in forest management e.g. Biochar and strengthening the capacity of forest managers in the region by providing training in communication.

2.3 MEMBER UPDATES

ALG members shared some of the relevant activities in which they had been involved since the last ALG meeting. Highlights included the following:

Forest policy development in the region

Dr. Howard Nelson reported that Trinidad and Tobago had once again restarted the process of reviewing its Forest Policy and formulating a Protected Areas Policy. He indicated that this was a significant move as the last approved Forest Policy was approved in 1942 and undoubtedly the document was clearly obsolete. He also informed the ALG that the process was participatory.

Mr. Gordon Patterson reported that Grenada was mobilising resources to review its Forest Policy. He also mentioned projects such as the GEO tourism project and the Integrated Water Resource Management Project in Caricou, which all provide useful information that could feed into the drafting of the new policy and also serve to build capacity for CBOs and government institutions to participate in development of the Forest Policy.

Mr. Minchinton Burton also indicated that Dominica was in the process of finalising the Terms of Reference for the drafting of a policy for the Forest Sector which would also utilise a participatory process.

Influence of the ALG

Marcella Harris revealed that she could not identify a single project that her involvement in the ALG had impacted on. Rather she thought that her involvement in the ALG has influenced the way she communicates with people. Her exposure has caused her to consider more closely the message she is attempting to communicate, the target audience and the pathway.

Noel Benett added that the visit of the ALG to Dolphin Head in Jamaica had encouraged the residents to formalise their structure and become a Local Forest Management Committee. He further added that the funds provided for the first exchange visit were used to convene the first ever national conference for the Local Forest Management Committees. The participants of this conference felt that this meeting and exchange was so useful that they have decided that the meeting would serve as model for future meetings and be held annually from now on.

Zakiya Uzoma-Wadada reported that she also has recognised the influence that the ALG had made and had approached other organisations, for example the Global Water Partnership, about adopting some of the tools and methods utlised by the ALG.

2.4 LAND COVER DATA PROJECT

Claus Ecklemann delivered a brief presentation (Appendix 5) on the land cover project of United States Geological Survey (USGS),International Institute of Tropical Forestry(IITF) and United States Agency for International Development (USAID). He explained how the land cover maps for Barbados and Grenada could be utilised for management decisions.

2.5 MONITORING AND EVALUATION

Nicole Leotaud facilitated a role play, followed by a brief interactive presentation on monitoring and evaluation and particularly on outcome mapping (Appendix 6), small group work to identify desired behaviours of 'boundary partners' (handouts and worksheets in Appendix 7), and a plenary discussion with an opportunity for the ALG to comment on what they had learnt in this session.

2.5.1 Role Play

ALG members were asked to observe members of the group as they acted out how they would react if they met and influential person and what would they say to get some resources for some chosen forest and livelihoods project.

Comments of ALG members

- Make sure the name of the organisation is clearly stated.
- Show a connection with past projects.
- Link your organisation's activities with an identified need for the Caribbean region.
- Know areas what the donor funds.
- Pay attention to the pace and tone of words used.
- Acknowledge the work that is being done by the donor.
- Pay attention to non-verbal clues while pitching your idea.

2.5.2 Introduction to Outcome Mapping and Small Group Work

Nicole Leotaud gave an overview of monitoring and evaluation and introduced the outcome mapping approach. This emphasises identifying key stakeholders that you want to change (your 'boundary partners') and a progression of desired changes in behaviour (which are your indicators).

The ALG identified key boundary partners of CANARI's **Forests and Livelihoods** programme. Participants were then divided into small groups to identify desired behaviour changes for Forestry Departments, the line Ministry for Physical Planning, the ALG itself and the political directorate. The results of the small group work are shown in the table below.

Boundary partner	Forestry Departments	Line Ministry for Physical Planning	CANARI's Forests and Livelihoods Action Learning Group	Political directorate
Desired outcome (behaviours)	• Developed clear guidelines, a MOU outlining responsibilities, relationships and roles and negotiated = a written agreement with the CBOs. • Successful projects implemented with partners • Invite CBOs to negotiation, planning meetings, and strategic meetings • Feedback/ comments. • Networking with other government departments. Sharing information with respect to the department's work.	• Engaging stakeholders • Giving Feedback • Monitoring/ Evaluation	The ALG is a change agent within the Caribbean region with respect to the implementation of part processes for the management of forests and livelihoods. It facilitates the development of relationships to exchange of information among relevant technical persons in the Caribbean and catalyses change both at the level of government, community based organisation and as regards education and training.	Not defined
"Expect to see"	• The forestry department will agree to have	Ensure common, clear understanding	• Maintenance of regular communication	• Acknowledge-ment • Verbal

	joint meetings • The forestry department will invite stakeholders in forest based livelihoods to meetings to work out agreements. • Forestry Department will create the environment to allow the BOs to invite them (the Forestry) to their meetings. • Forestry Department will facilitate training for its staff and CBOs to participate effectively in the process for project working.	and agreement of working language by donor and recipient.	and appropriate linkages among of technology. • Use of existing technology to formalise communication process which enables continued networking, sharing of information and building of relationships between meetings.	commitment
"Like to see"	• The Forestry Department invites CBOs and NGOs in forests based livelihoods to <u>strategic</u> planning meetings. • The Forestry Department will respond to request from CBOs and NGOs to manage areas. • Forestry Department will indicate a willingness to participate in CBOs meeting (showing support).	Empathy, trust/ respect where genuine misunderstanding occur	• Invitation of dialogue with Boundary Partners to promote sustainable forests and livelihoods. • Provision of information to Boundary Partners.	• Workshop for discussion on the issue • System put in place to address communication and formation of a team to review EIA, etc.
"Love to see"	• The Forestry Department will engage in	Flexibility/adaptati on: mutual consultation.	• The ALG will directly influence on policy change	• Explicit policy statement by political

	networking. • The Forestry Department will include CBOs in concept/project proposals. • The Forestry Department calls/host meeting on partnerships • The Forestry Department will include budgets for development of relationships for co-management. • Forestry Department is invited to CBO meetings regularly. • Forestry Department invited to strategic planning meetings of other Government Departments.		and direction. • The ALG will facilitate the development of appropriate relationships and partnership among stakeholders at both government and community levels. • The ALG will directly influence the creation of participation of National Action Programmes on Sustainable forests and livelihoods. • The ALG will directly influence curriculum and or content of education/training programmes.	directorate • Effective institutional arrangements developed
Issues to consider:	• Behaviour of Forestry Department and behaviour of those working with Forestry Department. • Traditional methods do not put funding – line items – for working with local communities • Dream on • Need little steps to track • Budgeting process: Fighting for line items technical people	• Annoying communities in infrastructural development projects. • Need to check implication (need to seek input of stakeholders) before approval of projects.	• Life of ALG beyond funding from the EU project.	

	want budget this way – etc. takes appreciation of the items etc.			

The exercise stimulated the following additional comments from the ALG.

- Budgeting in government needs to be participatory, allowing communities to put pressure in demanding how money is spent in the communities.
- There is a culture of "learned helplessness" in the region. It is essentially "don't ask for it because you would not get it anyway".
- Who really decides policy? It is finessed by public officers, written by public officers, in some instances made and implemented by public officers. During this process of drafting and implementation it goes through so much change that in some instances it does not do what is required at the right time.

2.5.3 Facilitated discussion on issues for the implementation of monitoring and evaluation

After the presentation ALG members highlighted issues concerning the implementation of a monitoring and evaluation system in their respective countries:

General Comments

- At best government is suspicious of people, sometimes very suspicious/hostile.

- Forestry Departments must communicate the results of projects and programmes.

- Forestry Departments must find a way to communicate key strategies and plans to decision makers without offending them.

- Some indicators of success may be intangible such as a change in behavior. For example an indicator of independence and ownership of a project by stakeholders may be less frequent references to outside influences.

- CBOs in the region need to be acknowledged as managers of environmentally important areas and this must be viewed as a success along with the number of areas declared.

- Tangibles, for example policy, create the enabling environment but these need to be used to bring about behaviour change.

- A mix of tangibles and intangibles should be used as indicators.

Boundary Partners

- There is possible gap in the ALG as we have no representation from the Ministries of Planning of the project countries, private sector, community development and the media.

- There needs to be a prioritisation of boundary partners, noting that there is usually a small number of them whose ideas make it into national policy.

- Due care and attention should be utilised when defining boundary partners. For example, how do you define a community? How do issues of capacity influence our determination?

Indicators

- An important indicator in the policy environment in the region right now is built partnerships between CBOs and the Forest Departments. It can be measured by the heads of Forestry Departments knowing the people in the CBOs by first name. This indicates a relationship on which a partnership can be built.

- CBOs expressing a sense of ownership in management arrangements should be considered an indicator.

2.5.6 Debrief

The ALG felt that:
- The session caused you to place yourself in the role of the other partners.
- It was difficult to define what you wanted the partners to do.
- The session caused you to question if it is possible to change the behaviour of boundary partners and if behaviour change is not possible then one must consider ways to work around them.

- Outcome mapping is a useful additional method to the traditional method of developing indicators.
- Outcome mapping seems time consuming.
- Defining the steps can be comforting to new groups.
- Small steps identified can be used as measures of success on the way to achieving milestones.

2.6   Preparatory work for the field trip

The day culminated with a briefing of the field trip (Appendix 8) by Mr. Gordon Patterson and the subsequent division of the ALG into small groups to prepare questions on the following elements of the research framework:

External/ enabling factors: What external factors (social, political, economic, cultural etc) have influenced the type of institutional arrangement? Have these been enabling or challenging?

Institutional arrangements: What are the institutional arrangements and to what extent do they contribute to providing socio-economic benefits for the rural poor?

Capacity: What are the existing capacities (world view, culture, skills and knowledge, financial resources, equipment etc.) of the various actors at the different levels of the institutional arrangement that contribute to the poor deriving socio-economic benefits? What are the gaps?

 Livelihoods: What are the actual and potential livelihood benefits that the community partner organisations are deriving from the arrangement?

All groups agreed to address as a cross-cutting issue the question of how the **sustainability** of the community based partner organisation(s) could be improved.

SECTION 3 – FIELD TRIP

3.1 FIELD TRIP BACKGROUND

The site for the field trip was the Morne Longue (long hill) community, in the parish of St. Andrews on the eastern side of Grenada. The community is approximately 18 miles from the capital St. Georges. Morne Longue is a rural poor community and residents depend mainly on agriculture, hunting and fishing to sustain their livelihoods. The community is located at the lower elevations of "FEDON CAMP".

Fedon Camp is historically significant to Grenada. It dates back to the 16th century when there was a struggle for control of the island. Julian Fedon, a French planter, spearheaded a rebellion against the British in 1795 which lasted for fifteen months. This was one of the longest rebellions in Caribbean history. Fedon had established his camp between the Grand Etang and Belvidere mountains. The surrounding villages of Morne Longue, Belvidere, Clozier, Brothers and Gouyave had a very strong French presence and were used as planning grounds for strikes/attacks against the British. The camp is a major attraction for tourists, visitors and locals.

The camp is divided into three sections. The lower part consisted of estate houses, coffee houses, spice houses etc. The mid section comprised the big parade square which was regarded as "CAMP LIBERTE". The second plateau was considered as "FATERNITY" and the last defensive position was considered as "DEATH". During attacks on the camp the prisoners were moved from the lower level to the top.

The Morne Longue Progressive, a community group in the area, is presently implementing the Morne Longue – Fedon trail development project. The community group - in collaboration with the Grenada Educational Programme (GRENED), the Grenada Board of Tourism (GBT), the United Nation Trust Fund for Human Security (UNTFHS) and the Forestry Department - has embarked on trail development and training of community members in the history, customer service, marketing and first aid.

3.2 PANEL DISCUSSION

After attempting the trail (and only reaching mid-way due to the very rough terrain) the ALG hosted a panel discussion with the community members and their partners. The panel was chaired by ALG member Felix Finisterre and the panelists were:
- Gloria Payne-Bannefield, GRENED;
- A representative of the Grenada Board of Tourism;
- Dr. Curtis Jacob, Historian;
- Arnold Mahon, Morne Longue Progressive;

Panelists were invited to give brief presentations.

3.2.1 Summary of presentations by panelists

Gloria Payne- Bannefield
- Provided background information on GRENED;
- Described GRENEDs role in the Morne Longue – Fedon trail development project;
- Reviewed activities and identified the roles of the different agencies in the Morne Longue – Fedon trail development project.

Representative of the Tourism Board
- Described the scope of activities of the Grenada Tourism Board;
- Responded to questions about the certification from the National Training Agency;
- Noted that the Tourism Policy should address community tourism and that there are models available in the region, for example in Jamaica.

Dr. Curtis Jacob
- Provided an extensive description of the history of the Fedon Camp and responded to questions seeking clarification.

Arnold Mahon
- Provided background information on the community group and the project;

Unfortunately, the session was terminated prematurely because of heavy rains which made hearing the panellists impossible. Groups were asked to present on the following morning at the hotel.

SECTION 4-SUMMARY OF DAY 3

4.1 Group Presentations, messages and lessons

A summary of each group report is presented and messages are below.

4.1.1 External/Enabling Factors

The group is receiving assistance from several external bodies However, it was noted that GRENED is playing a pivotal role in the development of the group and the project.

4.1.2 Institutional Arrangements

The group reported that the Morne Longue Progressive was formed ten years ago in response to community perceived and recognised needs. At present, they have a structure but are not registered and do not have a bank account. They currently rely heavily on their external partners to provide much needed support.

4.1.3 Capacity

The group highlighted the fact that Morne Longue Progressive had the cohesiveness and unity of vision which when coupled with the skills of their partners would lead to successful implementation of the project.

4.1.4 Livelihoods

The group compiled a comprehensive list on the livelihood assets within the community. The list specifically noted a current estranged relationship with key government officials and acknowledged the role that current partners, such as GRENED, play in the sustainability of the outcomes of the present project.

4.2 Lessons

ALG members put forward the following as lessons from the field trip.
- Building capacity is important for sustainability.
- GRENED has an important role as a mentor, but consideration should be given to how they will disengage from Morne Longue Progressive.
- History and culture can be a powerful inspiration for communities.
- GREP is a catalyst.
- Community needs should be drawn from the people in the community.

- Morne Longue Progressive has been together for ten years and has demonstrated an enthusiasm and energy which has drawn younger people to the group.
- Land managers are important stakeholders and should be drawn into development planning at the initial stages.
- It is important to bring all key stakeholders in a project together.

Key Lessons:
- The research process seems to be putting words into their mouths.
- "Clientelism vs Empowerment". That is, there needs to be a balance between mentorship and building the capacity of CBOs.
- It is important when facilitating a process that attention is paid to acknowledging differences and building consensus.
- In switching livelihood strategies there is often a financial gap.
- Involving communities in monitoring and evaluation can help to bring tangible livelihood benefits, inclusive of economic benefits.
- Build capacity in the community that allows the people in the community to contribute meaningfully to transforming their community

4.3 Recommendations for the Forestry Division

- Involve the Ministry of Finance and other funding agencies (for example the Basic Needs Trust Fund) in the project.
- Consideration should be given to selling the project as a poverty alleviation initiative to other funding agencies.
- The trail needs further improvement.
- Morne Longue Progressive needs ongoing support to build its capacity.
- The trail should be put on the local market.
- Do a market and feasibility assessment of the project.
- Derive a carrying capacity for the trail.
- Get archaeological studies done on the site.
- Translate information for interpretation by community members to help community members build ownership and ties to the project.
- Support the development of small businesses, for example accommodation and food services, to compliment the tour of the trail.
- Need to link with other communities to develop synergies with other tourism products offered and to maximise the effect of market strategies.
- A request should be made to Community Development to address some of the underlying capacity issues of Morne Longue.
- Give the group a chance to start managing money to learn good financial management.
- The church should be brought in as a partner in the project to assist with community development.
- There is a need to understand the roots/history of the people in the Morne Longue community.
- Register Morne Longue Progressive and build on the existing governance arrangements.
- Seek written permission from land owners to use the land over which the trail extends.

- Encourage other government departments with responsibility for utilities to implement basic services such as electricity, water, phone and transportation in the area.

4.4 Refining the Communication Strategy

A plenary session focused on identified the pathways for the following target audiences.

Senior Forest Officers:
- Field visits
- Face –to-face meetings
- Presentations from champions

CBOs:
- Face-to-face stories and visual presentations
- Emails
- Websites
- Dramatic presentations

NGOs:
- Emails
- Telephone conversations
- Routine face-to-face meetings
- Brochures and bulletins

Ministers:
- One minute opportunistic speeches
- Department heads influencing the budgeting process
- Public fora for example opening ceremonies
- Donors during administration of funds

4.5 ALG Members sharing on plans/opportunities to disseminate learning and publicise project findings

Respective ALG members identified the following.
Milton Lawrence
- Still looking for the right opportunity to get indigenous banks in the region to invest in forestry and forest-based livelihoods as part of their corporate responsibility strategy.
- Find some time to work with one group in Dominica, St. Kitts or Nevis.

Bernard Blue
- To share information with the team.
- Reported he is part of a team regarding considerations to be given including alternative livelihoods in protected areas management in Jamaica.
- To promote the inclusions/development of a list of criteria for measuring success in management and evaluation of projects.

Noel Bennett
- Reminded the meeting that he coordinated the first exchange visit between LFMCs in Jamaica.
- Committed to promote the model from the first LFMC as an annual event - LFMC conference.

Dr. Laverne Ragster
- Committed to supporting and promoting the urban forestry project on UWI campuses in St. Thomas and St. Croix.

Neemedass Chandool
- Committed to teaching the importance of community participation in natural resource management.
- Plans on conducting research and working with students on final year projects on natural resource management.

4.5 Next steps for CANARI

Neila Bobb-Prescott delivered a brief summary of plans for the May 2010 Forest Conference, "Forest for People, People for Forest: Forest-based Livelihoods in the Caribbean" which stimulated comments from the ALG which endorsed the approach developed so far. ALG members further committed to assume various roles in the conference.
ALG members were also invited to assist in deciding on themes, locations and facilitators for the remaining EU funded exchange visits. However, at this time the group may have been saturated and instead spoke about issues at the hotel.

4.6 Future ideas for projects

On the first day of the meeting ALG members were invited to place suggestions for future projects ideas on a designated area on the wall. The following is a listing of items proposed.
- Forest and environment training manual for the Caribbean that is targeted at CBOs and students
- Involve OECS and CARICOM in future ALGs
- Participatory preparation of local forest management plans
- Measuring success as changes in ecosystems
- Draft projects that encourage the use of new and developing technologies for example BIOCHAR
- Draft projects that encourage the use of bamboo, honey and mushroom cultivation at high altitudes
- More care should be put into selecting case studies

4.7 Evaluation

Daily verbal evaluations were done and a final written evaluation was completed by the ALG. The verbal evaluations were generally favourable with the final one indicating that the members

were saturated. The written evaluations supported this analysis as they indicated that the content of the sessions were valuable, but a significant number of the ALG indicated that they thought that the itinerary was very dense.

Appendix 1- Forest and Livelihoods ALG Concept Note.

<u>**Working Document for Forests and Livelihoods Action Learning Group (ALG)**</u>

Forests & Livelihoods Action Learning Group Concept Note

Caribbean Natural Resources Institute (CANARI)

1. **Context**

The focus of the development community in Caribbean Small Island Developing States (SIDS) currently revolves primarily around the Millennium Development Goals (MDGs) and the need for adaptation to climate change, yet paradoxically little attention is being paid to the critical role of forests in contributing to these objectives. National Poverty Reduction Strategy Papers (PRSPs) rarely reflect the contribution of forests to human well-being, either in terms of environmental services or the goods on which many people depend for food, medicine and revenue generation. Similarly, while practice on the ground is changing, formal forest policy in most countries has not been reviewed or revised to reflect the actual or potential role of forests in ensuring environmental sustainability (MDG7) or contributing to livelihoods.

However, the need to explore and optimise the linkages between forests and livelihoods is evident. Rural poverty has increased in many Caribbean SIDS as a result of the decline of the banana and sugar industries. While tourism is being advanced as the main economic alternative, it also contributes to an increased demand for the services provided by forests, notably water. Predicted

climate change trends in the region, such as sea level rise and, in the Greater Antilles, drier rainy seasons, make it all the more pressing to develop interlinked sustainable forest management and rural livelihood strategies.

Implementation of strategies to manage forest goods and services for development of sustainable rural livelihoods must take place in an institutional context that facilitates integrated and cross-sectoral policy making, planning and management. However, forest management institutions in Caribbean SIDS remain for the most part both highly centralised and isolated.   Links to policy and decision-makers in cross-cutting areas such as rural development, entrepreneurial development and poverty alleviation remain weak and there are few examples of integrated planning to address the increasing and competing demands on the forest resources, for example for tourism and residential development.

There is also a need for more systematic evaluation and documentation of the socio-economic impacts of various forest management strategies. For example, most participatory forest management schemes are premised on the assumption that this will provide benefits for the communities and community members involved, yet few quantify their socio-economic objectives so there is little other than anecdotal evidence to support this.

2.   Forests and Livelihoods Programme

The **vision** of CANARI's *Forests and Livelihoods* programme is:

> *Optimised contribution of forest goods and ecological services to sustainable livelihoods of the rural poor in Caribbean SIDS.*

The overall **goal** of the programme is:

> *To identify, analyse, promote, and build capacity at the regional, national and local levels for institutional arrangements and management of forest resources which ensure the sustainable use of forest resources and optimise the socio-economic contribution of forest resources to the rural poor of the insular Caribbean.*

The programme focuses on research and capacity building activities designed to maximise the contribution of forests to improving the quality of life of poor people in rural communities in Caribbean islands. The programme looks at the contribution of forests in terms of both 'forest goods' (e.g. timber, craft materials, medicinal plants) and 'ecological services' (e.g. preventing soil erosion, contributing to improved water quantity and quality, providing landscape beauty). The programme's definition of livelihoods also goes beyond just the ability for people to earn money from forest resources (although this is important) to include other aspects of quality of life including individual's and community's access to a range of other important assets – natural, social, human and physical (for example a clean environment, basic social services and infrastructure, opportunities for recreation and relaxation).

There are currently two main projects under this programme to which others will be added as research gaps or opportunities are identified:

- A regional project on ***"Practices and policies that improve forest management and the livelihoods of the rural poor in the insular Caribbean"*** funded by the European Commission's Programme on Tropical Forests and other Forests in Developing Countries [2007-2009]. The project is being conducted in the following countries: Barbados,

Commonwealth of Dominica, Grenada, Jamaica, Saint Christopher (St. Kitts) & Nevis, Saint Lucia, Saint Vincent & the Grenadines, and Trinidad & Tobago.

- A regional project entitled "***Participatory Forest Management: Improving policy and institutional capacity for development***" [2006-2008]. This project is being implemented in partnership with the forestry departments of the project countries, with funding support from the Food and Agriculture Organization of the United Nations (FAO) through its National Forest Programme Facility (NFPF). The project is being conducted in the following countries: Barbados, Commonwealth of Dominica, Grenada, Saint Christopher (St. Kitts) & Nevis, Saint Lucia, Saint Vincent & the Grenadines, and Trinidad & Tobago. Jamaica, which has its own NFPF project, is participating in and contributing to regional activities.

3. Purpose of the Action Learning Group

The multi-sectoral regional Action Learning Group (ALG) on Forests and Livelihoods is a mechanism established under the EC-funded project on ***"Practices and policies that improve forest management and the livelihoods of the rural poor in the insular Caribbean*** that will be applied to CANARI's entire ***Forests and Livelihoods*** programme.

ALG members will collectively analyse project findings and will also play an important role as catalysts for change in their respective countries and in the region through dissemination of project findings to their organisations and institutions. This will be the core group from which a shared understanding will develop across the region on institutional arrangements (policies, practices, legislation, structures, etc.) approaches that optimise the socio-economic benefits to rural poor from forests.

4. Objectives of the Action Learning Group

The ALG will:

- validate, analyse and distill learning on institutional arrangements (policies, practices, legislation, structures, approaches, etc.) that optimise the socio-economic benefits to rural poor from forests from the findings of the EC, FAO project and any other relevant projects in the region, whether implemented by CANARI or other members of the ALG;

- disseminate, advise on dissemination and apply where appropriate learning on institutional arrangements (policies, practices, legislation, structures, approaches, etc.) that optimise the socio-economic benefits to rural poor from forests to their organisations and institutions

5. Composition of the Action Learning Group

The multi-sectoral Action Learning Group comprises individuals from key national and regional institutions who can contribute skills, knowledge or experience to research and capacity building on forests and livelihoods and who are in a position to serve as "change agents" by sharing learning on project findings within their countries, institutions and sectors. The group contains representation from government, private sector and civil society, including forest users, from the forestry and poverty reduction and rural livelihoods sectors and other relevant sectors (e.g. tourism, agriculture) in the 8 core countries that have been selected as the focus of this project, as well as representatives of relevant regional organisations and technical and financial support agencies.

The strength of the ALG will lie in its independence, range of experience, non-bureaucratic and participatory approach, and the participation of motivated people who can disseminate learning and shape opinion. Action Learning Group members are therefore invited primarily in their individual capacity.

6. Roles and responsibilities

ALG members shall:

a) attend twice-yearly ALG meetings and participate in other ALG communications (e.g. via e-mail);

b) participate in other project activities such as development of promotional materials and the training workshops;

c) review and contribute to the analysis of the findings of projects under CANARI's **Forests and Livelihoods** programme, including joint and cross sectoral analysis of forest management issues identified;

d) assist with the identification of other research or capacity building needs in relation to forests and livelihoods;

e) disseminate, shape opinion and apply project learning and identify opportunities for linkages and dissemination of learning within their own sector, country, or regional or international initiatives in which they are involved, to include:

- assisting with the formulation of strategies to help society to recognise the important contribution of forests to the quality of life;

- contributing to catalysing and facilitating consensus building on participatory forest management among participating countries;

- applying lessons learnt about participatory management practices to build on efforts in individual countries;.

CANARI shall:

a) facilitate twice-yearly ALG meetings and other ALG communications (e.g. via e-mail);

b) lead on and facilitate participation of ALG members in development, implementation , monitoring and evaluation of projects under the **Forests and** Livelihoods programme;

c) lead on and facilitate participation of ALG members in analysis of the findings of projects under CANARI's **Forests and Livelihoods** programme;

d) lead on and facilitate participation of ALG members with the identification of other research or capacity building needs in relation to forests and livelihoods;

e) develop communication products for dissemination, including by ALG members;

f) lead on and facilitate participation of ALG members in dissemination of learning within sectors, countries, and regional or international initiatives.

7. Process of Action Learning

The ALG will function through a range of individual and collective actions (e.g. semi-annual meetings, phone and email communications, and utilisation of a project website as a means of information exchange).

The action learning process is being used because it can facilitate:

- addressing problems and issues that are complex and cannot be easily resolved;

- finding solutions to underlying root causes of problems;

- determining new policy and strategic directions or to maximise new opportunities;

- generating creative ideas.

The action learning process is characterised by:

- acquisition of relevant knowledge;

- experiential learning;

- collaborative learning in groups;

- creative complex problem solving.

Appendix 2 – MEETING AGENDA
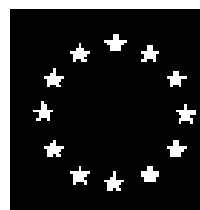
Forests and Livelihoods Action Learning Group Meeting
The Flamboyant Hotel & Villas, St. George's, Grenada
October 5-7, 2009

 AGENDA

Monday 5th October

8:00 a.m.	Opening, welcome and introductions Allocation of roles for the meeting	Neila Bobb-Prescott
8:45 a.m.	Objectives and overview of meeting Brief review of project objectives , purpose of ALG, and recap of third ALG meeting in St Lucia Brief update on programme activities: • Action learning projects • Small grant programme for CBOs • Exchange visits • National workshops • Case studies • Climate Change and forest-based livelihoods Introduction to focus on identifying priority needs for next projects	Neila Bobb-Prescott/ Nicole Leotaud
9:30 a.m.	Review of roles of ALG members Sharing on what has been learnt and done by ALG members to apply learning on institutional arrangements that optimise socio-economic benefits from forests to the rural poor	Nicole Leotaud
10:00 a.m.	BREAK	
10:30 a.m.	Monitoring and Evaluation • Introduction to M&E • Defining "results" for the Forests and Livelihoods programme • Small group work to start to define results	Nicole Leotaud
1.00 p.m.	LUNCH	
2:00 p.m.	Small group feedback and plenary discussion	Nicole Leotaud
3:00 p.m.	Climate Change and forest-based livelihoods	Neila Bobb-Prescott

4:15 p.m.	Introduction to field trip case study and the wider institutional framework	Gordon Patterson
	Orientation and small group preparation for field trip and allocation of leaders for small group work	Neila Bobb-Prescott
5:00 p.m.	Close	

6:30 p.m. Cocktail reception at Flamboyant Hotel
Tuesday 6th October

8:00 a.m.	Review of Day 1	Rapporteur
9:00 a.m.	Field trip to Morne Longue hosted by Morne Longue Community Development Group • Introductions • Outline to local stakeholders the purpose of the visit • Walk part of the trail	Gordon Patterson
12:00 p.m.	LUNCH	
1:00 p.m.	Panel discussion on evolution of the initiative	Panel, chaired by Felix Finisterre
2:00 p.m.	Small group work to analyse lessons from Morne Longue experience (ALG members and national and local stakeholders) Small group presentations and plenary discussion	Nicole Leotaud
3:30 p.m.	Summary, thanks and close	Neila Bobb-Prescott
5.30 p.m.	Return to Flamboyant, St. George's.	

Wednesday 13th October

8:00 a.m.	Review of field trip and overall analysis of lessons learned	Rapporteur/ Neila Bobb-Prescott
9:00 a.m.	Refining the communication strategy • Presentation of framework, with messages and target audiences identified • Review and discussion on World Forest Congress Paper	Nicole Leotaud
10:30 a.m.	BREAK	
11:00 a.m.	Small group work to discuss and analyse lessons learnt on: • action learning projects/mentoring • case studies • national workshops • small grant programme for CBOs Small group feedback and plenary discussion Identification of priority communication products under the EU project	Nicole Leotaud
1:00 p.m.	LUNCH	
2:00 p.m.	Next steps for CANARI • Regional Conference May 2010 and role of ALG • Exchange visits • Other?	Neila Bobb-Prescott
2:30 p.m.	Review of priority needs to address in follow-up projects	Neila Bobb-Prescott/

		Nicole Leotaud
3:30 p.m.	ALG Members share their plans/opportunities to disseminate learning and other opportunities to publicise project findings	Neila Bobb-Prescott
4:00 p.m.	Evaluation	Nicole Leotaud
4:30 p.m.	Close	Neila Bobb-Prescott

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Appendix 4 – OPENING SESSION PRESENTATION

*Forest &
Livelihoods Action
Learning Group
Meeting*

In collaboration with the Ministry of Agriculture, Lands, Forestry and Fisheries
**Flamboyant Hotel,
St. George's ,Grenada.**

**Purpose & Overview
of meeting**

Overall Purpose

- validate, analyse and distill learning on institutional arrangements that optimise the socio-economic benefits to rural poor from forests from the findings of the EC, FAO project and any other relevant projects in the region.

- disseminate, advise on dissemination and apply where appropriate learning on institutional arrangements that optimise the socio-economic benefits to rural poor from forests to their organisations and institutions

Objectives

- To **share experiences and findings** of the EC, FAO project and any other relevant projects and initiatives in the region on using forests for socio-economic benefits, whether implemented by CANARI or other members of the ALG;

- To **analyse information** from the presentations, reports, discussion and field trip and **extract lessons** on institutional arrangements that optimise the socio-economic benefits to the rural poor from forests;

- To assess what change, if any, there has been in the project countries to develop institutional arrangements that optimise the socio-economic benefits to the rural poor from forests;

- To make **recommendations regarding the implementation** of existing projects under the *Forests and Livelihoods* programme;

- To **identify specific actions that ALG members will take to disseminate learning** in their role as change agents;

- To identify **priority needs** for development of new projects.

Review of ALG 4

Photos courtesy Robyn Cross

Focus

- Analysing findings ALPs and case studies

- Building capacity of ALG members in communication

- Refining the small Grants Programme.

Communication

- Messages included:

*Politicise" your message but be cautious about partisan politics **…targeted at Change Agents, CANARI***

6/10/2010

Start up NGOs/ CBOs need systematic accompaniment over a longer period than the typical project time frame, including skills/ capacities that may not reside in the partner or government agency …targeted at Government agencies and donors

Field Trip

- Gros Piton Trail

- Lessons identified included :
"Forestry can better manage natural resources when people are better managed."

Any thing else……………………...

Photos courtesy Howard Nelson

Update on the project

Forests & Livelihoods Programme

To improve livelihoods and contribute to poverty reduction by promoting and facilitating sustainable use and management of forests, building effective institutions and facilitating collaboration between key stakeholders, using participatory action research, capacity building, and promoting use of lessons learned."

Charcoal pit in Saint Lucia

European Commission (EC)	FAO National Forest Programme Facility
"Practices and policies that improve forest management and the livelihoods of the rural poor in the insular Caribbean"	"Participatory Forest Management: Improving policy and institutional capacity for development"
2007-2009	2006-2010

Project countries

1. Dominica
2. Grenada
3. St. Kitts and Nevis
4. Saint Lucia
5. St. Vincent & the Grenadines
6. Trinidad & Tobago
7. Jamaica

Mountains of St. Vincent Credit: Fitz Providence

FAO project activities

- Country reviews of PFM
- Regional workshop on PFM
- Regional forest policy review
- Concept notes for national forest policies
- Training of Trainers
- 4 Action Learning Projects
- Country training workshops
- Small grants programme for NGOs and CBOs
- Regional conference

Sundew Tourguiding Services
Aripo Savannas Scientific Reserv
Trinidad
ALP recipient

EU project activities

- Review of status of forest policy & institutions
- Action Learning Group (ALG)
- Case studies to quantify socio-economic benefits derived by rural poor from a range of forest management arrangements
- Development and dissemination of recommendations for forest institutional arrangements that optimise socio-economic benefits to rural poor
- 8 exchange visits
- Regional conference

Action Learning Group
Bon Aire community visit
Trinidad

Other Programme Activities

- CARUTA project

- GEO project

Forest and Livelihoods Regional Conference

May 11-14, 2010
Trinidad.

"Forests for People, People for Forests:
Forest-based livelihoods in the Caribbean"

Goal

To identify and promote policies and practices that support sustainable forest-based livelihoods in the islands of the Caribbean based on sharing of stories, experiences and lessons learned.

Programme Overview

- pre-conference one-day workshop for CBOs

- two days of meetings and one day of field trips
  (Each theme will be introduced via a plenary session, followed by a set of simultaneous breakout sessions, and wrapped up with a concluding plenary)

- a high-level session for policy-makers

- poster exhibition

Themes

Adaptive, collaborative, ecosystem-based approaches in forest management

- What is the right scale for forest management planning? How can cross-scale management be achieved?

- How can management of the range of state forests be coordinated?

- How can management of private forests be facilitated and coordinated across ownerships and landscapes?

Opportunities for forest-based livelihoods from abandoned agricultural estates

- What can be done in land use planning to facilitate effective use of abandoned agricultural land?
- What are the tenurial issues and potential common property or other arrangements?
- How can agricultural, forestry, tourism, and other sectors work together to take advantage of this opportunity to work towards economic and social development and poverty alleviation?

Forests for poverty alleviation

- What have been experiences of Caribbean communities and their partners with developing forest-based livelihoods?
- What policies, laws and structures need to be in place to enable sustainable forest-based livelihoods?
- Are forests providing key opportunities in poverty reduction strategies and programmes?

Valuation of ecosystem services and its role in forest management

- What do we know about the value of forest goods and services in the Caribbean?

- What are the issues in forest valuation in small Caribbean islands? What are some lessons about appropriate valuation methods?

- What are sustainable financing options for forest management?

Climate change and forests in small islands

- What responses are needed at the policy level and on the ground to adapt to these changes?

- What is currently being done in the Caribbean to address these challenges?

What role do you see for your self at this regional conference ?

Thank you

- Any questions ???

Appendix 5- LAND COVER PROJECT PRESENTATTION

Land cover data for Barbados
Source
USGS, IITF and US AID
Caribbean program office

show map

Barbados land cover

Land cover / Vegetation Type	ha	%
Urban and build up areas	9211	21
Sugar cane (including root crops)	11706	27
Intensive Agriculture	1692	4
Mixed and woody agriculture	248	1
Inactive agriculture (former cane)	**8768**	**20**
Pasture and other grassy areas	2471	6
Golf course	308	1
Forest and open woodlands	7434	17
Barren land	1447	3
Wetland and water	66	0
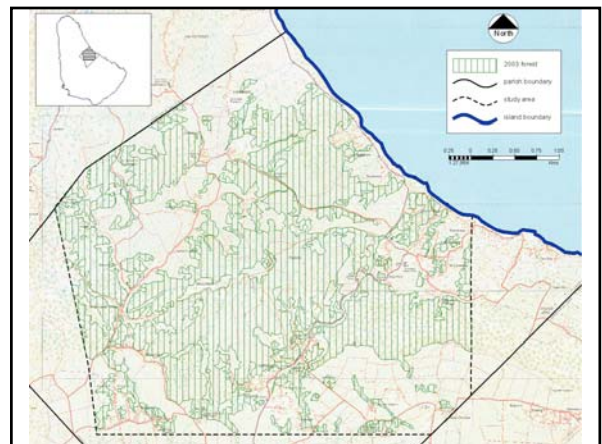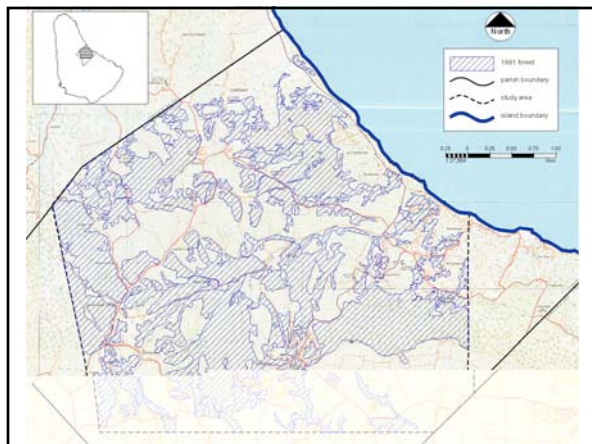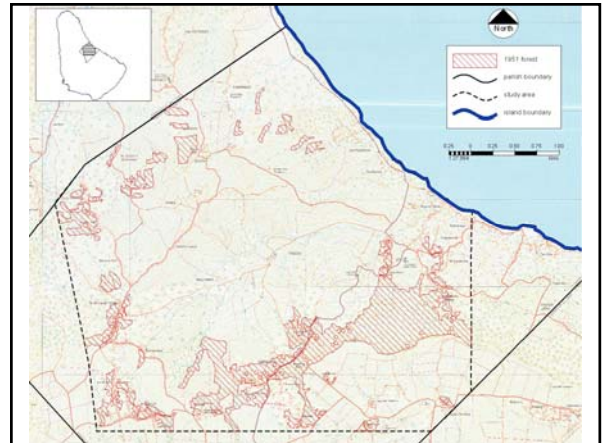
Increase of forest cover
in a 1600 ha study area in Barbados (east coast)
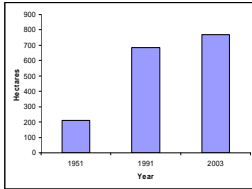
- **percentage of study area under forest**

- 1951   12.1 %
- 1991   42.6 %
- 2003   47.8 %

Land cover data for Grenada
Source
USGS, IITF and US AID
Caribbean program office

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show map

Grenada land cover

Land cover / Vegetation Type	ha	%
Urban and build up areas	2747	9
Sugar cane (included in minor crops)	-	-
Intensive Agriculture (minor crops)	332	1
Mixed and woody agriculture	9453	30
Inactive agriculture	**2343**	**7**
Pasture and other grassy areas	2471	6
Golf course	12	0
Forest and open woodlands	15845	51
Barren land	330	1
Wetland and water	278	1

Distributions of land cover and forest formations for St. Kitts, Nevis, St. Eustatius, Grenada and Barbados from satellite imagery

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Abstract

Satellite image-based mapping of tropical forests is vital to conservation planning. Standard methods for automated image classification, however, limit classification detail in complex tropical landscapes. In this study, we first test an approach to image interpretation for mapping forest formations and land-cover on four islands of the Lesser Antilles. Secondly, we estimate the extents of land cover and protected forest by formation for five islands and examine whether cultivated areas or forest cover changed over the second half of the 20th century. The image interpretation approach stacks image mosaics with ancillary geographic data, classifying the resulting stack of raster data with decision tree software. Cloud-free image mosaics for one or two seasons were created by applying regression tree normalization to alternate scene dates to fill cloudy areas in a base scene. The approach accurately distinguished several classes that would be confused with more standard methods; the seamless mosaics aided reference data collection; and the multiseason imagery allowed us to separate drought deciduous forests and woodlands from semi-deciduous ones.

Cultivated land areas declined 60 to 100 percent from about 1945 to 2000 on several islands. Meanwhile, forest cover has increased 50 to 950%. Unless sugar cane cultivation becomes more profitable and competitive on the islands where it previously dominated agriculture, this trend will likely continue. Like the island of Puerto Rico, most higher-elevation forest formations are protected in formal or informal reserves. Lowland forests, however, which are drier forest types on these islands, are not well represented in reserves. Former cultivated lands in lowland areas could provide lands for new forest conservation reserves of drier forest types. The land-use history of these islands may provide insight for planners in countries currently considering lowland forest clearing for agriculture.

INTRODUCTION

Gaps in the global network of conservation reserves are mostly in montane and insular tropical landscapes, where species endemism is high (Rodrigues et al. 2004). The need to expand reserve networks on tropical islands is particularly urgent (Myers et al. 2000; Rodrigues et al. 2004). Habitat losses are often extensive, and land development pressures can be large. Conservation

planning often starts by mapping habitats with Landsat satellite imagery (Scott et al. 1993). These maps can then support simple to complex assessments of reserve networks. Simple "representativeness" assessments, for example, estimate the extent of each forest formation or ecological zone that is under protection. Such initial assessments have provided timely data to planners on whether conservation reserve networks may under represent some ecosystems (Powell et al. 2000; Helmer et al. 2002; Helmer 2004). Data for these simple assessments, however, are often unavailable or outdated. One reason is that standard methods for automated satellite image interpretation are not effective for detailed mapping of land cover and forest formations in montane and insular tropical landscapes. Complications include steep environmental gradients, spectral confusion between land-cover classes, and persistent cloud cover. Consequently, mapping these complex landscapes with satellite imagery is a subject of research. Methods that work well in one landscape may not distinguish classes that are important in another one.

The first objective of this study is to test an approach to satellite image interpretation for mapping forest formations and land cover over two study areas in the Caribbean, including Grenada and St. Kitts, Nevis and St. Eustatius. The approach uses decision trees to classify a stack of digital raster data that includes both Landsat satellite image bands and other geospatial data. The approach also relies on image mosaics. In the mosaics, alternate scene dates fill cloudy areas in a base scene after undergoing regression tree normalization. In addition, the approach uses imagery from each of two seasons to identify drought deciduous woody formations. While decision tree classification is becoming common in remote sensing, only one other example uses decision trees for detailed forest mapping in a tropical island setting (Kennaway and Helmer, unpublished data). The land-cover types and forest formations present on these islands include ones that earlier work has collapsed, delineated by hand, or not encountered.

The second objective of this study is to better understand the extent to which the reserve systems or informal reserves of the above four islands, as well as the informal reserves of Barbados, represent different forest formations. We also ask whether cultivated land areas have declined on these islands over the last half-century. Earlier work on the Caribbean island of Puerto Rico shows that the extents of protected lowland forest formations can be small (Helmer et al. 2002). Cultivated land area has declined in Puerto Rico, which may mean that more land is available for setting aside conservation reserves in lowland areas. These same areas, however, are where most of the land-cover change to urban or built-up land occurs (Helmer 2004). The trends in Puerto Rico could also occur on the islands in this study. However, recent and detailed land-cover data have not been available to quantify the extent to which reserves include different forest formations.

METHODS

Overview
To accomplish our first goal, we used decision tree software to classify Landsat image mosaics over two study areas: one area included St. Kitts, Nevis and St. Eustatius, and the other area was the island of Grenada. In the classifications, we stacked ancillary raster data, like topographic variables, with the Landsat image bands. The Landsat imagery included one image mosaic and

one image for Grenada, and two image mosaics for the St. Kitts study area. The image mosaics were developed by applying regression trees to normalize images from other dates to fill clouds in a base scene for each mosaic. We then assessed accuracy of the Landsat image classifications with 1-m pan-sharpened, false color IKONOS imagery dated from 2000-2003. For the few remaining cloudy areas, we manually interpreted forest formations and land cover from the IKONOS imagery.

To complete the second goal, we first mapped forest formations and land cover for Barbados by manually interpreting 1-m pan-sharpened, true color IKONOS imagery, circa 2000. Much of Barbados was cloud-obscured in all available Landsat imagery. Also, because we did not have multiseason imagery for Barbados, some forest formations were generalized. Secondly, we quantified the extents of protected forest by formation for all five of the islands. For Grenada, Barbados and St. Eustatius, we used a protected area database for the insular Caribbean produced by The Nature Conservancy. The primary source for protected areas was the World Database on Protected Areas (WDPA-Consortium 2003), which was enhanced using country-scale protected area information (TNC 2007). All of the Barbados protected areas in the database are only informally protected. A 1000-ft contour provided boundaries for protected lands on St. Kitts and Nevis, because development is prohibited above that elevation. We also manually digitized boundaries for Brimstone Hill National Park, in St. Kitts, from IKONOS imagery. Finally, we assessed whether changes in cultivated land or forest areas have occurred over the last half-century by comparing areas of cultivated lands and other land-cover types from the maps with area estimates from a table published in Beard (1949). Beard (1949) extensively surveyed several islands of the Lesser Antilles from 1942 to 1946. He inventoried the species composition of and mapped forest types, and he estimated the areas of different forest types, pasture and grazed woodlands, cultivated lands and "other uncultivated" lands (towns, villages, sand dunes, salt flats). We only present comparisons based on the tabular results in that publication, because the scale of the maps published in Beard (1949) is too coarse for change detection within a geographic information system.

Study areas

The Caribbean Leeward islands of St. Kitts, Nevis, and St. Eustatius, and the Windward islands of Grenada and Barbados, are part of the Lesser Antilles. The climate and woody vegetation formations on the islands are subtropical or tropical, and they range from xeric forests and shrublands to semi-deciduous, seasonal evergreen or evergreen forests including cloud forests. Volcanic geology dominates four of the islands, which each have one or more mountains of volcanic origin. Elevations on the volcanic islands range from just below sea level in some wetlands to 600 m on St. Eustatius, 1156 m on St. Kitts, 985 m on Nevis, and 840 m on Grenada. Karst substrates dominate most of Barbados, which has elevations that range to 336 m and a more restricted range of vegetation formations.

Classification scheme

As in Helmer et al. (2002), the forest and shrubland classes are designated to the formation level (Table 1). Formations are adapted from Areces-Malea et al. (1999), who classify Caribbean vegetation according to standards of the US Federal Geographic Data Committee (FGDC, 1997). Mapping forests to the formation level is practical for satellite image classification in these landscapes when plot-level floristic data are not available (Helmer et al. 2002). Image spectra or

geospatial environmental data can usually distinguish woody formations because environmental and physiognomic factors, like leaf phenology, largely define them.

In the FGDC standards for subtropical or tropical woody vegetation, *drought deciduous* refers to woody vegetation formations in which at least 75% of woody canopy species are deciduous. *Semi-deciduous* means that most upper canopy trees are drought deciduous and many understory trees and shrubs are evergreen, but the evergreen and deciduous woody plants are not always separated by layers. This definition overlaps with the FGDC definition for *semi-evergreen*, in which 25 to 75% of canopy tree species are deciduous. To avoid confusion, we use only the term *semi-deciduous* (after Areces-Mallea et al. 1999), and we use it for stands with 25 to 75% of deciduous woody canopy species. *Mixed* refers to mixed evergreen and deciduous cover that includes trees or shrubs at maturity, as in Areces-Malea et al. (1999). At least 75% of *seasonal evergreen* and *evergreen* canopy species are evergreen. In seasonal evergreen formations, some canopy species drop some leaves during drought.

Forest includes lands with at least 25% tree or tree plus shrub cover, combining the two forest successional stages of Helmer et al (2002). The one case in which we distinguish the younger *forest/shrub* class is where young stands are drought deciduous but adjacent older forest is semi-deciduous (*forest/shrub* includes lands with 25-60% tree plus shrub cover, or ≥60% cover of uniformly young seedlings or saplings that may include shrubs). This definition of forest differs from the FGDC standards and Areces-Malea et al. (1999), which call lands with 25-60% tree cover woodlands. As in Helmer et al. (2002), we reserve the term woodland for lands with >25% canopy cover of drought deciduous shrubs or trees, which are often leguminous and thorny, and a clear understory that fire and grazing maintain and that may include grasses or forbs. If these disturbances cease, drought deciduous woodlands may succeed to drought deciduous forest/shrub, which legumes often also dominate, and they may eventually succeed to semi-deciduous or mixed formations. In the map legends we generalized the driest coastal forest and shrubland formations into one class. With the exception of large patches of *Coccoloba uvifera* on St. Kitts, most patches of coastal evergreen forest were too small to be distinct from the matrix of drought deciduous and mixed formations. In addition, in Barbados, the class deciduous, evergreen coastal and mixed forest or shrubland (with or without succulents), also includes a mosaic of drought deciduous, semi-deciduous and seasonal evergreen forest/shrub below and to the northeast of Mt. Hillaby.

Landsat imagery

Even the clearest Landsat images for each study area still had many clouds obstructing land. Consequently, we used a regression tree method (Helmer and Ruefenacht 2005) to make nearly cloud-free image mosaics. The base or *reference* image for each mosaic is usually the clearest one available for the season of interest. The *subject* images are other image dates that are cloud-free where the reference image is cloudy. The regression tree method normalizes subject images to the reference image for each mosaic. The normalization minimizes atmospheric, phenological and illumination differences between the various image dates that form each mosaic. As the new subject image data are calibrated to the reference image for each mosaic with regression tree models, they more seamlessly fill cloudy areas in the reference image. Details on the method are available in Helmer and Ruefenacht (2005). Most of the Landsat scenes were terrain-corrected, Landsat 7 Enhanced Thematic Mapper (ETM+) images (Table 2). We also used two ETM+

images over the St. Kitts area and one Landsat 5 image over Grenada that were not terrain-corrected. All images were co-registered, to within <1 pixel root mean square error, to the clearest terrain-corrected image for each study area.

We made two image mosaics for the St. Kitts study area, including one mosaic for each of two stages of phenology for drought deciduous woody vegetation (Table 2). Drought deciduous woody vegetation was "leaf-on" in the base scene for the mosaic from the beginning of the dry season. Drought deciduous woody vegetation was in a "leaf-off" state in the base image for the other. We made one leaf-on image mosaic for Grenada. In addition to ETM+ scenes, the Landsat 5 image for Grenada provided relatively cloud-free imagery at high elevations where the reference ETM+ scene was cloudy. At lower elevations in the Landsat 5 image for Grenada, drought deciduous forest was in a leaf-off state. Consequently, we also included this image as a leaf-off image in the classification.

Landsat image classifications

We evaluated whether the decision tree software See5 (http://www.rulequest.com) could effectively classify Landsat imagery in these types of landscapes. We expected decision trees to have two advantages for the classifications. First, decision tree classifiers accommodate spectrally heterogeneous classes. As long as training data represent class spectral variability, decision trees can accommodate some class spectral variability (Friedl and Brodley 1997), which might come, for example, from the different image dates that compose an image mosaic. Secondly, decision trees can handle many discrete and continuous predictor variables, separating spectrally similar forest types with variables like rainfall or topographic derivatives (Strahler 1981; Skidmore 1989). When using decision trees to classify stacks of image bands and ancillary data, the decision tree software determines which of several image bands and ancillary layers most accurately distinguish classes based on reference, or *training* data. They quickly identify complex relationships between variables and apply them in a classification model. Consequently, ancillary data can include correlated variables. The models that result are often complex. However, complex models are appropriate when the goal of a classification is accuracy rather than to characterize the relationships between the classes and the spectral or ancillary data. With decision tree classification, the spectral and auxiliary predictor variables extracted from training data locations are used to parameterize the decision tree model. The spatial distribution of different forest types classified by the decision tree is on a per-pixel basis.

Training data for each classification consisted of 25 to >100 multipixel patches distributed throughout the extent of each class, which resulted in a dense training dataset with thousands of training pixels per class. The data included field-based training data for St. Kitts, Nevis, and Grenada that was collected between January and June 2003. Field data collection relied on simultaneously observing land cover and forest formation both in satellite imagery and in the field. In the field we integrated a Global Positioning System (GPS) receiver with a laptop computer (with a daylight-viewable image display) running the ERDAS Imagine GPS tool (Leica-Geosystems, 2003). To distribute training data throughout the extent of each class, we then supplemented these field data by visually interpreting pan-sharpened, 1-m false color or true color IKONOS images. The IKONOS imagery was from the years 2000-2001 for St. Kitts and Nevis, and from 2003 for Grenada. Dated between October and February, drought deciduous woody vegetation was in a leaf-on stage in the IKONOS. Field work in St. Kitts and Nevis

included traversing elevation gradients in eight different locations on windward and leeward sides of these islands. This extensive training data permitted us to estimate the elevations where seasonal evergreen forest changed to evergreen forest for different windward and leeward slopes on the islands, even though these two forest types were not visually distinct in the IKONOS imagery. The training data for sugar cane included different subclasses that differed by field maturity. The training data also initially combined the signatures for large patches of coastal evergreen forest or shrubland in St. Kitts with seasonal evergreen forest for later editing. Spectral signatures for all barren lands were also combined, and barren lands were later manually separated into different classes (e.g. quarry, sand, bare ground) after decision tree classification. In mountainous areas, we collected a shadowed and sunlit version of each class (Helmer et al. 2000). In Grenada, training data for herbaceous agriculture were collected as pasture in. The herbaceous agriculture class was then manually digitized post classification based on the IKONOS imagery.

For each study area, the Landsat image bands and geographic ancillary data layers were stacked together, resulting in a multiple band raster data stack.   Raster data in the stacks included the optical Landsat image bands 1-5, 7, and two band indices: the normalized difference vegetation index (NDVI) and the band 4:5 ratio. For the St. Kitts study area, we also included variance over 3x3 windows of the 15-m pan band from the leaf-on image mosaic, which we had resampled to a 30-m cell size. The NDVI gauges vegetation greenness, and the band 4:5 ratio is sensitive to forest structure and successional stage in tropical landscapes (Fiorella and Ripple 1993; Helmer et al. 2000). The ancillary data included distance to primary road, distance to coast, distance to ravine, and topographic variables from Shuttle Radar Topography mission data (Farr and Kobrick 2000). Topographic variables included elevation, slope, slope position, aspect, and topographic shading based on the sun elevation and azimuth of each image date (or reference image date in the case of image mosaics) (Leica-Geosystems, 2003). The locations of each pixel in the training data were used to extract corresponding values of the image bands and ancillary data from the stack of raster data for each classification. These data were then input into the See5 software to create a classification model which we then applied to the raster data stack. We used the default values in See5 for classification with pruning, and we included boosting with 10 trials. The classification model was then applied to the stack of raster data with the Classification and Regression Tree (CART) tool for ERDAS Imagine (Leica-Geosystems, 2003) from the U.S. Geological Survey
(ftp://edcftp.cr.usgs.gov/pub/edcuser/dewitz/NLCD_mapping_tool).

Accuracy assessments

For the study areas that underwent decision tree classification, stratified random samples, of about 50 pixels per class, provided data for estimating classification accuracies. The accuracy assessments excluded classes or areas that were entirely visually-interpreted: forested and non-forested wetlands in the St. Kitts study area, herbaceous agriculture in Grenada and the cloud-masked areas that we visually interpreted. Barren classes were also combined for the assessment. We identified the actual land cover or forest formation of these pixels by visual "heads-up" digitization over the IKONOS imagery. With evergreen and seasonal evergreen forest formations not being distinct in the IKONOS imagery, we combined them in the accuracy assessment. We then calculated overall percentage of correctly classified pixels, producer's and user's accuracies, and the Kappa coefficient, which is an indicator that accounts for chance

agreement between classes. Producer's accuracy is the proportion of correctly classified accuracy assessment data; user's accuracy estimates the proportional assignment of pixels to a correct class. Because forest formations and land cover for Barbados were manually delineated, we did not perform an accuracy assessment for that map. Very fine resolution imagery was not available for St. Eustatius at the time of the accuracy assessment. However, we verified and manually edited the classification for St. Eustatius based on the high resolution imagery that is now viewable on Google Earth (http://earth.google.com/).

RESULTS AND DISCUSSION

Landsat image classifications
The Landsat and IKONOS image interpretations produced the first detailed, satellite image-based land-cover and forest formation maps for the islands studied (Figures 2-4, and Table 3). Before manual editing, the overall accuracies for the Landsat image classifications were 69% for the St. Kitts study area and 59% for Grenada. Limited manual editing improved these overall accuracies to 71% and 78%, respectively (Appendices A and B). Kappa coefficients of agreement after manual editing were 0.69 ± 0.04 for the St. Kitts study area and 0.76 ± 0.03 for Grenada. In both study areas, the main sources of error were confusion between low density urban lands, herbaceous agriculture, and pasture, as well as confusion between low and high density urban lands. Training pixels for high density urban lands included only pixels with $\geq 80\%$ manmade structures (from visual interpretation). Those for low density urban lands included both vegetation and up to 80% man-made structures. Both the high and low density urban lands, then, could contain mixed pixels. Landsat image pixels at 30-m resolution that cover a mixture of man-made structures and vegetation can have spectral signatures similar to herbaceous land cover like pasture. Imagery with finer spatial resolution should have a smaller area covered by such mixed pixels and might better distinguish man-made structures from vegetation.

As for the woody vegetation classes, most forest types in both study areas were classified with better than 60% accuracy before manual editing. After limited manual editing, most forest types were classified with greater than 70% accuracy. Drought deciduous woodland showed some confusion with pasture, drought deciduous forest or shrubland formations, and semi-deciduous forest. Pasture and drought deciduous woodland are related, because pasture can have up to 25% cover of drought deciduous, leguminous shrubs or trees. The drought deciduous forest and shrubland classes also have species in common with each other and with drought deciduous woodland. In addition in Grenada, semi-deciduous forest showed confusion with woody agriculture that included coconut or mixtures of cacao, coconut, banana, and other crops.   The high classification accuracy in the error matrix for this class reflects manual editing. Nutmeg plantations in Grenada, which are at middle elevations and have dense evergreen tree cover, are fairly accurately distinguished from evergreen forest by the decision tree classification. The two types of cloud forest also showed some confusion with each other. They are also closely related, having some tree species in common and overlapping elevation ranges.

Considering the large numbers of forest and land-cover classes that were automatically classified, including 17 for the St. Kitts study area and 15 for Grenada, the classification accuracy levels are highly satisfactory. The results are also promising when one considers the

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spectral overlap between classes. Most of the evergreen forest formations have spectral signatures that overlap with each other as well as with woody agriculture and mature sugar cane. By including imagery from different dates, the image mosaics increase this spectral overlap, because the regression tree normalizations have residual error (Helmer and Ruefenacht 2005). Traditional satellite image classifications use only image bands from one image date. They also commonly use maximum likelihood classifiers, which classify based on linear discriminant functions. These algorithms usually only accurately classify five to ten classes. For example, previous work on satellite image interpretation for the Caribbean island of Puerto Rico (Helmer et al. 2002) avoids problems related to spectral overlap between classes by segmenting each image date into separate ecological zones. That work then separately classifies the cloud-free image parts within each ecological zone into about eight land-cover classes (urban/bare, greened-up pasture, sunlit and shadowed senescent pasture, sunlit and shadowed forest, and sunlit and shadowed forest/shrub, plus mangrove for some zones). The problem with this approach is that it requires many training data sets, including one training data set for each ecological zone and scene date, which are time consuming to collect. Moreover, adequate ecological zone maps are not available for all landscapes, and using them to identify forest formations can lead to unrealistically abrupt borders between formations.

The classification approach in this study has three main advantages over more traditional methods and earlier work: the decision tree classifier, the relatively seamless image mosaics, and the multiseason imagery. First, decision tree classification of Landsat image bands together with ancillary data avoids delineating forest formations with ecological zone maps. As a result, separate training datasets for each zone are unnecessary. Not using ecological zone maps may also yield more realistic borders between forest formations. With the decision tree classification, the training data locations delineate different forest formations by parameterizing decision tree classification models. These models use image spectra as well as ancillary data as predictor variables. Variables like elevation in the ancillary data help to distinguish spectrally similar forest formations and land-cover types. The decision tree classifications mapped most land-cover types and forest formations with remarkable accuracy. The decision trees themselves are thousands of lines long and too complex to present in detail. However, the number of times that a variable appears in a tree, and how far down in the tree each variable occurs, can be summarized. In both classifications, the variables that most commonly appear in the top nodes of both decision trees are spectral, or they are ancillary variables that affect the spectral bands, like image topographic shading based on image sun-target-sensor geometry. The spectral bands and indices among the top nodes of the two decision trees included Landsat image bands 3 (red), 1 or 2 (blue or green), 5 or 7 (shortwave infrared), NDVI, and the band 4:5 ratio. In contrast, the layers that appeared in the "leaves" of the trees were the ancillary ones. The topographic variables were at higher-level nodes than the distance variables (distances to roads, rivers or ravines, or the coast). These results suggest that the decision trees first spectrally segment the images and then use the ancillary variables to separate spectrally similar classes, and that the topographic variables are more generally relevant than the distance variables.

A second important factor in these classifications is that the nearly cloud-free image mosaics simplified training data collection. The regression tree normalization more closely matches vegetation phenology between images from different dates than linear radiometric normalization or atmospheric correction (Helmer and Ruefenacht, unpublished data). Consequently, land cover

in cloud-filled areas is similar in tone to corresponding land-cover types in the reference Landsat image. Designating training pixels in cloud-filled areas is consequently easier with the mosaics. This ease of visual interpretation may be the main advantage of the mosaics, because the decision tree software may be able to resolve between-date image differences in mosaics that do not normalize different image dates (Helmer and Ruefenacht, unpublished data). However, results from our preliminary work suggest that good classification results require many training pixels that are well-distributed, and more seamless image mosaics facilitate collection of the training data.

A third aspect of our approach that improved over previous work was the multiseason imagery. Many studies have shown that multiseason imagery enhances image classifications in temperate forest landscapes. In this case, having imagery from two seasons enabled us to identify more forest formations in dry zones. Drought deciduous woody formations are purplish to brown in leaf-off images or image mosaics when displaying Landsat image bands 5 (shortwave-infrared energy), 4 (near-infrared energy) and 3 (red energy) in the red, green, and blue display color guns, respectively. They appear green in "leaf-on" imagery; that is, leaf chlorophyll and water absorb relatively more red and shortwave-infrared radiation. The differences in display tone (i.e., spectral absorption) helped ensure that training data for these classes were correctly located. Consequently, these classifications distinguish drought deciduous from semi-deciduous (and semi-evergreen) formations. Helmer et al. (2002) combined these classes.

Forest protection and land-cover change
In the second half of the 20th century, forest cover has apparently increased on St. Kitts, Nevis, Grenada and Barbados, by 50 to 950% (Table 4). Pasture, drought deciduous woodlands, and developed or bare lands have also increased. Cultivated lands, meanwhile, have decreased by 59 to 99%. Land cover on these islands has shifted from being dominated by agriculture to having from nearly zero (Nevis) to 30% cultivated land cover (Figure 5). Proportional increases in drier formations, the drought deciduous, mixed and semi-deciduous forests or shrublands at lower elevations, were larger than those in evergreen formations. Beard (1949) does not detail his methods for mapping or estimating land-cover areas. However, the published estimates of land cover and forest areas are probably the most reliable and consistent ones available from that era. Visual analysis of the maps suggests that they are geographically accurate, indicating that they were developed with the aid of topographic maps or aerial photos. Moreover, forest appears in the recent maps where it does not appear in the older ones. Finally, new urban developments are visually distinct from older ones in the recent satellite images of the islands. Their presence supports our finding that developed land area has increased. Considering the large land-cover changes, we are confident that the results accurately represent the trends in land-cover change on the islands studied.

Sugar cane cultivation has long been declining in the insular Caribbean, and it continues to decrease. For example, sugar production in 2003 declined greatly from previous levels in Jamaica, Trinidad and Tobago, Barbados, and St. Kitts/Nevis (McDonald 2004). In the latter three countries, sugar cane production has become less competitive as growers in other countries, like Brazil and the United States, have mechanized. Meanwhile, land-cover change to urban and built-up lands, or *urban development,* progresses for housing or tourism. These trends will probably continue, because the European Union has dropped import quotas or price subsidies

that gave banana and sugar farmers in some former colonies preferential access to European markets. As a consequence of these factors, the St. Kitts and Nevis government closed the state-run sugar company in 2005. The land-cover changes on St. Kitts, Nevis and Barbados are strikingly similar to those observed in Puerto Rico, where increases in forest and urban/built-up lands have accompanied an economic shift from agriculture to industry and services (Franco et al. 1997; Rudel et al. 2000; del Mar López et al. 2001; Helmer 2004). In Puerto Rico, a recent analysis of land-cover change from 1951 to 2000 showed that agricultural lands in lowland areas, mainly sugar cane cultivation, shift first to pasture or other grassland (abandoned agriculture), and then they reforest or undergo land-cover change to urban or built-up lands (*land development*). In addition, land development also clears some secondary forest (Helmer, 2004; Kennaway and Helmer, unpublished data). The huge proportional increases in pasture, grassland or woodland in Nevis and Barbados suggest that sugar cane cultivation on those islands also shifts first to pasture, grassland or woodland (sugar cane cultivation previously dominated Nevis agriculture).

Higher elevation forest formations on the islands studied are generally protected in formal or informal reserves (Table 5). Although protected informally, almost 98% to 100% of evergreen and cloud forests are above the 1000-ft elevation contour on St. Kitts and Nevis, where development is prohibited. Land cover above 1000 ft elevation included only 75 ha of sugar cane and 152 ha of pasture/grass on St. Kitts, and about 41 ha of pasture/grass on Nevis. The remaining land cover above 1000 ft was forest or other montane vegetation, suggesting that the limitation on development above 1000 ft elevation provides some protection for those forests. Also above 1000-ft elevation were 19% and 34%, respectively, of the seasonal evergreen forests on St. Kitts and Nevis. On Grenada, cloud forests are 87% to 94% protected, and 28% of the forest classified as evergreen and seasonal evergreen forests is protected. The protected forest estimates for Grenada include the proposed Mt. St. Catherine reserve. It encompasses 76% of the protected palm and elfin cloud forest. It also includes 21% of the protected evergreen and seasonal evergreen forest, and 33% of the protected transitional and tall cloud forest. Informal watershed protection in Grenada also helps to protect much of the forest in montane areas. On Barbados, the 20-ha area of seasonal evergreen forest at Turner's Hall Woods has always been protected even though it is not legally a reserve. On St. Eustatius, seasonal evergreen forest occurs only in the mouth of the volcanic mountain known as The Quill, which is protected. The Quill National Park also protects 68% of the semi-deciduous forest present on the island.

Much smaller proportions of drier forest types are protected on St. Kitts, Nevis, Grenada and Barbados. Although the proportions of existing drier forest formations that are protected range from 0.1 to 4.8%, the areas of protected drier forests are small. For example, the area of protected deciduous, evergreen coastal and mixed forest or shrubland on St. Kitts is only 8.3 ha, though it is 1.2% of the total area of that formation. A substantial portion of the drier forest formations that persist in Barbados are in an extensive limestone, gully network. In St. Eustatius, Boven and The Quill National Parks protect 67% of the driest forest. No forested wetlands are protected on St. Kitts, Nevis or Grenada. An estimate of the proportions of protected areas in lowland ecological zones might better reflect the fact that protected land areas at low elevations on these islands are small. These islands, then, are also similar to Puerto Rico in protected area distribution. Protected lands are mainly at higher elevations, which is important

for water resources. At the same time, lowland ecological zones and ecosystems are not well protected, but pressure for land development is greatest at lower elevations (Helmer, 2004).

<div align="center">CONCLUSIONS</div>

Decision tree classification of Landsat image mosaics is effective for mapping forest formations and land cover in complex tropical landscapes. First, decision tree modeling "learns" the relative importance of various image bands and ancillary data for classifying forest or land cover. Consequently, distinguishing between spectrally similar forest formations does not require ecological zone maps, which are often unavailable or too coarse for these landscapes. Secondly, training data collection is simplified when the data can be collected from image mosaics that minimize cloud cover yet are relatively seamless. Finally, imagery from two seasons reveals the relative extents of drought deciduous forests, shrublands and woodlands. Accurate land-cover and forest formation maps are derivable, then, with only one set of training data instead of separate datasets for the clear parts from each image date and for each ecological zone.

Formal or informal reserves in St. Kitts, Nevis, and Grenada protect almost all cloud forests. These reserves also protect substantial amounts of existing evergreen forest formations. Higher elevation forests are also well-protected on St. Eustatius, as are drier forest types. Drier forest formations are not nearly as well protected on St. Kitts, Nevis, Grenada, and Barbados, and the reserve systems do not protect mangroves.

At the same time, land under cultivation has declined and forest areas have increased over the second half of the 20th century on these islands, which may make more land available for conservation at lower elevations. Development and construction have also increased on all of the islands, mostly at lower elevations. Drier forest types, which are at lower elevations, underwent proportional increases that were greater than evergreen forest formations. Given that 1) relatively small proportions of drier forest formations or mangroves are protected, and 2) most land development occurs at lower elevations, protection and restoration of drier forests on formerly cultivated lands, as well as mangroves, could be important conservation priorities.

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Table 1. Woody vegetation formations mapped in this study.

Woody vegetation Formation This study	Plant Community Formation Beard, 1949
Drought Deciduous or Semi-Deciduous Forest, Forest/Shrub, Woodland and Shrubland (Dry, Dry-Moist), Lowland or Submontane	***Seasonal Formations - Dry Scrub Woodlands***
Deciduous, Evergreen Coastal and Mixed Forest or Shrubland, with or without Succulents	Dry Evergreen Formations[1] 　Dry evergreen forest 　Littoral woodland Secondary and Sub-Climax Dry Evergreen Communities 　Thorny thickets 　Vegetation of sand-dunes and rocky slopes Secondary and Sub-Climax Seasonal Communities 　Cactus bush
Drought Deciduous Woodland 　(grazing or fire)	Rough grazing[2] Secondary Seasonal Communities 　Logwood thicket (*Haematoxylum campechianum*) 　Logwood-Acacia bush 　Thorn savanna (*Prosopis pallida* savanna) 　*Leucaena* thicket (*Leucaena leucocephala*) 　*Croton* thicket (*Croton spp.*)
Drought Deciduous Forest/Shrub 　(grazed in past)	Secondary Seasonal Communities 　Logwood thicket (*Haematoxylum campechianum*) 　*Leucaena* thicket (*Leucaena leucocephala*) 　*Croton* thicket
Semi-deciduous Forest 　(includes Semi-evergreen forest)	Seasonal Formations 　Semi-Evergreen Seasonal Forest 　Deciduous Seasonal Forest
Evergreen Forest and Forest/Shrub (Moist), Lowland or Submontane	***Seasonal Formations - Evergreen Seasonal Forest***
Seasonal Evergreen Forest	Evergreen Seasonal Forest
Seasonal Evergreen Forest with Coconut Palm	-
Evergreen Forest and Forest/Shrub (Moist-Wet, Wet, Rain), Submontane Evergreen Forest[3]	***Seasonal Formations - Evergreen Seasonal Forest*** 　Rain forest Secondary and Sub-climax Communities 　Pioneer forest 　Tree-fern brake 　*Miconia* thicket
Evergreen Forest - Cloud Forest (Moist-Wet, Wet, Rain), Lower Montane	***Montane Formations***
Sierra Palm, Transitional and Tall Cloud Forest	Lower Montane Rain forest Montane thicket Secondary and Sub-climax Communities 　Palm brake 　*Miconia* thicket
Elfin and Sierra Palm Cloud Forest[3]	Elfin Woodland Secondary and Sub-climax Communities[4] 　Palm brake 　Pioneer communities of volcanic ejecta

	Fumarole vegetation
Forested Wetlands	*Edaphic Formations*
Mangrove	Mangrove Woodland
Seasonally Flooded Savannas and Woodlands	Seasonal-Swamp Formations – Savanna

[1]Other Dry Evergreen Communities of Beard: Fire grasslands (occurs in St. Kitts and mapped as pasture/grass); Evergreen bushland.

[2]Not part of dry scrub woodlands in Beard

[2]Sierra Palm present in some areas, like Steep Non-Forest Vegetation.

[3]Montane Non-Forest Vegetation includes Montane herbaceous vegetation, Fumarole vegetation and Miconia thicket

Table 2. Landsat image mosaics in this study, including the base, or reference image for each image mosaic and the dates and overlay orders of images that filled clouds in each reference image.

Phenology of drought deciduous woody vegetation[1]	Landsat image dates for reference image in each mosaic	Overlay order of subject images for image mosaics (2nd-below-top to bottom)	Cloud-obscured land cover in reference image (%)	Cloud-obscured land cover in image mosaic (%)
Grenada, WRS Path/row 001/052				
Leaf-on	11 Nov 01	24 Mar 86 - 30 Sept 00	2.2	0.6
St. Kitts, Nevis and St. Eustatius Path/row 002/048				
Leaf-on	12 Dec 99	5 Sept 00 - 2 Feb 03 - 11 Sept 02	9.1	2.2
Leaf-off	11 Sept 02	2 Feb 03 - 5 Sept 00 - 12 Dec 99	20.7	2.2

[1]Drought deciduous formations include drought deciduous woodlands, drought deciduous forest and drought deciduous forest/shrub.

Table 3. Areas of land cover and forest formations for St. Kitts, Nevis, St. Eustatius, Grenada and Barbados (excludes Grenada islands of the Grenadines). A dash indicates that the class was present but was collapsed to a generalized class at a higher level in the hierarchy. A zero indicates that the class was not detectable or not present. A dash indicates the class was not mapped separately.

Land-cover or forest formation	Symbol in Appendices	St. Kitts (ha)	Nevis (ha)	St. Eustatius (ha)	Barbados[1] (ha)	Grenada (ha)
Urban or built-up land						
High-Medium Density Urban or Built-up Land	UrbnHi	728	141	100	3,840	308
Low Density Built-up Land (Rural or Residential)	UrbnLo	444	528	42	5,231	2,439
Herbaceous agriculture						
Sugar cane	Cane	4,548	0	0	11,518	
Minor crops (including sugar cane in Grenada)	Crops	0	24	0	1,609	332
Mixed and Woody agriculture						
Nutmeg and Mixed Woody Agriculture	MxdWdAg1	0	0	0	0	8,984
Coconut Palm and Mixed Woody Agriculture (including Cacao, Banana, other)	MxdWdAg2	0	0	0	0	469
Coconut Palm-Pasture	MxdWdAg3	9.3	14	0	248	0
Pasture and rangeland						
Pasture, Hay or Inactive Agriculture (e.g. abandoned sugar cane)	PastAg	0	0	0	8,658	2,343
Pasture, Hay or other Grassy Areas	PastGr	2,634	2,724	773	2,459	0
Golf course	Golf	56	49	0	308	12
Drought Deciduous Woodland	DDwoodl	644	981	328	1,081	54
Lower Montane, Non-Forest Vegetation (e.g. *Miconia* thicket)	MontShr	103	12	0	0	0
Steep Non-Forest Vegetation	NonfStp	77	2.8	0	0	0
Drought Deciduous and Semi-Deciduous Forest, Lowland or Submontane						
Deciduous, Evergreen Coastal and Mixed Forest or Shrubland, with or without Succulents, on Limestone or other substrates[1]	DDMxdForShr	753	210	328	2,913	2,162
Drought Deciduous Forest/Shrub	DDForShr	72	325	89	263	0
Semi-Deciduous and Drought Deciduous Forest on Limestone (includes Semi-Evergreen Forest)		0	0	0	2,864	-
Semi-Deciduous Forest (includes Semi-Evergreen Forest)	SDFor	1,155	1,935	159	277	6,422
Seasonal Evergreen and Evergreen Forest, Lowland or Submontane	EVSEfor					6,347
Evergreen Forest with Coconut Palm	EVforC	24	158	0	0	-
Seasonal Evergreen Forest	SEfor	1,453	1,031	11	34	-
Evergreen Forest (includes some Sierra Palm forest)	EVfor	2,726	755	0	0	-
Evergreen Forest, Submontane or Lower Montane						
Sierra Palm, Transitional and Tall Cloud Forest	CLDforTall	575	110	0	0	663
Elfin and Sierra Palm Cloud Forest	CLDforElf	194	45	0	0	198
Wetlands						
Mangrove	Mangrove	13	0.8	0	6.9	172
Seasonally Flooded Savannahs and Woodland		0	5.4	0	0	0
Emergent Wetland	Emergwetl	1.2	0.8	0	4.0	43
No vegetation						
Quarries	Quarry	15	13	0	201	26
Coastal Sand, Rock and Bare Soil	BareC	107	104	86	172	304
Bare Soil (including bulldozed land)	Bare	104	134	112	1,078	-
Water - Permanent	Watr	260	7.0	0	50	63
Cloud-covered areas in final map		0	0	0	615	0
Total		**16,695**	**9,311**	**2,029**	**43,431**	**31,341**

[1]On Barbados, the class Deciduous, Evergreen Coastal and Mixed Forest or Shrubland, with or without Succulents, on Limestone or other substrates, includes a mosaic of deciduous and seasonal evergreen forest/shrub northeast of Mt. Hillaby.

Table 4. Land-cover change from about 1945 (Beard, 1949) to about 2000 for St. Kitts, Nevis, Barbados and Grenada. Beard (1949) did not tabulate land-cover areas on St. Eustatius.

	St. Kitts	Nevis	Barbados	Grenada
Other Uncultivated Land[1]				
1945 (ha)	708	40	5,848	202
2000 (ha)	1,714	977	10,885	3,153
Change (%)	*142*	*2,314*	*86*	*1,458*
Cultivated Land				
1945 (ha)	11,223	8,013	33,508	27,661
2000 (ha)	4,566	52	13,623	9,784
Change (%)	*-59*	*-99*	*-59*	*-65*
Pasture and Drought Deciduous Woodland[2]				
1945 (ha)	0	344	405	1,922
2000 (ha)	3,278	3,705	12,198	2,397
Change (%)	*-*	*977*	*2,912*	*25*
Seasonal Evergreen, Evergreen, and Cloud Forests[3]				
1945 (ha)	3,946	1,295	20	3,946
2000 (ha)	4,972	2,101	34	7,208
Change (%)	*26*	*62*	*71*	*83*
Drought Deciduous, Mixed, and Semi-deciduous Forests[4]				
1945 (ha)	809	668	607	1,052
2000 (ha)	1,979	2,469	6,351	8,584
Change (%)	*145*	*73*	*946*	*716*
All forest % Change	*50*	*134*	*948*	*220*

[1]Towns, villages, golf courses, salt ponds, sand-dunes, coastal rock, other bare ground.
[2]Savannas and rough grazing in Beard (1949).
[3]Rain forest, Lower montane rain forest, Montane thicket, Elfin Woodland, Palm brake and Secondary rain forest in Beard (1949).
[4]Dry scrub woodlands in Beard (1949).

Table 5. Area and proportion (in parentheses) of existing forest formations within informal or formal reserves in St. Kitts, Nevis, St. Eustatius and Grenada (excludes Grenada islands in the Grenadines)[1]. The "protected" forests in St. Kitts, Nevis and Barbados are protected informally (with the exception of Brimstone Hill National Park in St. Kitts). The Grenada protected areas include Mt. St. Catherine reserve, which is not yet formally designated as a reserve.

	St. Kitts	Nevis	St. Eustatius	Barbados	Grenada
	Protected area in ha (% of existing forest protected)				
Semi-Deciduous and Drought Deciduous Forest (includes Semi-Evergreen Forest), Lowland or Submontane					
Deciduous, Evergreen Coastal and Mixed Forest or Shrubland, with or without Succulents	8.7 (1.2)	0 (0)	219 (67)	83 (2.8)	140 (6.5)
Drought Deciduous Forest/Shrub	6.7 (9.3)	0 (0)	14 (16)	0 (0)	-
Semi-Deciduous and Drought Deciduous Forest on Limestone (includes Semi-Evergreen Forest)	-	-	-	138 (4.8)	-
Semi-Deciduous Forest (includes Semi-Evergreen Forest)	54 (4.7)	26 (1.4)	108 (68)	0 (0)	0 (0)
Seasonal Evergreen and Evergreen Forest, Lowland or Submontane	-	-	-	-	1771 (28)
Evergreen Forest with Coconut Palm	0 (0)	0 (0)	-	-	-
Seasonal Evergreen Forest	269 (19)	326 (32)	10 (100)	0 (47)	C
Evergreen Forest (includes some Sierra Palm forest)	2,676 (98)	737 (98)	-	-	C
Evergreen Forest, Submontane or Lower Montane	-	-	-	-	-
Sierra Palm, Transitional and Tall Cloud Forest	575 (100)	110 (100)	-	-	-
Elfin and Sierra Palm Cloud Forest	194 (100)	45 (100)	-	-	578 (87)
Forested Wetlands					187 (94)
Mangrove	0 (0)	0 (0)	-	1.3 (18)	0 (0)
Seasonally Flooded Savannahs and Woodland	-	0 (0)	-	-	-
Proportion of land area under formal or informal protection (%)	25	14	28	2.8	9.1

[1]A dash indicates that the forest formation is not present; a "C" indicates the forest formation was mapped to a more generalized class, at a higher level in the hierarchy.

[2]In Barbados, this class includes some drought deciduous, semi-deciduous and seasonal evergreen forest/shrub northeast of Mt. Hillaby.

Appendix A. Error matrix for the classification of St. Kitts, Nevis and St. Eustatius from a stratified random sample of points over St. Kitts and Nevis. The Kappa coefficient of agreement after manual editing was 0.69 ± 0.04.

Class	Reference																	User's Accuracy (%)
	UrbHi	UrbLo	Cane	Past	Golf	DWoodl	Mntshr	NonfStp	DMxdfor	Dforshr	SDfor	EVforC	EVSEfor	CLDforT	CLDforE	Bare	Watr	
NUrbHi	38	10	0	0	2	0	0	0	0	0	0	0	0	0	0	2	1	72
UrbLo	1	18	5	3	0	2	0	0	0	0	0	0	0	0	0	0	0	62
Cane	1	5	44	6	0	1	0	0	0	1	2	0	2	0	0	0	0	71
Past	3	6	14	51	1	11	0	1	3	0	5	0	3	0	0	4	2	49
Golf	0	1	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	96
Dwoodl	2	4	1	5	0	31	0	0	4	2	4	0	0	0	0	1	0	57
MntShr	0	0	0	0	0	0	6	0	0	0	0	0	1	0	0	0	0	86
NonfStp	0	0	1	1	0	0	0	9	0	0	0	0	2	2	1	0	0	56
DMxdFor	0	0	1	0	0	3	0	0	48	2	4	0	0	0	0	2	1	79
DForShr	0	0	2	0	0	2	0	0	0	41	5	1	1	0	0	0	0	79
SDfor	0	3	2	3	0	1	0	0	0	6	39	3	6	0	0	0	0	62
EVforC	1	0	0	0	0	0	0	0	1	2	1	12	0	0	0	1	0	67
EVSEfor	0	1	2	2	0	0	0	1	0	0	6	1	83	5	2	0	0	81
CLDforT	0	0	0	0	0	0	0	1	0	0	0	0	2	26	7	0	0	72
CLDforE	0	0	0	0	0	0	1	0	0	0	0	0	1	4	17	0	0	74
Bare	4	4	1	0	0	1	0	0	1	0	0	0	0	0	0	42	1	78
Watr	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	1	47	90
Producer's Accuracy (%)	76	34	60	71	88	60	86	75	83	76	58	71	82	70	63	79	90	Overall Correct 71%

Appendix B. Error matrix for classification of Grenada from a stratified random sample of points. The Kappa coefficient of agreement after manual editing was 0.76 ± 0.03.

Class	Reference UrbHi	UrbLo	WdAgN	WdAgC	Past	Woodl	DMxdfor	SDfor	EVSEfor	CLDforT	CLDforE	EMWetl	Mangrv	Bare	Watr	User's Accuracy (%)
UrbHi	41	7	0	0	1	0	1	0	0	0	0	0	0	1	2	77
UrbLo	1	38	1	0	5	0	3	3	1	0	0	0	0	0	0	73
WdAgN	0	2	31	0	1	0	0	5	7	0	0	0	0	1	0	65
WdAgC	0	0	0	32	0	0	0	9	0	0	0	0	1	1	0	73
Past	0	5	2	0	35	0	3	2	0	0	0	0	0	0	0	71
Woodl	0	0	0	0	1	39	6	0	0	0	0	0	1	2	0	80
DMxdfor	0	1	0	0	0	2	38	5	1	0	0	0	0	0	0	81
SDfor	0	0	6	0	1	0	3	46	0	0	0	0	0	0	0	82
EVSEfor	0	0	5	0	0	0	0	2	38	4	0	0	0	0	0	78
CLDforT	0	0	0	0	0	0	0	0	10	36	3	0	0	0	0	73
CLDforE	0	0	0	0	0	0	0	0	1	17	29	0	0	0	0	62
EMWetl	0	0	0	0	0	0	1	0	4	0	0	41	1	0	2	84
Mangrv	0	0	0	1	0	0	1	2	0	0	0	1	39	0	1	87
Bare	0	4	0	1	3	2	2	2	0	0	0	0	0	79	2	83
Watr	0	1	0	0	0	0	0	1	0	0	0	3	0	0	41	89
Producer's Accuracy (%)	98	66	69	94	74	91	66	60	61	63	91	91	93	94	85	Overall Correct 78%

Fig. 1

St. Eustatius, St. Kitts and Nevis land cover and forest formations, 2000

62°50'W   62°40'W

17°30'N

17°20'N

Scale

Kilometers

2   0

Urban or Built-up Land
- High-Medium Density Urban or Built-up Land
- Low Density Built-up Land (Rural or Residential)

Agricultural Land
- Sugar cane (and minor crops)

Rangeland, Grassland, Shrubland
- Coconut Palm-Pasture
- Pasture, Hay or other Grassy Areas
- Golf Course
- Drought Deciduous Open Woodland
- Montane Non-Forest Vegetation (Miconia thicket, herbaceous)
- Steep Non-Forest Vegetation

Other
- Quarries
- Coastal Sand, Rock, Cliffs or Bare Ground
- Bare Soil (including bulldozed land)
- Water - Permanent

Drought Deciduous or Semi-Deciduous Forest,
Lowland or Submontane (Dry, Dry-Moist)
- Deciduous, Evergreen Coastal and Mixed Forest or Shrubland, with or without succulents
- Drought Deciduous Forest/Shrub
- Semi-Deciduous Forest (includes Semi-Evergreen Forest)

Seasonal Evergreen and Evergreen Forest,
Lowland or Submontane (Moist, Wet, Rain)
- Evergreen Forest with Coconut Palm
- Seasonal Evergreen Forest
- Evergreen Forest (includes some Sierra Palm Forest)

Evergreen Cloud Forest,
Submontane or Lower Montane (Wet, Rain)
- Sierra Palm, Transitional and Tall Cloud Forest
- Elfin and Sierra Palm Cloud Forest

Forested and Non-Forested Wetland
- Emergent Wetland
- Mangrove
- Seasonally Flooded Savannahs and Woodland

Fig. 2

Grenada land cover and forest formations, 2001

Urban or Built-up Land
- High-Medium Density Urban or Built-up Land
- Low Density Built-up Land (Rural or Residential)

Agricultural Land
- Herbaceous Agriculture - Cultivated Lands
- Nutmeg and Mixed Woody Agriculture
- Coconut Palm and Mixed Woody Agriculture (Cacao, Banana, other)

Rangeland, Grassland, Shrubland
- Pasture, Hay or Inactive Agriculture
- Golf Course
- Drought Deciduous Open Woodland

Other
- Quarries
- Coastal Sand and Rock
- Water - Permanent

Drought Deciduous or Semi-Deciduous Forest, Lowland or Submontane (Dry, Dry-Moist)
- Deciduous, Evergreen Coastal and Mixed Forest or Shrubland, with or without succulents
- Semi-Deciduous Forest (includes Semi-Evergreen Forest)

Seasonal Evergreen and Evergreen Forest, Lowland or Submontane (Moist, Wet, Rain)
- Seasonal Evergreen and Evergreen Forest

Evergreen Cloud Forest, Submontane or Lower Montane (Wet, Rain)
- Sierra Palm, Transitional and Tall Cloud Forest
- Elfin and Sierra Palm Cloud Forest

Forested and Non-Forested Wetland
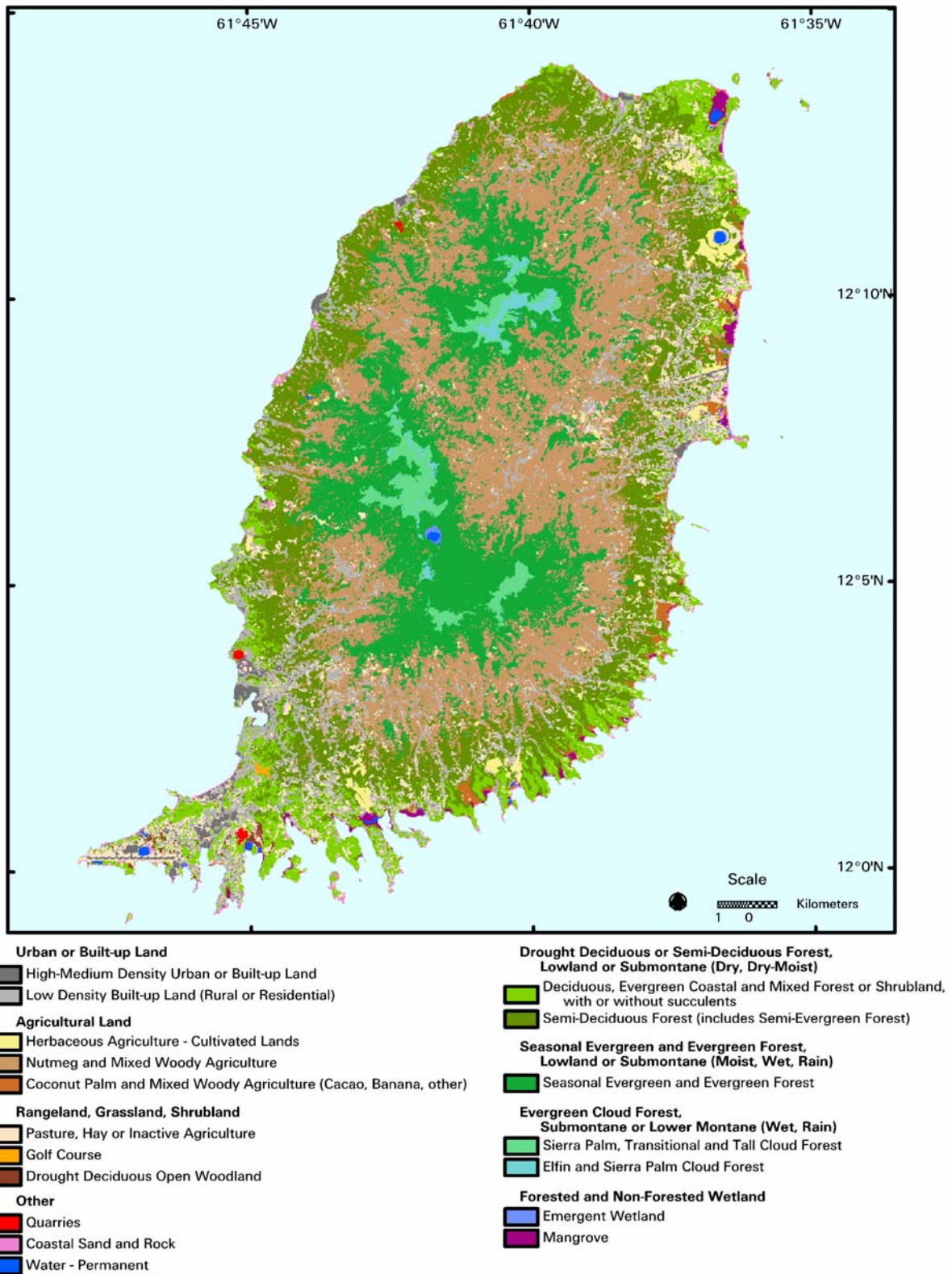- Emergent Wetland
- Mangrove

Fig. 3

Barbados land cover and forest formations, 2000
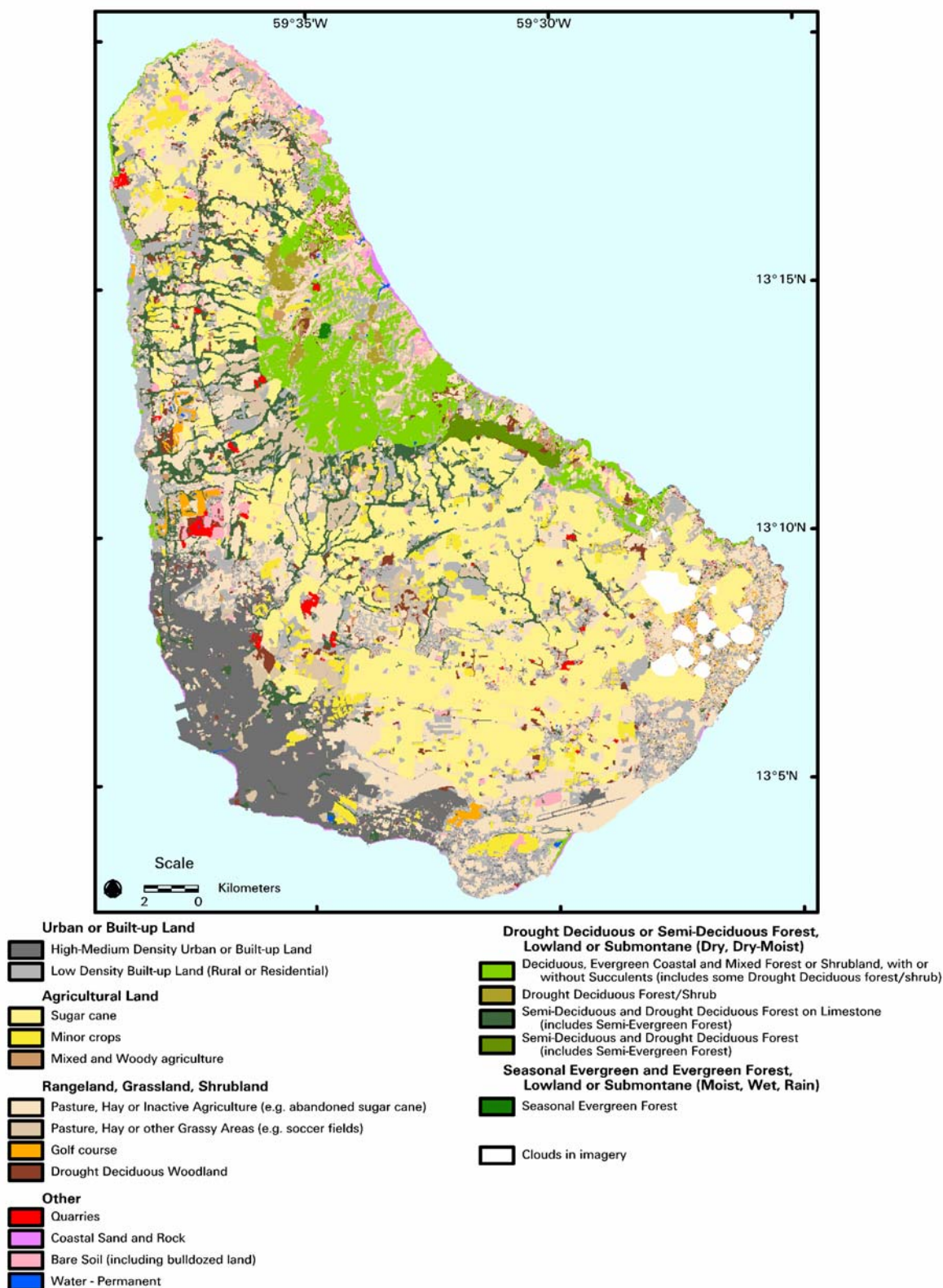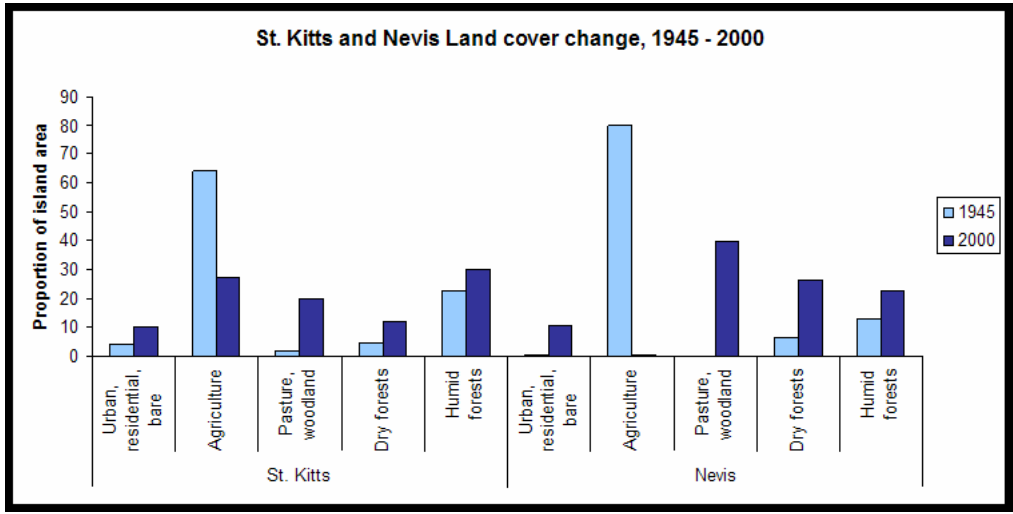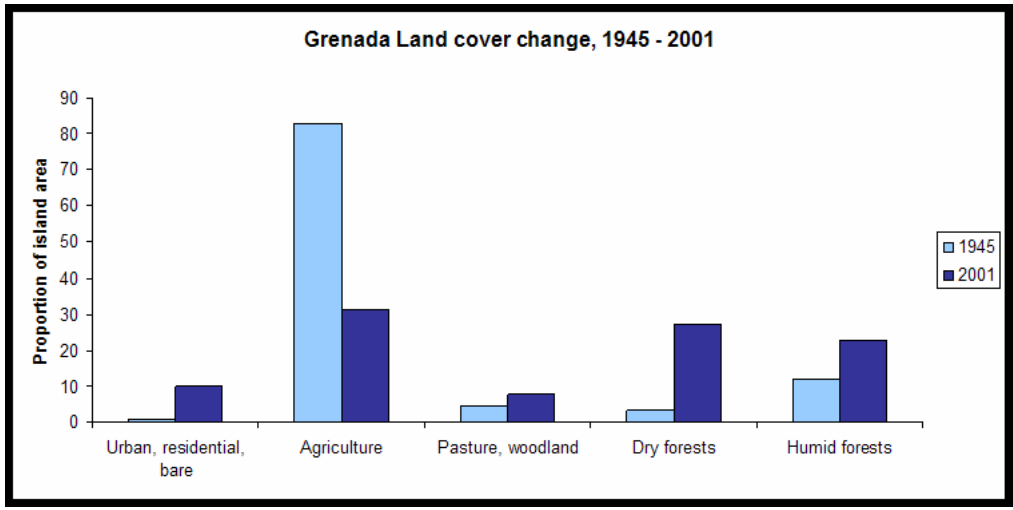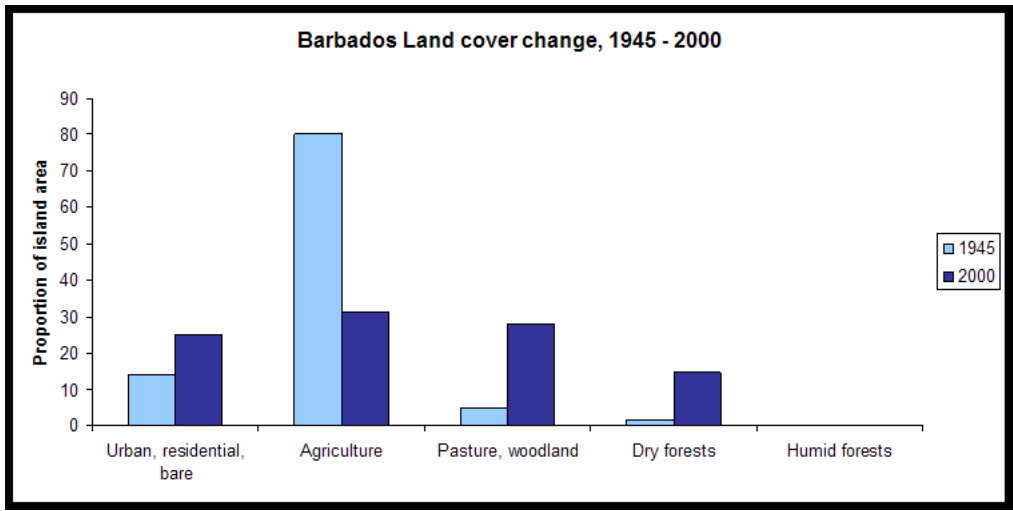

Fig. 4

a.

b.

c.

Fig. 5

Appendix 6 – MONITORING AND EVALUATION PRESENTATION

Slide 1

Caribbean Natural Resources Institute

Strategic monitoring and evaluation

*Forests and Livelihoods
Action Learning Group meeting
October 2009*

Slide 2

INTRODUCTION TO M&E

Slide 3

Meeting Bill Gates...

- Caribbean organisation: What do you do with this opportunity? What do you say?
- Bill Gates: What information (evidence) have you heard that convinces you that an organisation is doing a good job (making a difference) and you should consider giving them money?

Slide 4

Purpose of M&E

1. Accountability
   - **Results:** How can we "show/prove" that we are doing good work? How are we making a difference?
   - Upward, horizontal, downward accountability

Slide 5

Purpose of M&E

2. Learning
   - **Process**: What are we learning about how we work? Is the approach we are using the best approach? How can we make it better?
   - informed decision-making
   - enhanced knowledge and skills
   - providing information for communication and advocacy
   - enhanced collaboration among partners
   - built support, energy and enthusiasm

Slide 6

ACCOUNTABILITY & LEARNING: A BALANCING ACT

Sourced from Terry Smutylo

WHAT IS MONITORING AND EVALUATION

Think about...

- What is the first word that comes into your mind when you hear the words:
  - "monitoring"
  - "evaluation"

Monitoring - outputs	Evaluation - outcomes
• Conducted <u>throughout</u> the activity	• Conducted at <u>discrete points</u> or <u>completion</u> of activity
• A continuous process	• A defined single process
• Gives information on if following the plan, what assumptions change, what steps not achieved, etc.	• Gives information on whether the activity was successful, had negative impacts, suggests improvements, identifies gaps & new avenues, etc.
• Inputs into constant revision of plan	• Inputs into designing new projects
• Urgency – need to take action	• Encourages broader reflection
KEEPING ON TRACK	BEING STRATEGIC

What are you asking in monitoring?

- What progress is being made?
- Are activities/programmes are being carried out <u>as planned?</u>
- What is being learned to improve <u>effectiveness</u> and <u>efficiency?</u>

Effectiveness: result
Efficiency: optimal use of resources

What are you asking in evaluation?

- Are you having <u>desired</u> (positive) results?
- Are you having <u>unanticipated</u> negative or positive results?

Planning

Monitoring and evaluation

Doing

What are outputs?

- Observable short-term and medium-term tangible effects as a direct result of your action
- You <u>directly control</u> the outputs
- Examples?

What are outcomes?

- Long-term observable changes
- Your action contributes to these changes
- You can only <u>influence</u> the outcomes
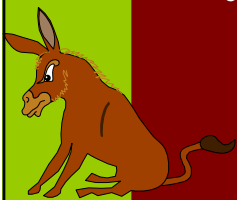- Examples?

Outputs vs. Outcomes

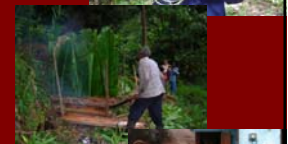## DEVELOPING A M&E SYSTEM FOR THE FORESTS AND LIVELIHOODS PROGRAMME

How do you feel?

"Nothing in life is to be feared... only to be understood."

Marie Curie

How do we measure "success"?

Outcome Mapping approach to M&E

Note: combined logframe/OM approach in F&L programme

- Focuses on one type of result / outcome = The solution is changing people!
- Measures changes in behaviours, relationships, actions, and/or activities of the people and organisations with whom you work directly.

Developing a M&E system

Why?	How?	Who?	What?
Vision / goal	Mission / purpose Strategies Org Practices	Stakeholders (Boundary Partners and partners)	Outcome Challenges Progress Markers

8 key steps

1. Develop vision/goal
2. Develop mission/purpose
3. Identify target group(s)
4. Define desired results (outcomes)
5. Identify indicators
6. Identify M&E priorities
7. Identify how will collect information
8. Develop M&E plan

1. Develop vision/goal

"If you don't know where you are going any road will take you there."
The Koran

- Positive statement
- Guiding image of success
- Looks long term
- Picture of the future

F&L programme vision

- Improved livelihoods and reduced levels of poverty through participatory institutions for forest management that facilitate conservation, wise use and the equitable distribution of forest goods and services that are critical to development.

2. Define how we will achieve this

Mission / purpose:
- How will we contribute to achieving the vision?
- What piece will we focus on?
- What areas will we work in?
- What will we do?

F&L programme goal

- To improve livelihoods and contribute to poverty reduction by promoting and facilitating sustainable use and management of forests, building effective institutions and facilitating collaboration between key stakeholders, using participatory action research, capacity building, and promoting use of lessons learned.

3. Identify who to target

Credit: IDS

Boundary Partners: those we <u>directly</u> target to influence change
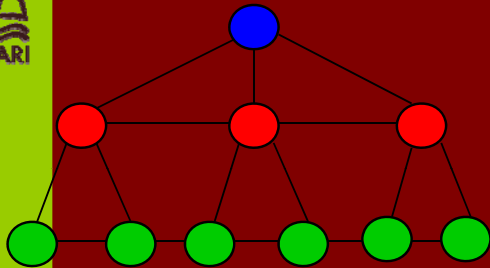
The Real World

Programme / project

= Programme/project`s Boundary Partners

Credit: IDS

- Programme/ project
- Programme/ project's Boundary Partners
- Boundary Partners' Boundary Partners

Who are the F&L programme boundary partners?

- Which individuals, organisations or groups are having, or could have, a positive or negative effect on achieving the vision?
- Who can we influence or support to stimulate their best possible contribution to the vision? (in terms of their behaviour, actions and/or influence over others)
- Who can we work with directly in order to benefit the people we ultimately want to reach / help / influence / change?

---

4. Define outcomes

- Express as changes in people!!!
- Changes in boundary partner's:
  - Relationships
  - Activities
  - Actions
  - Interactions
  - Behaviours

F&L programme outcomes?

- "The F&L programme intends to see [boundary partner] who [description of behaviours in the active present tense]."
  - Relationships
  - Activities
  - Actions
  - Interactions
  - Behaviours

Outcome for communities (challenge statement)

- Local community groups are working with government agencies managing forest resources to ensure that there is sustainable use of forest resources and forest goods and services are conserved. They are facilitating and supporting small business enterprises in the community that support livelihoods. They are sharing experiences with each other and collaborating on joint projects for mutual benefit. Etc etc etc.

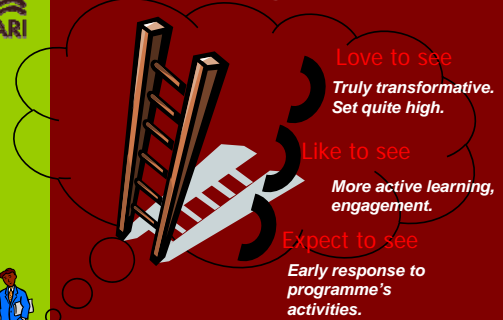## 5. Develop indicators of change – progress markers

Love to see
Truly transformative. Set quite high.

Like to see
More active learning, engagement.

Expect to see
Early response to programme's activities.

Credit: IDS

Examples of progress markers

Expect to See local communities:
1. Participating in meetings
2. Applying new skills and knowledge
3. Contributing resources

Examples of progress markers

Like to See local communities:
1. Developing partnerships
2. Calling upon external experts when necessary
3. Requesting new opportunities for training
4. Forming small business enterprises in the community based on sustainable use of forests

Examples of progress markers

Love to See local communities:
1. Helping other groups establish themselves
2. Sharing lessons learned internationally
3. Influencing national policy debates & decisions on resource use and management

Why graduated progress markers?

- Express the complexity of the change process
- Permit on-going assessment of partners' progress (including unintended results)
- Encourages the programme / project to think about how it can intentionally contribute to the most profound transformation possible
- Make mid-course corrections & improvement easier

Small group work

Choose one boundary partner:

1. Define the desired outcome for that boundary partner
2. Define progress markers to track progress towards the boundary partner changing to achieve the outcome

Tools for collecting info

- direct observation (of people's behaviour or state)
- documentation review
- photographs and video
- questionnaires , surveys, interviews, focus groups, consultations
- case studies
- diaries / learning journals
- social, network or institutional mapping
- most significant change stories
- participatory video

"One thousand years old journey starts with the first step and that is the most difficult one."

Ancient Chinese proverb

Appendix 7- HANDOUTS AND WORKSHEETS FOR MONITORING AND EVALUATION.

Handout on applying Outcome Mapping to develop a monitoring and evaluation system for a programme or project

1. **Develop vision / goal**

   Imagine that in 3-5 years the project has been extremely successful.

   - What changes will you have helped bring about?
   - What are your partners doing differently?
   - What have they achieved?
   - In essence, what would total success look like?

2. **Define mission / purpose**

   Describe what will be done to contribute to achieving the vision.

   - How will you contribute to achieving the vision?
   - What piece will you focus on?
   - What areas will you work in?
   - What will you do?

3. **Identify who you will be targeting**

   Boundary partners: Those individuals, groups, and organizations with whom the programme / project interacts directly to effect change and with whom the programme / project can anticipate some opportunities for influence.

   A programme / project can choose its boundary partners because it wants to influence them or because they will influence others.

   Identify boundary partners:

   - Which individuals, organisations or groups are having, or could have, a positive or negative effect on achieving the vision?
   - Who can the programme / project influence or support to stimulate their best possible contribution to the vision? (in terms of their behaviour, actions and/or influence over others)
   - Who can we work with directly in order to benefit the people we ultimately want to reach / help / influence / change?

Strategic partners: Those individuals, groups, and organizations who have information, knowledge, resources or influence important to achieving the vision.

Identify strategic partners:

- Which individuals, organisations or groups have information, knowledge, resources or influence that can contribute to achieving the vision?
- Who can we partner / collaborate with?

4. Define what will tell you that you have achieved your vision

Outcomes: Changes in relationships, activities, actions, or behaviours of boundary partners that can be logically linked to a programme / project's activities although they are not necessarily directly caused by it. These changes are aimed at contributing to specific aspects of human and ecological well-being by providing the boundary partners with new tools, techniques, and resources to contribute to the development process.

Outcomes can be defined for <u>each</u> boundary partner:

- Ideally, in order to make a maximum contribution towards making the vision a reality, how would the boundary partner behave? What would then be doing? With whom?
- Imagine that in 3-5 years the programme / project has been extremely successful, what would we see going on in the boundary partner's actions and relationships?

Outcomes for each boundary partner should be written as points / statements that:

- express observable behaviour;
- identify actions or relationships of the boundary partner;

"The program intends to see [boundary partner] who [description of behaviours in the active present tense]."

5. Describe the change process to identify indicators that will tell you if/how you are making progress

Progress Markers: A set of graduated indicators of observable changed behaviours, actions, interactions, or relationships for a boundary partner that focus on depth or quality of change.

For <u>each</u> boundary partner, reflect on the outcome defined:

- How will you know if the boundary partner is moving towards behaving as described in the outcome?

- What would be the boundary partner be doing better or differently? What relationships will the boundary partner be engaged in? What actions will the boundary partner be taking?
- What milestones would be reached as the boundary partner moves towards their intended role in contributing to the vision?

Identify 10-12 progress markers that track the full transformation of the boundary partner. These can be graduated by grouping into three categories as what the programme / project would:

1. Expect to see its boundary partners doing?
2. Like to see its boundary partners doing?
3. Love to see its boundary partners doing?

Decide if you want to add other traditional types of indicators to complement these. (e.g. changes in policies, environment, resource, state)

6. Identify monitoring and evaluation priorities

Given limited resources, base priorities on the intended use of intended users. Priorities will need to consider :

- Learning needs - Use(s) for findings from process to improve performance through learning
- Accountability needs - Help meet reporting requirements
- Communication needs - Inform publicity documents, communication activities, or case-study materials

7. Identify how to collect information

There are many methods to collect information. Criteria that you can use to choose the most appropriate method include:

- Does it fit in with our commitment to participation?
- Will it build the capacity of the stakeholders involved?
- Does it give info for learning as well as for accountability?
- Will it capture complexity and the unplanned?
- Will it provide the information that is needed at the right time to feed into decision making?
- Is it cost effective – value for money?
- Do we have or can we get the capacity to use it?
- Does it fit in with what do already?

8. Develop monitoring and evaluation plan

- Who needs the information?
- What questions will be answered?
- What information will be collected?
- How?
- By whom?

- When?
- How much will it cost (resources)?
- How will you communicate the information?

Definitions in Monitoring and Evaluation[1]

Term	*Definitions*	*Explanation and examples[2]*
Monitoring	A continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing development intervention with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds.	Conducted throughout the activity. A continuous process. Gives information on if following the plan, what assumptions have changed, what has been achieved and what has not been achieved, if the approach is working, what needs to be done differently, etc. Inputs into constant revision of the plan and its implementation. Information gained results in urgent and immediate action. Helps projects, programmes, organisations keep on track.
Evaluation	The systematic and objective assessment of an on-going or completed project, programme or policy, its design, implementation and results. The aim is to determine the relevance and fulfilment of objectives, development efficiency, effectiveness, impact and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision–making process of both recipients and donors. Evaluation also refers to the process of determining the worth or significance of an activity, policy or program. An assessment, as systematic and objective as possible, of a planned, on-going, or completed	Conducted at discrete points or on completion of the activity. Is a defined single process. Gives information on whether the activity was successful, had positive and/or negative impacts, suggests improvements, identifies gaps and new avenues, etc. Inputs into designing new projects. Encourages broader reflection. Helps projects, programmes and organisations be strategic.

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[1] Definitions taken from OECD (2002). Glossary of Key Terms in Evaluation and Results Based Management. Developed by the Development Assistance Committee (DAC) Working Party on Aid Evaluation. OECD, Paris.

[2] Adapted from Ricardo Wilson-Grau (2008). Customising definitions of outputs, outcomes and impact.

Term	Definitions	Explanation and examples[2]
	development intervention.	

Term	Definitions	Explanation and examples[2]
Result	A development result is the output, outcome or impact (either intended or unintended, positive or negative) of one or more activities intended to contribute to physical, financial, institutional, social, environmental, or other benefits to a society, community, or group of people.	All all-encompassing term. The output, outcome or impact (intended or unintended, positive and/or negative) of a development intervention.
Output	The products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.	The immediate results of your organisation's activities – the processes, goods and services that it produces. For example: workshops, training manuals, research and assessment reports, guidelines and action plans, strategies, and technical assistance packages. The key to distinguishing outputs from other types of results is that your organisation <u>controls</u> its outputs. For example, outputs includes the knowledge, skills or attitudes that have changed when an individual or group of people participate in your workshop because you control the quality of your intervention. It does not include, however, what the individual group does (or does not do) with the new knowledge, skills or attitudes.
Outcome	The likely or achieved short-term and medium-term effects of an intervention's outputs. Outcomes are the observable behavioural, institutional and societal changes that take place over 3 to 10 years, usually as the result of coordinated short-term investments in individual and organizational capacity building for key development stakeholders (such as national governments, civil society, and	Observable positive or negative changes in the actions of social actors that have been influenced, directly or indirectly, partially or totally, intentionally or not, by your activities or your outputs that potentially contribute to the improvement in people's lives or of the environment envisioned in the mission of your organisation. Your organisation only <u>influences</u> outcomes. Thus, what an individual, group or organisation does differently as a result of your intervention is an

	the private sector).	outcome because what you did does not determine that action.
Impact	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.	Long-term, sustainable changes in the conditions of people and the state of the environment that structurally reduce poverty, improve human well-being and protect and conserve natural resources. Your organisation <u>contributes</u> partially and indirectly to these enduring results in society or the environment.

Handout for small group work on designing desired outcomes and progress makers for boundary partners in the Forests and Livelihoods programme

9. **Vision for Forests and Livelihoods programme**
    "Improved livelihoods and reduced levels of poverty through participatory institutions for forest management that facilitate conservation, wise use and the equitable distribution of forest goods and services that are critical to development."

10. **Goal for Forests and Livelihoods programme**
    "To improve livelihoods and contribute to poverty reduction by promoting and facilitating sustainable use and management of forests, building effective institutions and facilitating collaboration between key stakeholders, using participatory action research, capacity building, and promoting use of lessons learned."

11. **Boundary partners for Forests and Livelihoods programme**

    List the boundary partners identified:

    | |
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    Boundary partners: Those individuals, groups, and organisations with whom the programme / project interacts <u>directly</u> to effect change and with whom the programme / project can anticipate some opportunities for influence.

12. **Define what will tell you that you have achieved your vision**

    Define an outcome for <u>each</u> boundary partner:
    - Ideally, in order to make a maximum contribution towards making the vision a reality, how would the boundary partner behave? What would then be doing? With whom?
    - Imagine that in 3-5 years the programme / project has been extremely successful, what would we see going on in the boundary partner's actions and relationships?

    Outcomes: Changes in relationships, activities, actions, or behaviours of boundary partners that can be logically linked to a programme / project's activities although they are not necessarily directly caused by it.

Word the outcome as: "The programme intends to see [boundary partner] who [description of relationships/ behaviours/ actions/ activities/ interactions in the active present tense]."

13. **Describe the change process to identify indicators that will tell you if/how you are making progress**

For each boundary partner, identify 10-12 progress markers that track the full transformation of the boundary partner. These can be graduated by grouping into three categories as what the programme / project would:

4. <u>Expect to see</u> its boundary partners doing?
5. <u>Like to see</u> its boundary partners doing?
6. <u>Love to see</u> its boundary partners doing?

> ***Progress Markers:*** A set of graduated indicators of observable changed behaviours, actions, interactions, or relationships for a boundary partner that focus on depth or quality of change.

Progress markers can be identified by thinking about:
- How will you know if the boundary partner is moving towards behaving as described in the outcome?
- What would be the boundary partner be doing better or differently? What relationships will the boundary partner be engaged in? What actions will the boundary partner be taking?
- What milestones would be reached as the boundary partner moves towards their intended role in contributing to the vision?

Boundary partner:
Outcome:
Progress markers: (10-12) <u>Expect to see:</u> √ √ √ √ <u>Like to see:</u>

√
√
√
√
<u>Love to see:</u>
√
√
√
√

Appendix 8 – FIELD TRIP BRIEF
Introduction
The ALG will be meeting with the Morne Longue (long hill) community, in the parish of St.Andrews on the eastern side of Grenada. The community is approximately 18 miles from the Capital St.Georges.Morne Longue is a rural poor community and residents depend mainly on Agriculture, hunting and fishing to sustain their livelihoods. The community is located at the lower elevations of "FEDON CAMP".
From St.Georges, the trip will take the group along the north eastern side of the island, passing through small villages and through the grand etang forest reserve up to Morne Longue community. Participants may have the opportunity to visit the grand etang lake within the reserve and if time permits some other scenic areas.

Background
Fedon Camp is historically significant to Grenada, dating back to the 16th century, when there was always a struggle for control of the island. Julian Fedon a French planter spearheaded a rebellion against the British in 1795 which lasted for 15 months. This was one of the longest rebellion in Caribbean history.Fedon had established his camp between the Grand Etang and Belvidere mountains.
 The surrounding villages of Morne longue, Belvidere, Clozier, Brothers and Gouyave had a very strong French presence and were used as planning grounds for strikes/attacks against the British. The camp is deeply associated with Grenada and is a major attraction for tourists, visitors and locals
The camp is divided into three sections. The lower part consisted of estate houses, coffee houses, spice houses etc.The mid section comprised the big parade square which was regarded as "CAMP LIBERTE".The top of the hills, second plateau was considered as "FATERNITY" and the last defensive position was considered as "DEATH". During attacks on the camp the prisoners' were moved from the lower level to the top.
Management of forest resources
The forestry and National parks department has management responsibility for the Fedon camp and has given technical advice to the community during the trail development process.
On the field trip
- The group will meet with Morne Longue community group members, who has in collaboration with GRENED, recently implemented the morne longue-fedon trail development project, Will also meet with members from GRENED (NGO), Representative from Grenada Board of Tourism (GBT), Representative from United Nation Trust Fund for Human Security (UNTFHS)

- Visit the community, walk part of the trail, hold General discussions with relevant stakeholders, break up into groups followed by plenary

- discuss critical issues , ongoing implementation/development of the project, potential livelihood benefits' and sustainability of the initiative

Appendix 9 – Presentation on Communication Strategy

Slide 1

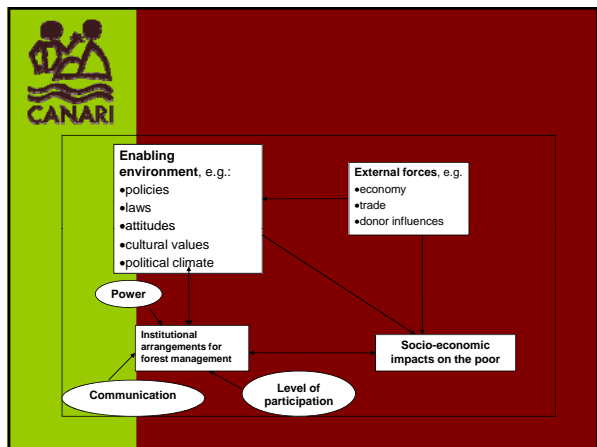**Caribbean Natural Resources Institute**

World Forestry Congress paper
Moving from rhetoric to reality: how can participatory forest management contribute to improving the livelihoods of the rural poor in Caribbean small island states?

*Forests and Livelihoods
Action Learning Group meeting
October 2009*

Slide 2

CANARI

Conceptual frameworks

- Action learning
- Livelihoods
- Participation
- Capacity

Slide 3

CANARI

Enabling environment, e.g.:
- policies
- laws
- attitudes
- cultural values
- political climate

External forces, e.g.
- economy
- trade
- donor influences

Power

Institutional arrangements for forest management

Communication

Level of participation

Socio-economic impacts on the poor

Slide 4

CANARI

Research questions

Overarching:
- What type of institutional arrangement for forest management optimises the socio-economic benefits to the rural poor?

Slide 5

CANARI

Research questions

- *Enabling environment and external forces*
- *Socio-economic (livelihood) impacts*
- *Institutional arrangements*
- *Capacities*

Slide 6

CANARI

Case studies

1. Warmmae Letang, Dominica
2. Grande Riviere, Trinidad
3. Partners of the Environment, St. Vincent
4. Gros Pitons Tours, Saint Lucia
5. Fondes Amandes, Trinidad
6. Nature Seekers, Trinidad
7. Dolphin Head Trust, Jamaica

Analysis

- Evidence of range of livelihood benefits – not quantified
- See examples of formalised, flexible and informal arrangements that allow for livelihood benefits
- Key capacities needed include: governance and small business skills for CBO; facilitation and support for government agencies

Conclusions

- External forces and internal capacities of stakeholders play an immense role in enabling or hindering to what extent management arrangements can provide livelihood benefits
- 'One size fit all' recommendation on institutional arrangements that optimise livelihood benefits is clearly inappropriate

*Caribbean
Natural
Resources
Institute*

Communication strategy for the Forests and Livelihoods Programme

*Forests and Livelihoods
Action Learning Group meeting
October 2009*

Messages are about...

- External factors
- Institutional arrangements
- Capacity issues
- Livelihood benefits

Communicated budgeted under EU project

Products:
- WFC paper
- Case studies
- Newsletter (4)
- One policy brief
- One technical guidelines document
- Newspaper articles and press releases

Communicated budgeted under EU project

Pathways:
- Website
- National workshops (targeting CBOs)
- Exchange visits
- Regional Forests and Livelihoods conference
- Directly through action by ALG members

Target audiences

1. Rural communities – forest users?
2. Media
3. Political directorate – Ministers?
4. CBOs - involved in activities related to forest use and/or livelihood development?
5. Private sector (service providers)
6. Technical support agencies
7. Senior public officers - technocrats responsible for policy making and the management of forests?
8. International bodies
9. Advocates - individuals?
10. NGOs - involved in activities related to forest use and/or livelihood development?
11. Donors

TBD: Youth - youth groups?

Small group work

- Select a priority target audience and identify:
  1. What is the desired action or response? (behaviour)
  2. What communication products and pathways should be used?
  3. What are the key messages?
  4. What is the role of the ALG in communication/influence?

"One thousand years old journey starts with the first step and that is the most difficult one."

Ancient Chinese proverb

Appendix 10 – HANDOUT ON COMMUNICATION
Handout on effective communication[3]

Pathways that work for different audiences
Just as every stakeholder has a slightly different role to play in achieving the objectives of a communication strategy, each stakeholder accesses and absorbs information differently, and these "pathway preferences" also need to be well understood. Some of the pathways most commonly used in the region, as well as their main target audiences, are indicated in the following table.

Table 1: Dissemination pathways and audiences

Dissemination method	Sample target audiences					
	Managers and researchers	Policy-makers	Civil society	Resource users	Educators and trainers	General public
Informal face-to-face meetings	X	X	X	X	X	
Field visits	X	X	X	X	X	
Staff exchanges	X					
Small group meetings		X				
Training workshops	X	X	X	X	X	
Cultural media				X		X
Seminars/conferences	X	X	X		X	
Exhibitions		X		X		X
Written case studies	X		X		X	
Guidelines documents	X		X		X	
Visual presentations, including videos and PowerPoint	X	X	X	X	X	X
Public media including radio shows and public access television		X				X
Press coverage						X
Books/scholarly papers	X				X	
Brochures	X					
Policy briefs		X				
Educational materials			X		X	
Internet	X		X		X	

For a great many stakeholders, the most effective pathways to convey messages and promote tools and approaches involve face-to-face communication. Broader dissemination pathways, including e-mail, Internet, newspapers, radio, exhibits and other special events, only reach certain target audiences and are therefore of no value with others. There is thus a need to

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[3] Extracted from CANARI. 2005. Coastal Management to Improve Livelihoods: A regional communication strategy for policy and institutional change. Developed for the project "Institutional arrangements for coastal management in the Caribbean" funded by the UK Department for International Development's Natural Resources Systems Programme (NRSP).

understand what media are used by different target audiences, and in what ways, before disseminating through them.

Designing products and pathways with specific audiences in mind

For messages to be listened to and understood, they need to be couched within a particular target audience's own perspective and context, and these can vary widely. Different stakeholders can have very different views on key issues such as the relative values of coastal resource protection, livelihood sustainability, and economic development. For example, politicians tend to think about coastal management issues from the perspective of financial investment and employment creation, while local residents think about them in terms of their livelihoods and quality of life, resource managers in terms of conservation and conflict mitigation, and holiday-makers in terms of recreational opportunities. Products and pathways need to be designed in ways that will stimulate interest rather than alienate individual audiences.

Products also need to be accessible to their targets, which means they must take account of the different ways in which people absorb information and the time they have available. For example, graphics, including photographs, illustrations, tables and diagrams, can be quite effective in reaching stakeholders (such as politicians or busy technocrats) who can not spare much time, those with limited literacy skills, or audiences who speak different languages. Box 1 provides some other tips for reaching specific audiences.

Research on uptake promotion on coastal management and livelihoods has provided a few lessons, summarized in the following table, on what works and what does not with some key audiences.

Table 2: Tips for reaching key target audiences

Target group	Main challenges	Tips
Policy-makers	Getting their attention: lack of time may preclude face-to-face meetings and prevent them from reading much of the material they receive.	Try reaching them through intermediaries who have access to them.
		Keep messages succinct: a two page briefing is better than four pages; one page is even better.
		Provide them with examples of tangible benefits, even from other countries or regions.
		Make liberal use of illustrations, diagrams and graphics in material and in presentation.
		Be prepared to make oral presentations or have discussions as opposed to more formal presentations with visual aids.
Senior technocrats	Getting them to consider issues and problems in non-traditional ways.	Field trips for this audience can both bring the complexity of issues to life and generate cross-sectoral dialogue.
Teachers and trainers	Are often unwilling or uncomfortable presenting material they feel they lack expertise in.	Providing training materials and guidance on using them may not always be enough; it is sometimes also necessary to provide a co-trainer until comfort levels improve.
		Because most students and trainees are interested in practical application, provide materials with examples and case studies rather than simply theory.
Journalists	Accommodating their schedules and deadlines.	Provide background material and direct them to sources with relevant information: case studies and examples are very helpful.
		Present the message you want them to send clearly and specifically, but accept that they will convey it in their own way.
Researchers	Collaborating with other disciplines, linking with the field and accepting new notions and approaches.	Create opportunistic partnerships between researchers and field practitioners, and involve researchers in policy processes.
		Provide case studies and examples of inter-disciplinary work.

Table 3: Implementation roles of strategy partners

Potential partners	Main roles
Governments, particularly ministries, departments, and agencies involved in coastal management issues, community development, poverty programmes, and education	■ Adopt and promote the strategy's tools and approaches ■ Disseminate the strategy's products through official channels, media and distribution lists ■ Incorporate the strategy's messages in public statements, speeches and documents ■ Provide forums for stakeholders to discuss and further develop the strategy's messages and tools
Regional organisations involved in coastal resource management, sustainable development, and capacity building	■ Incorporate the strategy's messages in regional policies and agreements ■ Provide governments and other actors with information needed to develop policies and institutions in support of the strategy's aims ■ Support key messages through programmes and projects ■ Disseminate tools and approaches through publications, conferences and training activities ■ Support the development and dissemination of new communication products to reach key target audiences ■ Provide forums for stakeholders to discuss and further develop the strategy's messages and tools ■ Encourage donor agencies and international partners to contribute to and support the strategy's aims
NGOs working in the fields of conservation, natural resource management, poverty reduction, and education	■ Support the strategy's messages in programmes and projects ■ Encourage governments to support the strategy's aims ■ Provide governments and other actors with information needed to develop policies and institutions in support of those aims ■ Develop and disseminate new communication materials to reach key target audiences ■ Channel the strategy's messages through media contacts and policy influencers ■ Provide forums for stakeholders to discuss and further develop the strategy's messages and tools
Community organisations	■ Advocate for policies and practices that support the strategy's aims ■ Channel the strategy's messages through local opinion leaders and politicians ■ Encourage and build the capacity of local stakeholders to adopt the strategy's tools and approaches ■ Test and refine messages and tools to suit local contexts and needs
Private sector	■ Support the strategy's messages in research and corporate social responsibility programmes, projects and public relations campaigns ■ Encourage politicians and other private sector interests to support the strategy's aims ■ Assist in further development of tools and approaches through research
Universities, particularly faculties dealing with natural resource management and social sciences	■ Incorporate the training materials included in the strategy's tool box in relevant curricula and short courses ■ Develop new training materials to suit the needs of specific courses and programmes ■ Incorporate the strategy's messages into the design of undergraduate and graduate programmes and courses

Potential partners	Main roles
Research and training institutions	▪ Conduct research on issues related to integrated coastal management and livelihood improvement ▪ Provide training in the use of the strategy's tools and approaches ▪ Build partnerships between themselves and other management actors (government, civil society, private sector) as well as between disciplines within the institutions ▪ Ensure the dissemination of research results in a form and manner that make them usable and useful
Donors and technical assistance agencies	▪ Support the implementation and further development of this strategy

Appendix 11 – Draft Regional Conference Concept.

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CANARI

SUMMARY OF REGIONAL MEETING PROPOSAL

1. **Title:** "Forests for People, People for Forests: Forest-based livelihoods in the Caribbean"

2. **Dates:** May 11-14, 2010

3. **Venue:** Trinidad

4. **Target group:** 80 participants from groups working at the local, national and regional level:
   - Regional and international invited speakers from development, policy and academic back grounds who will be presenting together with CANARI reporting back on its research and community participants sharing experiences and making recommendations for change
   - Community-based organisations (CBOs), non-governmental organisations (NGOs) and individuals working on forest conservation and forest-based livelihoods
   - Policy makers and technocrats from key sectors such as forestry, environmental management, tourism, land use planning, watershed management, poverty alleviation, community development.
   - Regional academic institutions
   - Technical and financial support agencies
   - Intergovernmental bodies
   - Media

5. **Target countries:** All islands of the Caribbean (English-, French-, Spanish-, Dutch- and Creole-speaking), including the dependent territories. The conference will be conducted in English and funding will be sought for simultaneous translation into as many languages as possible.

6. **Overarching goal:** To identify and promote policies and practices that support sustainable forest-based livelihoods in the islands of the Caribbean based on sharing of stories, experiences and lessons learned.

7. **Themes:**
   a. Adaptive, collaborative, ecosystem-based approaches in forest management
   b. Forest-based livelihoods from abandoned agricultural estates
   c. Forests for poverty alleviation
   d. Valuation of ecosystem services and its role in forest management
   e. Climate change and forests in small islands

8. **Programme overview:** The conference will feature two days of meetings and one day of field trips, with a pre-conference one-day workshop for CBOs to share experiences and build capacity for participation in the conference. Each theme will be introduced via a plenary session, followed by a set of simultaneous breakout sessions, and wrapped up with a concluding plenary. The conference will culminate in a high-level session for policy-makers to present key policy messages drawn from the meeting. A poster exhibition will be run throughout the conference.

9. **Conference partners:** Food and Agricultural Organisation (FAO) National Forest Programme Facility, European Commission (EC) Programme on Tropical Forests

DETAILED OVERVIEW OF REGIONAL MEETING PROPOSAL

10. **Objectives:**
    a. to share lessons learnt from research, practices and policy initiatives about forest management arrangements that optimise the socio-economic benefits to the rural poor;
    b. to facilitate dialogue among stakeholders to:
        i. develop shared understanding and a coordinated approach to sustainable use and management of Caribbean forests to support sustainable livelihoods and poverty reduction;
        ii. enable and support effective participation of stakeholders in decision-making about the use and management of forests;
    c. facilitate dialogue among countries to contribute to the development of a shared regional approach on issues currently under focus on the national, regional and international agendas;
    d. to formulate key recommendations from the region for presentation at CBD COP 2010 and at the World Forest Commission, as well as presentation of structured messages to CARICOM, OAS and OECS.

11. **Outputs:**
    a. Production and dissemination of regional meeting report inclusive of abstracts of papers and recommendations
    b. Production and dissemination of position papers with key messages on regional issues for regional and international fora, including meetings of the Conference of the Parties to the Convention on Biological Diversity and the World Forestry Commission, the Organisation of American States (OAS), the Caribbean Community (CARICOM), and the Organisation of Eastern Caribbean States (OECS)

12. **Outcomes:**
    a. Enhanced understanding of, and appreciation for, methods and approaches to facilitate the effective involvement of stakeholders in the management of forest resources and the development of forest-based economic activities.
    b. New and strengthened networks comprising enhanced relationships among forest users and managers in the region across sectors and among local, national and international levels.
    c. Increased implementation of collaborative adaptive management regimes for forests that benefit livelihoods without compromising forest health.
    d. Acknowledgment of the value of abandoned estates and more productive use of abandoned lands.

e. New policies and projects that support the development of local forest-based enterprises; increase in the number of successful local forest-based enterprises.

f. Value of forests increasingly reflected in poverty reduction initiatives and decisions for national development.

g. More effective advocacy at regional and international forums on key regional issues.

13. **Content of themes:**

a. <u>Adaptive, collaborative, ecosystem-based approaches in forest management</u>
Forest management regimes in the region often reflect the historical choices about the "value" of forests, and resulted in a sectoral focus on timber production as the primary output from this sector. As a result, many actors in this sector are not fully up to date with newer management approaches. Ecosystem management, adaptive management, and participatory or collaborative management approaches have been developed to respond to the wider social, economic and ecological context for forest management in the 21st century, and a changing global climate. Yet, these new approaches are not being systematically applied in forest management in the Caribbean and a narrow view of management of forests within the often isolated, legally designated boundaries of existing forest reserves is common. The full range of state and private forests is often not being effectively managed for multiple purposes and in the wider landscape context recognising the needs of multiple sectors and the interests of various stakeholders. Forest management takes place in the absence of unit management plans at various scales: national, regional, and local. Forest policies, laws, rules and regulations are often outdated. They conflict with other sectoral policies and do not effectively link with national policies on social, physical and economic development. As part of this theme, CANARI will report on recent work facilitating participatory planning and policy development and research on environmental mainstreaming. This theme will be addressed by examining various questions including:

- What is the right scale for forest management planning? How can cross-scale management be achieved?
- How can issues of land tenure and multiple, competing interests be handled in an ecosystem management approach?
- How can management of the range of state forests be coordinated?
- How can management of private forests be facilitated and coordinated across ownerships and landscapes?
- How is forestry governance evolving in the Caribbean? Are forestry departments restructuring to respond to new approaches and needs, and if so, how? What new policies and innovative programmes are being developed?
- How can participatory processes enhance forest management? How are partners in civil society and the private sector getting involved?
- How can forest management more effectively support national development and the needs of other sectors?

b. <u>Opportunities for forest-based livelihoods from abandoned agricultural estates</u>
The history of the cultivation of large agricultural estates (sugar cane, cocoa, cotton and coconuts) in the Caribbean has left a landscape of abandoned or underutilized private estates across the region. Many of these lands have been left in fallow for a number of

years and are often riddled with conflicting tenures. They are commonly viewed as everybody's property and provide areas for the community to forage for fruits and herbs, to hunt and graze animals. Governments have resorted to using these lands for housing and little attention and/or no resources have been invested into exploring viable forest-based opportunities. This theme will explore challenges and opportunities from various perspectives including:

- What can be done in land use planning to facilitate effective use of abandoned agricultural land?
- What are the tenurial issues and potential common property or other arrangements?
- How can agricultural, forestry, tourism, and other sectors work together to take advantage of this opportunity to work towards economic and social development and poverty alleviation?

c. Forests for poverty alleviation

In many small island developing states of the Caribbean, commercial harvesting of timber and other forest products has become rare. Forest management administrations focus on the critical functions of forests in meeting basic needs (e.g. water and soil conservation) and the contribution of forest services to broader economic development and poverty alleviation goals. Consequently, management is most often concerned with issues such as watershed management, recreational use of forests, ecotourism, habitat protection and maintaining forest cover on private land. In the region, there is little acknowledgement of the value of forest in sustaining and potentially improving the quality of life of local communities. In instances where organised groups obtain a livelihood from forest, they are often encouraged to form voluntary organisations rather than business or cooperative models that might better facilitate the development of profitable forest-based enterprises. This theme will explore experiences and investigate issues in the sustainable use of forests to support livelihoods drawn from action learning and research projects implemented by CANARI and others in partnership with CBOs, including:

- What have been experiences of Caribbean communities and their partners with developing forest-based livelihoods?
- What policies, laws and structures need to be in place to enable sustainable forest-based livelihoods?
- Are forests providing key opportunities in poverty reduction strategies and programmes?

d. Valuation of ecosystem services and its role in forest management

Forests in the region provide multiple benefits through the production of goods (e.g. timber, wildlife, medicinal plants, and craft materials) and services (e.g. watershed protection, soil stabilisation, coastal protection, carbon sequestration). However, the paucity of data on the value and benefits that accrue from forest resources has contributed to the failure of decision makers and the wider public to recognise their importance to the economy and human well-being. In an environment of competing interests over land for the extractive and tourism industries, it could be argued that, rather than direct payment for ecosystem services, forest economic valuation serves a more important purpose when it is used to inform decision-making regarding land use and incentive structures. This theme will draw on recent CANARI research on payments for

watershed services and policy and management implications arising from valuation of forests in Montserrat. The theme will explore methods in the economic valuation of forests and the ecosystem services they provide, including:

- What do we know about the value of forest goods and services in the Caribbean?
- What are the issues in forest valuation in small Caribbean islands? What are some lessons about appropriate valuation methods?
- What are sustainable financing options for forest management?
- How can mechanisms be established to ensure that compensation flows to the vulnerable people providing the ecosystem services or suffering from lost opportunities?
- What are the opportunities and risks associated with carbon markets in the Caribbean?

e. <u>Climate change and forests in small islands</u>
In addition to the complex institutional landscape for forest management in the Caribbean, climate change and its impacts offer yet another challenge to the management of forest in the region. In some locations, increased intensity and frequency of storm and the changing flowering and fruiting seasons has lead to reactionary changes in forest management rather than the planned, strategic approaches needed to contribute to resilience of forests in the Caribbean. Under this theme CANARI will present the results of its recent collaborative research project to assess the impacts of climate change on forest biodiversity in the Caribbean, resulting impacts on forest-based livelihoods, and the resulting policy and research recommendations. Regional initiatives are at a preliminary stage and more attention needs to be given to innovative approaches such as the establishment of the biological corridor initiative. Issues discussed under this theme will include:

- What are the current and projected impacts of climate change impact on forests in the Caribbean?
- What will be the resulting impacts on forest-based livelihoods?
- What responses are needed at the policy level and on the ground to adapt to these changes?
- What is currently being done in the Caribbean to address these challenges?
- How can Reducing Emissions from Deforestation and Forest Degradation (REDD) and regional policy initiatives be applied in the Caribbean to best support livelihoods?