

NATURAL RESOURCES SYSTEMS PROGRAMME

FINAL TECHNICAL REPORT¹

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Project Title

Improving coastal livelihoods in the Caribbean: institutional and technical options

Project Leader

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Organisation

Caribbean Natural Resources Institute

NRSP Production System

Land-Water Interface

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Abbreviations and acronyms

CANARI: Caribbean Natural Resources Institute
CFG: Caribbean Focus Group
CZM: Coastal Zone Management
DFID: Department for International Development of the United Kingdom
DOF: Department of Fisheries
EC: European Commission
FTR: Final Technical Report
GCRMN: Global Coral Reef Monitoring Network
GIS: Geographical Information System
GPS: Global Positioning System
IDS: Institute of Development Studies
LCCU: Laborie Co-operative Credit Union
LDF: Laborie Development Foundation
LDPC: Laborie Development Planning Committee
LFCC: Laborie Fishers and Consumers Co-operative (formerly Laborie Fishermen's Co-operative)
LVC: Laborie Village Council
MPA: Marine Protected Area
MRAG: Marine Resources Assessment Group
NRSP: Natural Resources Systems Programme
PRSP: Poverty Reduction Strategy Paper
SLHTP: Saint Lucia Heritage Tourism Programme
SMMA: Soufriere Marine Management Area
UPS: Uptake Promotion Strategy

1. Executive summary

The purpose of this project was to test and develop institutional and technical options for the management of the use of coral reef resources that serve three essential, complementary and mutually-reinforcing requirements of sustainable development, namely: the generation of economic benefits, especially for the poor; the strengthening of participatory institutions; and the maintenance of ecosystem integrity. The direct outputs of the project include several articles, papers and reports. The main publication arising out of this project is the scientific annex (Annex A) to this Final Technical Report (FTR). The project has also produced two video documentaries (one forthcoming, the other part of a series broadcast on BBC World) and has generated a number of articles and reports in the local media. Its findings and recommendations have also been disseminated through a number of meetings and presentations, and will be available to the organisations involved in the implementation of the Uptake Promotion Strategy (UPS) that is currently being formulated by the Caribbean Focus Group (CFG).

The project was designed and implemented as a participatory process focusing on Laborie, a small community located on the southwest coast of Saint Lucia, West Indies. It involved a range of applied research and local development initiatives. The main activities were: (a) an initial phase of assessments and baseline studies, (b) four experiments and case studies focusing on coastal water pollution, tourism development, seaweed cultivation and sea urchin management, (c) a monitoring programme to assess change and impacts, and (d) a final phase to compile and analyse results, findings, lessons and conclusions.

The project has resulted in the identification and promotion of new and improved technologies and approaches. It has led to the establishment of new institutional arrangements in the project location, with increased participation in management by local resource users, increased involvement of local organisations in natural resource governance, and new partnerships among local and national partners. On the basis of these tangible local achievements, the project was able to extract a range of important lessons and conclusions which should be relevant and applicable to coastal management and development in other parts of the Caribbean region and the rest of the world.

The project has contributed to NRSP's objective to develop an improved understanding of integrated management opportunities and development options for natural resources important to the poor in coastal zones. It has done so by examining and identifying some of the institutional and technical options available to reef management outside of Marine Protected Areas, and by concluding that MPAs are not always the most desirable and suitable institutional arrangement. Interestingly, the project has also contributed, albeit in a modest way, to the identification of pollution issues affecting Caribbean coastal communities, and of some of the responses required to address these issues.

2. Background

The issues and opportunities addressed by this project can be found at three different levels. Firstly, this project responded to the need for specific tools and methods in two main areas:

- *participatory institutions*: the project aimed at testing, developing, refining and documenting methods that increase the effective participation of stakeholders in all stages of planning and management. It sought to identify some of the institutional options available to manage coastal resources and sustain coastal livelihoods in the Caribbean.
- *sustainable use*: the project also sought to explore and document technologies and management tools that can enhance the social and economic benefits derived from the sustainable use of coastal resources, and particularly from the reef fishery, sea urchin harvesting, seaweed cultivation and heritage tourism. Aware of the potential of these resources, and of the need to optimise their contribution to poverty reduction and sustainable livelihoods, the project aimed at identifying selected technical options, and at drawing more general lessons about the processes and approaches required to make these options beneficial to people, especially the poor.

Secondly and more ambitiously, the project sought to undertake an evaluation of the impact of participation on the sustainability of resource use and on the livelihoods of people. While it was recognised that time and resources available to this project would be too limited to undertake a comprehensive evaluation exercise, the project sought to identify and monitor concrete linkages between institutional and technological change on the one hand, and the well-being of both the people and the reefs on the other. In a way, the project hoped to be able to test some of the assumptions about participatory research and participatory planning.

Thirdly, the project aimed at providing guidance towards the identification of alternatives to Marine Protected Areas (MPAs). Throughout the developing tropical world, coastal conservation and development initiatives have tended to emphasise MPAs as the most appropriate conservation and management instrument. While it is true that these Areas have made and continue to make a significant contribution to biological conservation and sustainable development, it is now becoming increasingly evident that they are not appropriate to all circumstances. Typically, in Saint Lucia and other parts of the region, MPAs have been established in the coastal regions of greatest biological diversity and economic potential, especially in the tourism sector, while other coastal zones continue to suffer from inadequate management. There is therefore a need for management instruments that are suited to the conditions of coastal areas where the resource may not warrant, nor be able to support, MPAs.

This project originated from a call for concept notes issued by the Natural Resources Systems Programme (NRSP) of the Department for International Development (DFID) in July 1999. The Caribbean Natural Resources Institute (CANARI) decided to respond to this call because its on-going work in participatory and collaborative natural resource management in the Caribbean region had made it aware of the specific and expressed demands of resource managers and resource management agencies in Saint Lucia and the rest of the region. In this call, CANARI saw an excellent opportunity to conduct focused research that would help meet some of these demands for methods and tools capable of contributing to the establishment of participatory management regimes and the implementation of pro-poor approaches to natural resource management and coastal development.

In order to address these constraints and opportunities, the project focused on a small area known as Laborie, located on Saint Lucia's southwest coast. In accordance with the terms of the original call for concept notes, it focused on reefs and on livelihood strategies that depend, to some extent, on the use of these resources. This location was selected because it offered a site that is similar to and representative of many non-urban coastal communities in the insular Caribbean. Its reefs are well developed, but it is not one of the areas of exceptional beauty and diversity that would have justified the establishment of a traditional MPA. At the same time, its economy and its livelihood strategies were sufficiently varied, with significant issues of poverty, sustainability and equity, to allow for research on a diversity of resource use strategies and options.

In the design of the project, CANARI was also able to identify and respond to the specific needs of those who became its primary local partners in project implementation, namely the Department of Fisheries (DOF) in the Saint Lucia Ministry of Agriculture, Forestry and Fisheries and the Laborie Development Planning Committee (LDPC), an organisation that has since given birth to the Laborie Development Foundation (LDF). In the execution of their respective mandates, these organisations welcomed and embraced a participatory learning process that supported their national and local development initiatives and used them to inform theory and practice. They also saw this project as an excellent avenue for capacity-building, and they therefore contributed wholeheartedly to the research process.

The project built on previous work in a range of disciplines and on a range of topics. The main debates to which it sought to contribute concern the relationship between poverty and the environment, and approaches to coastal zone management. The project also came against the background of debates and discussions surrounding the rationale for, and practice of, participation. The project was informed by this context, and sought to contribute to these processes by providing the basis for a discussion and the presentation of the lessons it had learned. These ideas and conclusions are contained in the scientific annex to this FTR.

3. Project purpose

Against this background, the purpose of the project was to test and develop strategies for the management of the use of coral reef resources that serve three essential, complementary and mutually-reinforcing requirements of sustainable development, namely: the generation of economic benefits, the strengthening of community participation, and the maintenance of ecosystem integrity.

At the start of this project, the organisations involved and the individuals responsible for its design and management hoped to contribute to the following changes:

- At the local level, the project would contribute to a greater awareness of the issues and requirements of coastal management, the empowerment of people and organisations, the improvement of institutional arrangements towards increased participation and effectiveness, and the identification and promotion of forms of resource use that are sustainable and capable of bringing social and economic benefits to people, especially the poor.

- At the national level, it was expected that the project would inform and influence both the contents and the process of policy, particularly with respect to coastal zone management, MPA management, and resource user participation in policy formulation and governance.
- Regionally and globally, the project intended to produce lessons and conclusions that would be useful and relevant to colleagues and organisations involved in similar fields.

Overall, the expectation from this project was that it would provide a valuable case study of coastal management and development in a small Caribbean community, and that it would contribute to the identification and dissemination of options, approaches and methods for institutional design, sustainable use and participatory management.

4. Outputs

The results and findings of the project are many, and are presented in some detail in the scientific annex (Annex A) to this FTR. The main results can be grouped in the following categories:

- The baseline surveys and original assessments provided a good description of the area and its natural resources, and an understanding of the main livelihood strategies and issues affecting them.
- The project's main experiments and case studies provided detailed baselines of individual resources and sectors, and a large number of specific results. With respect to tourism, these results included a vision and programme for local tourism development, and an identification of the key requirements for pro-poor tourism in the project site. With respect to seaweed cultivation, the project determined the feasibility of the cultivation of a commercially important species, identified the issues affecting the development of the seaweed farming sector, identified the policy requirements for the further development of this new industry, and formulated a short-term action plan for the expansion of the sector. In sea urchin management, the project facilitated a participatory planning and management process that used both scientific and popular knowledge and involved a wide range of stakeholders. This resulted in a high level of voluntary compliance and in significant increases in the economic benefits derived from local harvests. In pollution control, the project identified the causes and sources of bacterial pollution, generated and disseminated valuable data to all relevant stakeholders, and provided the basis for local action to address the situation.
- Through all these activities, the project generated long-term processes that have been integrated into the structures and work plans of a number of local organisations, thus providing a basis for continuity and for future evaluation of changes and impacts over a longer time period.
- Project activities have provided the basis for the formulation of a number of points of discussion, with respect to the project's own methodology,

approaches to resource management, participatory planning, participatory research, local governance, institutional arrangements for coastal zone management, and the relationship between poverty and the environment. The discussion of project results and findings is presented in the scientific annex, and does not need to be repeated here.

The products coming out of this project are presented in the table below.

Target audience	Requirements from project	Media
Laborie residents and resource users, including schools	<p>Validation of and support to local sustainable practices</p> <p>Information on and demonstration of opportunities for development</p> <p>Analysis of and reflection on participation and local governance</p> <p>Opportunities for learning</p>	<p>Research Forum and research partnerships between research agencies and resource users (organised regularly as part of project, will require some form of continuation)</p> <p>Participatory analysis of project processes and findings (January to March 2003)</p> <p>Distribution of case studies and base line documents</p> <p>Placement of full collections of project documents in locations where they will be accessible (village library and all schools)</p> <p>Replacement of the four project panels by exhibits presenting key project results</p> <p>Brief public exhibition of all project materials, including the four panels mentioned above</p> <p>Presentations to organisations and special interest groups, using popular media when preferable and possible</p>
Organisations involved in supporting development work in Laborie	<p>Information on and demonstration of opportunities for development</p> <p>Concrete plans for resource management and development in specific sectors (tourism, seaweed cultivation, sea urchin, pollution control)</p> <p>Analysis of and reflection on participation and local governance</p>	<p>Research Forum (organised regularly as part of project, will require some form of continuation)</p> <p>Participatory analysis of project processes and findings (January to March 2003)</p> <p>Distribution of case studies and base line documents (done)</p> <p>Presentations to organisations and special interest groups (Village Council, Development Foundation, Fishers and Consumers Co-operative)</p> <p>Dissemination of seaweed cultivation development plan</p> <p>Dissemination of working paper on local governance</p> <p>Distribution of results of research on pollution (Village Council, Member of Parliament, Ministry of Health)</p>

¹ This document is an output from a project funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID.

Target audience	Requirements from project	Media
National organisations involved in coastal zone management, poverty reduction and related development work	Strategies for coastal management and development that benefit the poor Lessons and implications for policy	Preparation and distribution of working paper on local governance and use of that paper in the national PRSP and social development policy processes Video documentary on project process and results, focusing on sea urchin management Presentation of project results and policy implications to staff of relevant agencies, using video mentioned above and Power Point presentation Workshops (30-31 January) to share and compare lessons in sea urchin management between Barbados and Saint Lucia Distribution of project documents, and placement of these documents in National Documentation Centre and other libraries
Regional organisations involved in coastal zone management, poverty reduction and related development work	Methods for participatory planning and management Strategies for coastal management and development that benefit the poor Lessons and implications for policy	Published paper on seaweed farming, submitted to regional scientific journal Preparation of special issue of CANARI's Moss Bulletin and placement on CANARI's website Local production of video documentary on case study of sea urchin management
Training institutions and professionals involved in coastal management and development, participatory processes and research	Lessons, processes and methods used in and developed by the project	Scientific annex to the final report, with the possibility of turning this into a working paper or a book chapter and of contributing to a Caribbean book of NRSP project outputs, looking particularly at alternatives to protected areas Working paper (option of publishing in PLA Notes) on information management, based on functioning system in Laborie, with the possibility of submitting a paper to a journal at a later stage Published paper on sea urchin management, possibly based on comparison with Barbados, submitted to international scientific journal
All audiences	Main lessons learned with respect to the relationship between participation, coastal livelihoods and sustainability	Production of TVE/BBC World documentary on coastal livelihoods Local production of video documentary on case study of sea urchin management Complete bibliography of project outputs

5. Research activities

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Overview

The research activities conducted to achieve the outputs of the project are described in some detail in the scientific annex (Annex A) to this FTR. The project involved four main stages and processes:

- An initial assessment and preparation of baselines.
- The conduct of four main experiments and case studies.
- The design and conduct of a monitoring programme.
- The compilation and analysis of results, findings and conclusions, leading to the preparation of this FTR and its scientific annex.

The project employed and facilitated a participatory process based on active interaction between research activities, local development initiatives, and participatory learning. In order to gather data and relevant information, the project first accessed and used all published sources available, including publications, maps and statistical data available from other agencies. In its social surveys, the project primarily used purposive sampling, i.e. selecting people with information and knowledge relevant to the research question, with both questionnaires and guided interviews. The study and description of the natural systems and resources used a range of methods, including mapping, laboratory analysis and field sampling. In addition, the project relied on participant observation, especially to record the outcomes of processes that it had initiated and facilitated. Participant observation was used as the preferred method to monitor changes in institutions and governance.

Cultivation and marketing of seaweeds

The first experiment focused on the cultivation of edible seaweeds. The objectives of this experiment were to determine the feasibility of cultivating species of *Gracilaria* that are known to have market potential, to assess the economic feasibility of cultivation, and to identify the conditions under which the technology can be adopted as a means of income generation.

The experiment involved eight activities:

- A base line survey of the status of seaweed production in Saint Lucia and the rest of the region.
- A review of the information available on the response to cultivation of different species in the region, and the selection of species for testing in the project site.
- The testing of different propagation methods and materials.
- Collaboration with a commercial farmer in the project site in establishing cultivation trials in an existing farm.
- Discussions with appropriate individuals and organisations in transferring any new developments in technology.
- Monitoring the effectiveness of technology transfer.
- An analysis of the results emphasising lessons learned, including the policy implications of seaweed cultivation.
- The formulation of a short-term plan for the development of the industry.

Awareness of the impacts of sewage pollution

The second experiment aimed to study how increased awareness of, and access to, information on the status, causes and potential impacts of water pollution can contribute to a

change in behaviour, and to identify the processes by which these changes occur. This experiment began with a base line study that involved four components:

- Analysis of water samples for thermotolerant (i.e. faecal) coliform bacteria at 16 stations between June and September of 2001.
- A study of community perceptions of the status of water quality.
- A survey of the perceptions of management agencies.
- An analysis of the direct and indirect factors and conditions responsible for pollution.

The experiment itself involved six activities:

- The base line surveys described above.
- The periodic collection of data on water quality, with an identification of issues, trends and impacts.
- The dissemination of that information to project participants, through meetings of key stakeholders, and to key management agencies.
- The observation and recording of actions taken by management agencies with respect to the control of sewage pollution during the course of the experiment.
- A post-campaign survey of perceptions of management agencies.
- An analysis of lessons learned and results obtained.

Management options for the sea urchin harvest

The third experiment (renamed “case study”) focused on the management of the edible white-spined sea urchin, *Tripneustes ventricosus*, locally known as sea egg. Its objective was to determine how the harvest of the sea urchin could be managed to provide continued benefits to people. It involved the following activities:

- A review of the literature and of past experiences in sea urchin management in Saint Lucia and the rest of the region.
- A baseline survey of the stocks of sea urchins in the project area.
- A survey of key informants, focusing on history, traditions, perceptions, trends and expectations from management.
- Monitoring of stocks throughout the duration of the project, focusing on size frequency, abundance and location of stocks.
- Conduct of public awareness and mobilisation activities, including two public exhibitions and the use of mass media.
- Design and provision of support to a participatory planning and decision-making process facilitated by the Laborie Fishers and Consumers Co-operative and involving harvesters, community organisations and relevant governmental agencies.
- Provision of support to new marketing initiatives.
- Evaluation of the impacts of the harvest on the local community.

Options for tourism development

The fourth case study focused on tourism, and looked at ways in which marine and coastal based tourism could bring benefits to people, especially the poor. The project involved five activities:

- A base line study to describe the natural and human capital available in the community and to assess the impact of tourism on local livelihoods.

- A visioning exercise, looking at various options and models of tourism development, leading to the participatory definition of a vision and programme for tourism development for the locality.
- The promotion of access to information and knowledge by local stakeholders, through one workshop, one public lecture and panel discussion, and several one-on-one discussions.
- The design of institutional arrangements for local participation and leadership in tourism development.
- The establishment and maintenance of close contacts with the Saint Lucia Heritage Tourism Programme (SLHTP), an initiative of the Ministry of Tourism funded by the European Commission (EC) and the Government of Saint Lucia.

Analysis of results

Methods used for the analysis of results and findings included:

- Mapping.
- Constitution of computerised data sets.
- Tabulation and interpretation of results of questionnaires.
- Coding of interviews and field notes for themes and patterns.
- Workshops, small group discussions and meetings to share, confront and formulate additional results and conclusions.
- Informal discussions with stakeholders.

Expertise and resources

The project was managed by CANARI and implemented under the guidance of a local Steering Committee. It benefited from a range of human resources and expertise, including, but not limited to:

- A project leader and a researcher provided by CANARI.
- The involvement of several members of staff of the local Department of Fisheries (DOF).
- Guidance and support from Prof. Melissa Leach of the Institute of Development Studies (IDS).
- The participation of several local community leaders in a project Steering Committee, and in the design and conduct of a wide range of activities.
- The involvement of a number of people in many aspects of data collection and project implementation.

Stakeholder participation

Participation was part of all the methods used in the project, especially through:

- The involvement of the project Steering Committee in identifying research questions and in designing surveys and questionnaires.
- The involvement of a wide range of stakeholders in the selection of the actual topics and issues to be addressed in the project experiments and case studies, and in the definition of the focus of these activities.
- The use of local researchers to conduct interviews and to administer questionnaires.

- The distribution and discussion of emerging findings and results throughout the project, and the use of these results to define and frame emerging research questions, particularly through the Research Forum.
- The involvement of stakeholders in the interpretation and analysis of results.
- The constitution of a computerised data base and geographical information system that has allowed for easy access to data and information.

In addition, one of the main avenues for stakeholder participation in various aspects of the project was what was called the Research Forum, i.e. open meetings held at the village market square for the purpose of sharing research results, framing research questions and guiding the various planning and management processes in which the project was involved.

6. Environmental assessment

The project has undoubtedly enhanced environmental management at the project site, by demonstrating the benefits to be gained from management, by raising public awareness of the importance of the area's coastal resources and the issues affecting them, by enabling several local community development agencies to become more involved in natural resource governance issues, by improving the information base and setting up an effective and functional information management system, and by strengthening collaboration between local and national agencies.

Direct and tangible environmental benefits generated by the project include the maintenance of the newly-recovery stocks of sea urchins through sustainable harvesting practices, improvements in the management of local beaches, and alternatives to the harvesting of over-exploited natural populations of valuable seaweed species. It is however too early to be able to measure all the environmental benefits, but the project has initiated a number of processes that will be continued, and that are likely to have the following impacts on the local environment: improvements in water quality as a result of increased public sector investments, increased efficiency on the part of local and national agencies, and changes in the behaviour and practices of people; recovery of reefs as a result of an increased awareness of the effects of pollution on reef health, improved water quality and changes in local practices; and inclusion of Laborie Bay in a national programme to monitor changes in reef health.

The needs for follow-up action have been identified and are presented in the scientific annex. They include a succession plan to ensure the continuity and expansion of activities at the local level, as well as recommendations specifically directed to NRSP's Caribbean Focus Group and its Uptake Promotion Strategy.

7. Contribution of outputs

Through this project, NRSP sought to develop an improved understanding of integrated management opportunities and development options for natural resources important to the poor in coastal zones. The project has contributed to this objective by:

- Examining and identifying some of the institutional and technical options available to reef management outside of Marine Protected Areas, and concluding that MPAs are not always the most desirable and suitable institutional arrangement.
- Developing and documenting technologies and approaches that have a demonstrated potential to benefit people, especially the poor.
- Providing a valuable case study of participatory coastal resource governance, and a local site in which some of the activities can be continued and built upon.
- Providing specific lessons and observations related to participatory research and participatory planning, with the hope that these could be compared and integrated with results of other NRSP-sponsored projects in order to formulate generic guidelines, as part of the UPS.
- Formulating several hypotheses on the relationship between poverty and natural resource management in the coastal zone, and constituting a baseline and a set of data that can serve as the basis for the testing and studying of these hypotheses.
- Identifying specific policy requirements, particularly in relation to coastal aquaculture and community-based approaches and mechanisms for the management of open-access artisanal fisheries.
- Demonstrating the importance of designing research and development activities to address the needs identified and expressed by communities.

The project has also contributed, in a small way, to the identification of pollution issues affecting Caribbean coastal communities, and of some of the responses required to address these issues. The project noted that while the emphasis of studies on pollution of coastal systems in Saint Lucia has been on sedimentation resulting from soil erosion, the main concern of local stakeholders was a perceived increase in environmental degradation and pollution levels related to sewage influx into the Laborie Bay. The project therefore focused on this issue, and the high levels of bacterial contamination found in parts of the Bay confirmed the community's perceptions. By making the findings available to key management agencies, the project has provided the incentive and motivation for those agencies to investigate new approaches to sewage management aimed at reducing its impacts on inshore reefs and potential impacts on human health. It is possible that with the changes in agriculture in Saint Lucia and the rest of the region, the effects of siltation and agrochemicals may decline, while coastal communities continue to expand without adequate sewage treatment facilities, thus threatening their health and their potential for tourism development.

The project concentrated its efforts on its research activities and on the preparation of outputs. Aware that an Uptake Promotion Strategy was being developed that would encompass all relevant NRSP-sponsored projects in the Caribbean, it was decided that there was no need for the project to devote significant time and resources to uptake promotion and dissemination, and that this task would be more effectively handled in the context of the UPS.

The project therefore formulated the following suggestions and recommendations for this UPS:

- Development of guidelines and best practices based on results of several NRSP-funded projects in the Caribbean.
- Use of the project's experience in tourism as a teaching case study for regional universities.
- Provision of financial and technical support to a number of activities identified in the project's succession plan.

This succession plan includes the following activities:

- Institutional strengthening of the Laborie Development Foundation (LDF).
- Continuation and expansion of a coastal resource management and development programme under the auspices of the LDF, the Laborie Village Council (LVC) and the Laborie Fishers' and Consumers Co-operative (LFCC).
- Hosting of the Research Forum, and examination of opportunities for expanding its scope to other development issues and processes.
- Use of the Laborie experience to inform debates and decisions on local governance as part of national social development policy processes.
- Implementation of a project for pollution control and sewage management, assisted by the Ministry of Health. This will require identification of appropriate systems to reduce bacterial contamination of waste water, and ongoing monitoring to assess the effects of management interventions.
- Contribution of information on Laborie reefs from the Department of Fisheries' national monitoring programme to national and regional databases, and to the next GCRMN global status report on reefs to be published in 2004.
- Establishment of a working group (LFCC, LDF and DOF) to implement a seaweed cultivation development initiative.
- Capacity-building and integration of the LFCC as a key player in resource management, community development and sustainable livelihood generation.
- Implementation of the tourism development plan, under the auspices of the LDF, as described in the Strategic Development Plan for Laborie.

8. Publications and other communications materials

8.1 Books and book chapters

8.2 Journal articles

8.2.1 Peer reviewed and published

Renard, Y. 2002. Participation and coastal livelihoods. *Policy matters* 10:111-112.

8.2.2 Pending publication

8.2.3 Drafted

8.3 Institutional report series

8.4 Symposium, conference, workshop papers and posters

Renard, Y. 2001. NRSP/LWI project R7559. Improving coastal livelihoods: institutional and technical options. Paper presented at a *Workshop on Common Pool resources, Developing Management Strategies that can Benefit the Poor, NRSP, Heslington Campus, University of York, UK, October 2001*. [unpublished]

Renard, Y. 2002. Notes for discussion submitted to the NRSP workshop *Strategic Experience of Participatory Methods and Processes for the Improvement of Natural Resources Management. University of Reading, September, 2002*. [unpublished]

Renard, Y., Smith, A. and Krishnarayan, V. 2000. Do reefs matter? Coral reef conservation, sustainable livelihoods and poverty reduction in Laborie, St. Lucia. Paper presented at a *Regional conference on Managing Space for Sustainable Living in Small Island Developing States, Port of Spain, Trinidad and Tobago, October, 2000*. CANARI Communication No. 274:6 pp.

Smith, A.H. 2001. A study of coastal livelihoods in Laborie, St. Lucia – social, human and financial capital. How different resources are used and integrated into household strategies of different stakeholder groups (R7559). pp. 7-12 – 7-13. In: *Proceedings of the Workshop Improving the poverty focus of NRSP's Research on the Management of Natural Resources. Rothamsted, Harpenden, UK, November/December 2000*. DFID Natural Resources Systems Programme.

Smith, A.H. and Renard, Y. 2002. Seaweed cultivation as a livelihood in Caribbean coastal communities. Paper presented at the *ICRI Regional Workshop for the Tropical Americas: Improving Reef Condition Through Strategic Partnerships. Cancun, Mexico, June 2002*. CANARI Communication no 309:8 pp.

8.5 Newsletter articles

Article on project submitted to NRSP Highlights, due for publication in second quarter of 2003.

CANARI. 2003. The Caribbean moss bulletin 9. 2 pp.

Renard, Y. and Smith, A.H. 2003. Building the foundation for sustainable coastal conservation in the Caribbean. *Sea Grant in the Caribbean* [in press]

8.6 Academic theses

Hutchinson, G. 2002. *Sources, distribution and effects of faecal contamination in Laborie Bay, St. Lucia*. B.Sc (Hons) Thesis, Queen Mary and Westfield College, University of London, UK. 80 pp. [unpublished]

8.7 Extension-oriented leaflets, brochures and posters

Four information panels placed in prominent locations in Laborie village for the duration of the project

8.8 Manuals and guidelines

8.9 Media presentations

One of five examples of water management in a programme entitled Net Profits, produced by TVE for the BBC World Hands On series.

10 minute video on sea urchin management (forthcoming)

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Newspaper articles

8.10 Project reports and data records

8.10.1 Citation for the Final Technical Report (FTR), Annex A

CANARI. 2003. The Sea is our Garden: a report on a study of institutional and technical options for improving coastal livelihoods in Laborie, Saint Lucia. *CANARI Technical Report no. 322*. Vieux Fort, Saint Lucia: Caribbean Natural Resources Institute.

8.10.2 Project technical reports

Burt, M. 2002. A study of the social and economic impacts of sea urchin harvesting in 2002 in Laborie, St. Lucia. *CANARI LWI Project Document no. 7. CANARI Technical Report no. 318*. Vieux Fort, Saint Lucia: Caribbean Natural Resources Institute.

Buttler, C. 2002. Assessing marine resources: institutions and institutional development in Laborie, St. Lucia. *CANARI LWI Project Document no. 6. CANARI Technical Report no. 305*. Vieux Fort, Saint Lucia: Caribbean Natural Resources Institute.

Clauzel, S. and Joyeux, G.. 2001. Tourism in Laborie, St. Lucia: baseline study and identification of potential for development. *CANARI LWI Project Document no. 3. CANARI Technical Report no. 293*. Vieux Fort, Saint Lucia: Caribbean Natural Resources Institute.

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8.10.3 Literature reviews

8.10.4 Scoping studies

8.10.5 Datasets, software applications

Alphonse, U., Dominique, A. and Dubois, J. 2001. Results of a household survey of livelihoods in Laborie, Saint Lucia. Vieux Fort, Saint Lucia: Caribbean Natural Resources Institute. [unpublished]

Data on coral reef communities in Microsoft Excel distributed to regional data management centre at University of the West Indies, Jamaica.

Thematic layers based on airphotos and topographic maps in Map Maker GIS software.

¹ This document is an output from a project funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID.

8.10.6 Project web site and/or other project related web addresses

Project highlighted on the CANARI web site at <http://www.canari.org/proj.html> during second half of project period.

10. Project logframe

Narrative summary	Objectively verifiable indicators	Means of verification	Important assumptions
Goal			
Improved resource-use strategies in coastal zone production systems developed and promoted.	<p>By 2002, new approaches to integrated natural resource management and prevention of pollution which explicitly benefit the poor validated in two targeted areas</p> <p>By 2004, these new approaches incorporated into strategies for the management of coastal resources and adopted by target institutions in two targeted countries.</p>	<p>Reviews by Programme Manager.</p> <p>Reports of research team and collaborating / target institutions.</p> <p>Appropriate dissemination products.</p> <p>Local national and international statistical data.</p> <p>Data collected and collated by the Programme Manager.</p>	<p>Target beneficiaries adopt and use strategies.</p> <p>Enabling environment exists.</p> <p>Budgets and programmes of target institutions are sufficient and well managed.</p>
Purpose			
Technical understanding and methods for management of coastal zone habitats improved	<p>New technologies for sustainable resource use are applied in at least five coastal communities in the region</p> <p>Participatory institutional arrangements are in place in the project site</p>	<p>Field surveys and reviews</p> <p>Monitoring data on reef status and uses</p> <p>Project reports</p>	<p>Policy environment allows for the establishment of new institutional arrangements</p> <p>Natural disasters do not prevent the conduct of field experiments and extension</p>
Outputs			
1. Methods for participatory planning and management in small coastal communities tested and documented	<p>By the end of year 2, a range of participatory planning methods tested and documented</p> <p>By the end of project, new institutional arrangements in place in at least one project location</p>	<p>Reports</p> <p>Training materials</p> <p>Community strategic plans</p> <p>Sectoral development plans</p> <p>Management agreements</p>	<p>Readiness of the host community to conduct broad participatory planning processes</p> <p>Willingness of formal resource management and development agencies to participate in process</p>
2. Technologies for sustainable resource use identified, tested and refined	<p>By the end of year 1, detailed work plans prepared for at least three experiments</p> <p>By the end of the project, results of at least three experiments documented, and available for dissemination</p>	<p>Field reviews</p> <p>Project reports</p>	<p>Natural disasters do not prevent the conduct of field experiments and extension</p>
3. Methods and technologies for enhancing coastal livelihoods while reducing coral reef degradation disseminated	<p>By the end of project, learning from outputs 1 and 2 used in publications and training programmes of CANARI and IDS</p>	<p>Training schedule and notices</p> <p>Reports</p> <p>Publications</p>	

4. Capacity of research institutions involved in participatory natural resource management for sustainable development enhanced	Throughout project, effective relationship established between IDS and CANARI	Project reports	
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Narrative summary	Project milestones	Important assumptions
<i>Activities</i>		
1. Detailed research design and training of personnel (all outputs)	Seminars held with IDS, CANARI, host government agencies and community representatives Report produced and shared with stakeholders by month 4	
2. Identification and analysis of stakeholders (outputs 1 and 2)		
3. Conduct of a participatory assessment of livelihood resources (output 1)	Community workshops held, literature reviews completed, reports on strengths and weaknesses produced by month 6	
4. Conduct of a participatory review of institutional landscape (output 1)	Workshops held, studies done, and report produced by month 6 Field work completed and report produced by month 9	
5. Establishment of a baseline on the status of reef resources, including benthic community structure and status of harvested species (outputs 1 and 2)	Field work completed and report produced by month 9	
6. Study of historical and current uses, issues of tenure and access, and pre-existing management arrangements (outputs 1 and 2)	Workshop held and report produced by PM9	
7. Workshop to analyse data and assessments and design experiments (output 1)		
8. Conduct of research and provision of extension services in support of resource management (selected target species) and seaweed cultivation (output 2)	On-going activities, beginning at month 7, involving on-site training, technical assistance, field experiments, with initial work plans and six-monthly progress reports Six-monthly evaluation studies Regular collection and treatment of data, redistribution to community and management agencies	Readiness of two host communities to conduct broad participatory planning processes
9. Monitoring and evaluation of the social and economic impact of these management and cultivation activities (output 2)		
10. Monitoring of the status of reef resources (outputs 1 and 2)	Monitoring data gathered at regular intervals, and redistributed to relevant stakeholders	

Activities continued	Project milestones continued	Important assumptions
<p>11. Analysis of the relationship between participatory planning and management activities and trends in the status of reef resources (outputs 1 and 2)</p> <p>12. Distribution of research results to stakeholders in both locations (outputs 1, 2 and 3)</p> <p>13. Synthesis of research results (output 3)</p> <p>14. Use of research results in on-going training and advocacy programmes of CANARI and IDS (output 3)</p> <p>15. Conduct of seminars, during project implementation, to provide training to researchers, and review research methods and results (outputs 3 and 4)</p> <p>16. On-going collaboration between CANARI and IDS in the design and conduct of research activities (output 4)</p>	<p>Participatory exercise to summarise and interpret monitoring data, and compare it with trends in other locations. Conduct of specific studies, during year 3, to investigate the linkages between management activities and trends</p> <p>On-going distribution of results through public meetings, publications and reports</p> <p>Report</p> <p>Preparation and use of case studies, guidelines and other materials in years 2 and 3</p> <p>Seminars at project initiation, ends of years 1 and 2, and end of project</p> <p>Sharing of materials and resource people. Conceptual back-up to project provided by IDS on on-going basis</p>	

11. Keywords

Note: these keywords follow the Aquatic Sciences and Fisheries Information System and the United Nations Macrothesaurus.

coral reefs, reef fisheries, seaweed culture, echinoderm fisheries, tourism development, marine pollution, resources management, mapping, Caribbean, Saint Lucia

12. Annexes

Annex A (scientific annex): CANARI. 2003. *The Sea is our Garden: a report on a study of institutional and technical options for improving coastal livelihoods in Laborie, Saint Lucia. CANARI Technical Report no. 322.* Vieux Fort, Saint Lucia: Caribbean Natural Resources Institute. 139 pp.

Annex B: Final project inventory.

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