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**Organisation**

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**SCIENTIFIC ANNEX A**

**OPPORTUNITIES AND CONSTRAINTS FOR COASTAL  
LIVELIHOODS IN THE CARIBBEAN  
(R7797)**

**TECHNICAL REPORT OF  
TEAM ACTIVITIES AND FINDINGS**

***PART I - REPORT TEXT***

by

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## Executive Summary

This report (Part I - Text; Part II - Appendices) provides an account of the Natural Resources Systems Programme - Land Water Interface (NRSP-LWI) project 'Opportunities and Constraints for Coastal Livelihoods in the Caribbean', which was carried out by staff of the Natural Resources Institute (NRI, UK), Caribbean Coastal Area Management Foundation (CCAM, Jamaica) and Environment Tobago (ET, Tobago) between July 2000 and June 2001.

The document describes the conceptual framework of the study and the broad methodology adopted. A set of six strata was developed representing different levels of the natural, human and social processes in the coastal zone. These strata (from the base upwards) were: the natural resource base, the extracted resource, extraction methods, the human resource, informal social interactions and formal social interactions. Twelve questions relevant to these strata were then posed to determine how much published information was available on each stratum.

The development of the database to collate and analyse publications, indicators and project information of relevance to the Caribbean coastal zone is then described. The availability of publications on issues raised by Caribbean colleagues as being of importance in the region was assessed according to the strata defined in the project concept. A wide range of key words and concepts was developed, and key references from the database considered for their coverage of these areas.

A series of indicators for particular facets of island or national livelihoods was developed - some derived from information directly available in a variety of databases; some obtained by creating complex indices through mapping one against another.

A group of senior Caribbean representatives who agreed to assist in ensuring the relevance of the project to Caribbean needs (an electronic, therefore 'Virtual' Steering Group) was then asked to rank a range of issues raised by themselves and other Caribbean personnel according to regional, national and local importance. These rankings were later compared with information arising from discussions in the two community studies undertaken by the project.

Two areas had been chosen at the beginning of the project - part of a large island and a small island - to represent two of the three physiographic types in the Wider Caribbean. The large island component was Portland Bight in southern Jamaica, where the Caribbean Coastal Area Management Foundation, (CCAM), led by Peter Espeut, was a project partner. The 'small island' was the whole island of Tobago, where Environment Tobago, led by Kamau Akili, was a partner. These groups assisted in the creation of questionnaires and the organisation of questioning 48 and 32 local community representatives respectively, on their status and views of the future of the coastal zone and its resources. The results from the questionnaires were analysed and later validated at workshops attended by representatives of the communities in Jamaica and Tobago.

Finally the results from the project (concept, database, community analyses and validations, and suggestions for future researchable constraints to be addressed) were presented to a 2-day regional workshop in Barbados. This was organised by the NRSP Programme Management and attended by DFID Caribbean staff and many key regional groups and national representatives. The primary recommendations were:

- consideration of a blend of regional, national and local projects;
- more holistic approaches to research, rather than concentrating on natural resource issues;
- more emphasis on the human resource base in relation to natural resources;

- carrying capacity studies on both systems and thematic issues;
- social and economic inclusion of coastal communities during research;
- development of more appropriate coastal poverty indicators.
- attention to scalability.
- more emphasis on the human resource base in relation to natural resources;

Subsidiary recommendations in the form of suggestions from the Caribbean for particular topics were also included.

The main project findings were incorporated into plans within the NRSP-LWI for future research calls. Copies of the prototype database were distributed to some of the key participants at the workshop, and a copy is attached to Part II (Appendices) of this report.

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## **Acknowledgements**

We would like to thank the members of the Virtual Steering Group in the Caribbean for their guidance during the project, and, in several cases for their contributions to the information in the database.

Detailed acknowledgement of database material is incorporated in the database itself.

Discussions with many colleagues in Belize, St Lucia, Jamaica, Trinidad, Tobago and Barbados, with DFID and FCO staff, and with NRSP Programme Management have all helped to shape the output. Dr Arthur Potts of Tobago House of Assembly provided project guidance in Tobago, and Ms Lia van Broekhoven assisted with questionnaire design in UK.

Dr Margaret Quin, Programme Manager of NRSP, and Dr Chris Mees, LWI manager, have been helpful with support and constructive criticism throughout.

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## SECTION 1. BACKGROUND

The UK Government funded Natural Resources Systems Programme (NRSP) wished to enhance the relevance of its research on resource-use strategies in coastal zone production systems in the Caribbean to the needs of coastal communities, and to foster closer relationships with regional research collaborators.

It therefore funded the Natural Resources Institute (NRI) in UK, and through them the Caribbean Coastal Area Management (CCAM) Foundation in Jamaica and Environment Tobago (ET) in Tobago, to investigate opportunities and constraints for coastal Caribbean livelihoods under its Land-Water Interface (LWI) production system.

This work took place between July 2000 and June 2001. It included the creation of a database of Caribbean publications, indicators and projects, and tested the coverage of elements of the data contained in it to coastal community livelihoods by discussions with communities in Jamaica and Tobago.

Several key groups and individuals in the region agreed to collaborate in steering the project through an electronic 'Virtual' Steering Group' (VSG), which included representatives of OECS/NRMU, CARICOM, UWI, UNEP and FAO. (For list of acronyms see Appendix 1).

Validation of the ideas developed during the database creation phase and in discussions with regional, national and local Caribbean representatives were tested using guided questionnaires in a number of coastal communities in Jamaica and Tobago. The results were analysed and discussed with local community representatives, then presented at a regional workshop for DFID, NRSP and Caribbean representatives in Barbados on 14-15 June 2001.

The basic idea of this project is that of a validated literature search. This report covers

- the conceptual background for project planning (Section 2);
- the processes and methods involved (Section 3)
- the formation of a senior Caribbean representative group and identifying some of the key issues which needed to be addressed (Section 4);
- the development of a regionally relevant database of previously published literature, indicator data and project reports (Section 5);
- identification of which areas of work had been less well covered than was thought useful (Section 5);
- participatory work with Caribbean NGO partners on a large island and small island to find out whether the issues raised were in fact relevant to the livelihoods of the coastal communities (Section 6 & 7);
- a discussion of potential pitfalls in the interpretation of some of the results (Section 8); and
- the provision to DFID and NRSP of validated suggestions of researchable constraints to Caribbean livelihoods which could be considered for inclusion in the next round of research projects funded under the NRSP land water interface (LWI) programme (Section 9).

## SECTION 2. CONCEPTUAL FRAMEWORK

The myriad of activities in the coastal regions of Caribbean countries vary in space, in time and frequency, in intensity, and in their relative influence on the coastline. In order to capture the range of livelihoods, their available resources, and the social, personal and natural opportunities and constraints to improve these livelihoods, a conceptual framework was developed by the project team. This framework could then be added to or improved through the Virtual Steering Group (See Section 4), and compared with the quantity and nature of reference material available.

The diagrams below (Figures 2.1 and 2.2) summarise the conceptual model of opportunities and constraints. It depends upon 6 major themes, or resources, based upon an extended version of the DfID's own 4 sources of "capital" (DfID White Paper, 1997).

1. There is the *potential resource or ecosystem*, which is the natural resource that is available.
2. People extract certain resources for use, so the second box is termed the *extracted resource*. Hence, sand may be seen as a potential resource, but aggregate is the extracted resource.
3. The *activities* which go on are a third category.
4. The *nature of the individual* forms the fourth box.
5. Above here are two closely linked boxes, representing the social capital. This is divided into two closely linked groups. This project focuses on the *informal or localised groupings of family or community*.
6. The top box relating to *formal institutional relationships* will be dealt with in more detail under a separate project.

Certain sectors are key to activities in the coastal region. For this model they were identified as agriculture, forestry, fisheries, environmental conservation, urban, industrial, service industry and administration. For example, in fisheries, the potential resource is all the fish, but the extracted resources are the economically viable or controlled species. The activities are fishing (artisanal or commercial) and the individual fisherfolk (either land or boat based) are the human resource. They then group into families, dependent on fisheries or co-operatives and trade unions, and there are key formal institutions such as the Ministry of Agriculture and Finance Departments. Similar pathways could be identified for all other activity sectors.

Sectoral definition of activity does not fully describe the level of activity and livelihood opportunity, for two reasons. Many people have dual or multiple occupancies as individuals, and also the family or community groupings may support each other through a range of occupancies and resource utilisation. Finally, there is not only the direct extraction or utilisation of resource that affects the system, but there are the by-products of resource use (such as effluents or pollution) which can adversely affect other parts of the coastal livelihood system.

Running through the model are three dimensions - space, scale and time - on which the activities takes place. Within the dimension of physical space, activity can be concentrated close to a coastline, towards the ocean, towards the interior or throughout the system - a continuum between the land water interface. Within the scale dimension, some of the phenomena described can take place at a micro scale, on the level of a household or over a small area. Others are localised to a community or bay, while some may be on a national or international scale. Some activities are short term; others are long term processes, so the temporal aspect needs to be considered in terms of periodicity, frequency, trend, cycle or one off event.

Finally, the psychological or physical nature of risk needs to be assessed. To what extent does an individual have complete control over the resources available, and what are the nature of the physical (climate change, hurricane, loss of stock) or human (financial, political) constraints and risks? Furthermore, from where do the opportunities for sustainable alternative livelihoods come?

The diagrams below try to cover the multi-dimensionality, multi-sectoral and inter-linked nature of resource, activity, livelihood and social infrastructure.

With assistance from the VSG and regular revisits to our model, the boxes and their positions have been updated since first conception. The literature review will attempt to equate how we perceive the model of coastal livelihood opportunities and constraints with the extent they have been studied in the available literature, and to see, particularly, whether those references deal with single issues, or linkages between the smaller and larger boxes.

A series of 12 questions was then developed to assist in determining the information needed at each level. These were:

**Box 1**

1. What (Where) is the potential of the support ecosystem (resource amount and quality - e.g. productivity, vulnerability - and intrinsic value)?

**Box 2**

2. What (Where) are the quantities, qualities and types of resources extracted?
3. What is the relative importance of the different resources extracted?
4. What are acceptable/sustainable levels of extraction?

**Box 3**

5. What (Who? Where) is producing the pressure (large /small scale, technological level)?
6. What is the nature of pressure on these resources?

**Box 4**

7. Where are poor people who depend on coastal resources (in broad terms)?
8. How poor are they? (What is the measure of poverty?, e.g. vulnerability)
9. To what degree do they depend on those resources?

**Box 5**

10. What (stakeholder) groups are active and in what way?
11. What cultural influences and informal institutions (family groups, village committee, local organisations) help or hinder key stakeholders?

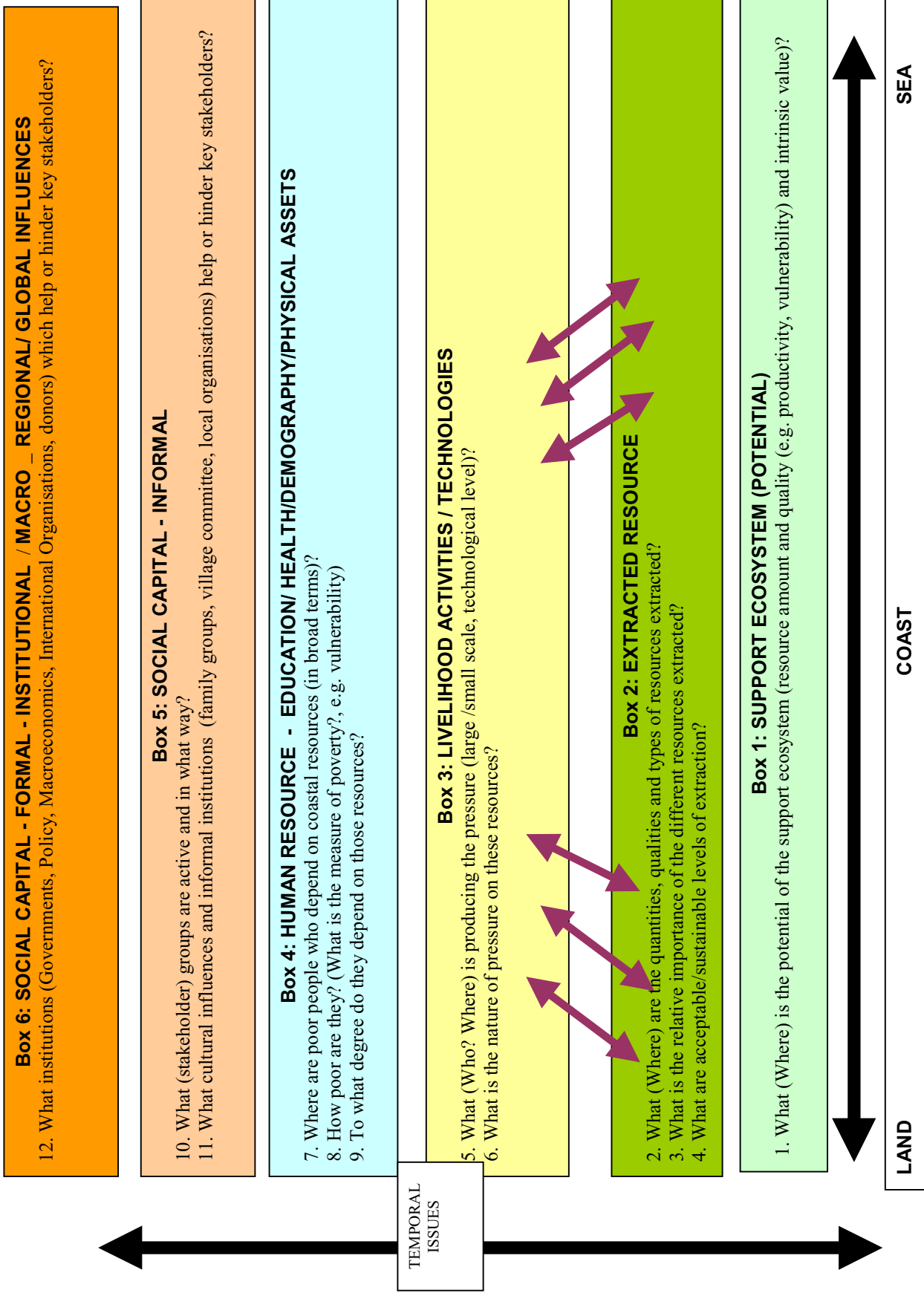
**Box 6**

12. What institutions (governments, policy, macroeconomics, international organisations, donors) which help or hinder key stakeholders?

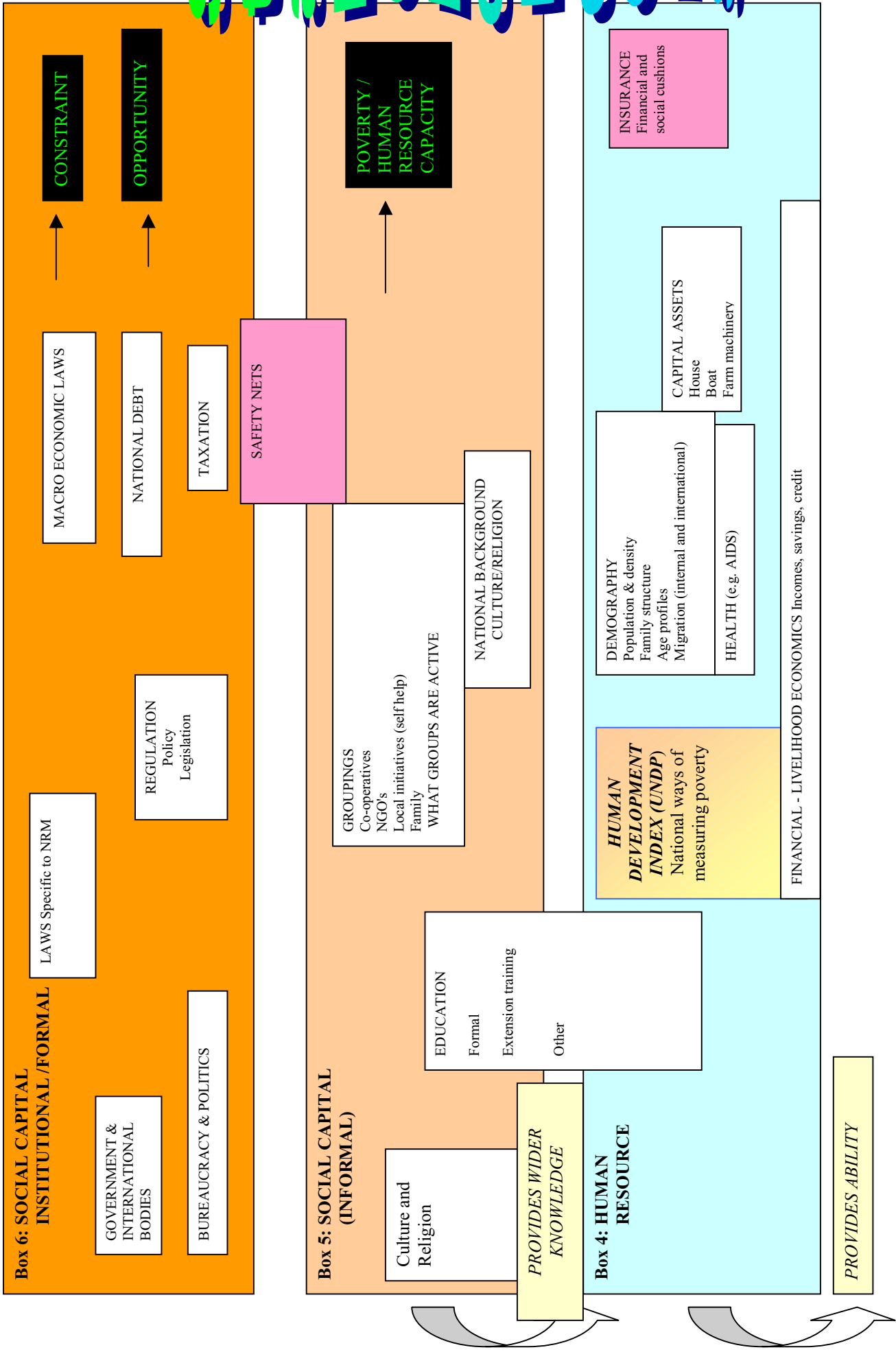
Figure 2.1 shows the six boxes mentioned above, with the 12 questions, located as relevant within the boxes to clarify our areas of content:

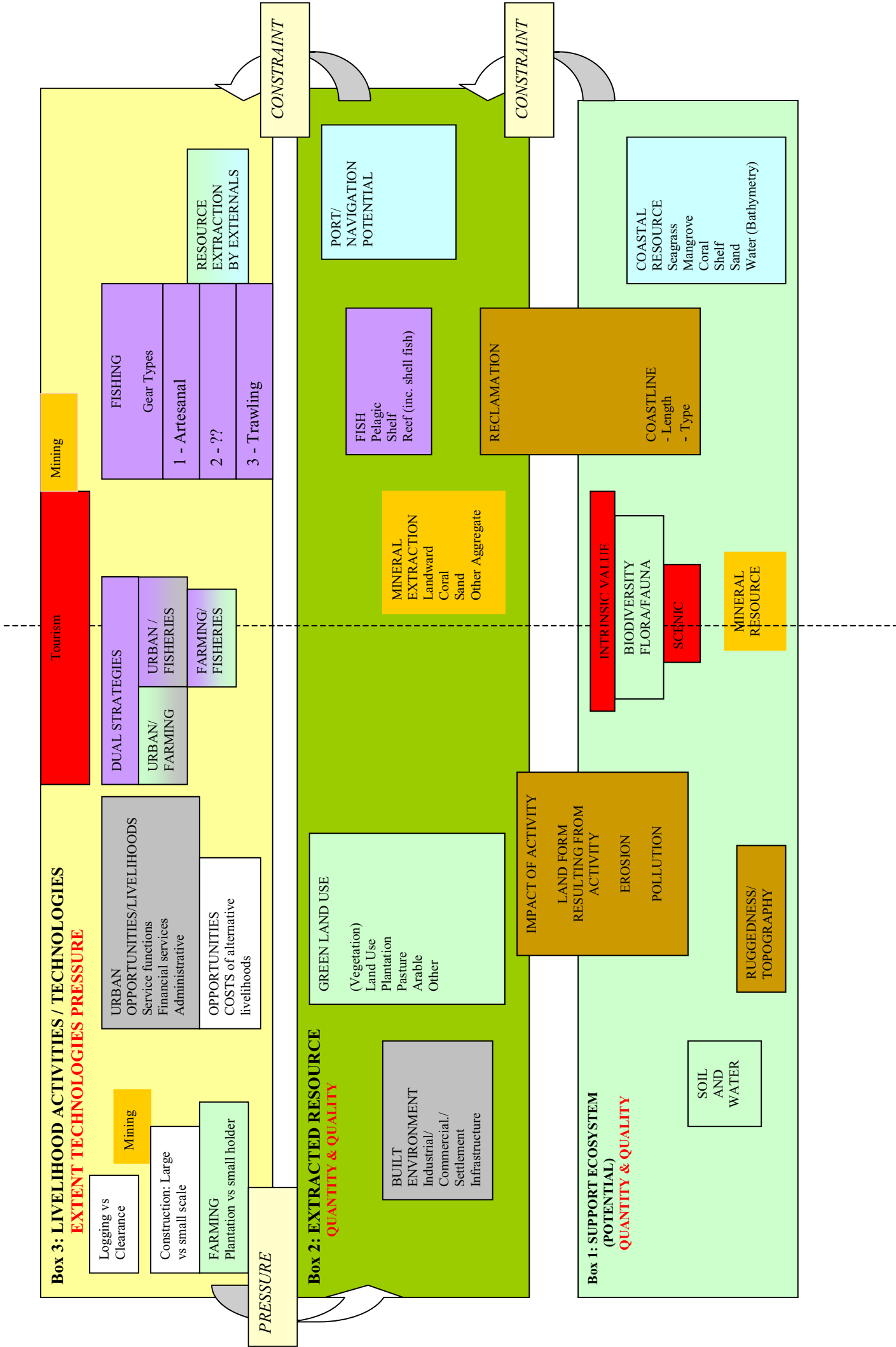
Figure 2.2 then indicates individual topic headings and the different linkages between them within the 6 main boxes.





# STAKEHOLDERS





## SECTION 3. METHODS

Only methods pertinent to the general philosophy of the project will be considered in this section. More detailed comment on the methods used are discussed in the sections relevant to the particular method.

### DATABASE METHODOLOGY

After creation of a preliminary database format (in MS<sup>®</sup> Access), the next step involved checking other databases for references containing certain key words. This was largely a desk-based exercise in the UK. A list of 340 key words was first produced by combining the key terms from the original Caribbean databases (collected during a visit by NRI staff to the region early in the project) and additional words that the Project Team felt appropriate. From this list 105 key words were selected that would adequately “catch” all the relevant bibliographic research literature (see Table 3.1 below).

The 105 key words were categorised into primary (13), secondary (20) and tertiary (72) key words. The primary key words were either important generic words (such as 'coast' and 'marine') or important specific words to the project (such as 'livelihood' and 'sustainable'). The secondary and tertiary key words were a collection of significant other generic or project specific key words. Although the primary word search would have “caught” most of the literature because of the generic nature of the terms, the secondary and tertiary key words were available to ensure that the database captured all relevant literature.

**Table 3.1: Primary, Secondary and Tertiary key words used for LWI Search String (105) - all prefixed by 'Caribbean'**

Access	Earthquake	Infrastructure	<i>Participat*</i>	<i>Seagrass</i>
Alternative	<b>Economic</b>	Intrusion	Planning	Security
<i>Aquaculture</i>	Education	<i>Island</i>	Plantation	Set back
Artisanal	<i>El Nino</i>	Labour	Policy	Settlement
Biodiversity	<i>Empowerment</i>	<b>Landuse</b>	Politic*	<i>Shellfish</i>
Climate	<b>Environ*</b>	Law	<i>Pollution</i>	Ship*
<b>Coast*</b>	Erosion	Leadership	Population	Shoreline
Community	Family	Legislation	Port	<b>Social</b>
Commuting	Farming	<b>Livelihood</b>	<b>Poverty</b>	Soil
Conflict	<i>Fish*</i>	<i>Lobster</i>	Protected	<b>Subsistence</b>
Conservation	Food	<i>Mangrove</i>	<i>Reef</i>	<b>Sustainability</b>
Co-operative	Forest	Map	Regional	Taxation
<i>Coral</i>	Gender	<i>Mariculture</i>	Religion	Technolog*
Credit	Gleaning	<b>Marine</b>	Resort	Tenur*
<b>CRM</b>	Health	Migration	Resourc*	Topography
<b>CZM</b>	Horticulture	Mineral	Risk	<b>Tourism</b>
Debt	<i>Hurricane</i>	Mining	<b>Rural</b>	Tsunami
Demography	Income	<b>MPA</b>	Sanitation	Urban
Disaster	Indicator	NGO	Saving	Village
Donor	Indigenous	Nutrition	Scale	Water
<i>Dredging</i>	Industrial	Oil	<i>Sea level rise</i>	Yachting

Coast\* = truncated word (see below)

The primary key words were used initially to search 8 of the most commonly used databases in the UK and in the USA (with an additional seven database sources searched later in the

project). A list of these databases with brief details of the literature they cover can be found in Table 3.2. In order to carry out the searches each primary key word was combined with the word Caribbean. Thus a search string example would be “MPA and Caribbean” This ensured that literature collected was Caribbean specific. Where appropriate, the truncation symbol (\*) was used to substitute for a string of zero or more characters. For example, coast\* retrieves literature covering coast, coastal, coastline, etc.

**Table 3.2: Databases used and brief details of database coverage.**

<b>Database Name</b>	<b>Brief Details of Database</b>
<b>GeoBase (1980-2000)</b>	From Elsevier/Geo Abstracts covering 300, journals and 5000 periodicals
<b>GeoRef (1785-2000)</b>	From American Geological Institutes geoscience database covering 2.2 million records
<b>Sociological Abstracts (1963-2000)</b>	From Cambridge Scientific Abstracts covering 2500 Journals from 55 countries
<b>ZETOC</b>	From the British Library covering 15 million articles and conference proceedings
<b>Agris (1975-2000)</b>	From the UN on International Systems for Agricultural Sciences and Technology
<b>Agricola (1970-2000)</b>	From the National Agricultural Library (US)
<b>FSTA (1969-2000)</b>	Covering 1800 publications from over 40 countries
<b>Science Citation Index (1981-2000)</b>	From the Institute of Scientific Information, Manchester University covering 5700 major journals across 164 scientific disciplines as well as 3300 of the worlds leading journals
<b>Organisation of Eastern Caribbean States</b>	Over 400 selected from a larger database
<b>Caribbean Natural Resources Institute (CANARI)</b>	30 key references
<b>Caribbean Conservation</b>	c. 1000 records
<b>UWI Mona Geography</b>	c. 500 records
<b>NRI library</b>	c. 40 records
<b>Institute of Marine Affairs</b>	400 references taken from a database of c.4000 references
<b>Internet searches</b>	Searched on the Internet for over 100 references

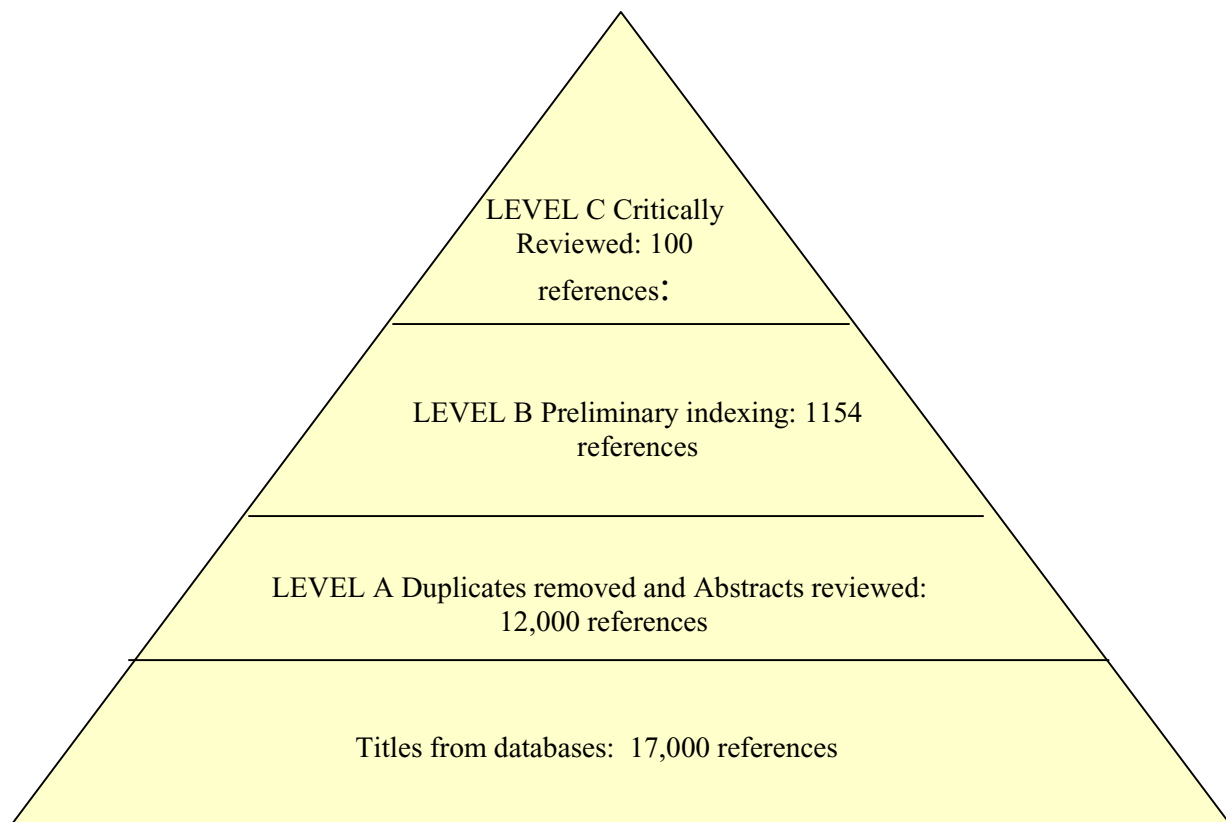
Using just the primary key words, over 13,000 records were collected from the above databases. Information collected for each reference included author, date of publication, title, citation, source, abstract and URL (if available). These records have been combined with other regional databases and grey literature (see above for sources), personal hard copies and project literature, to create a project database with nearly 17000 entries. Secondary and tertiary key words have also been used to search the databases but have not been entered into the project database. A break down of “number of records collected” - more than 130,000 - from individual databases for each key word can be found in Appendix 2.

A visualisation of the pyramid of sifting is given below.

**Table 3.3/Figure 3.1  
Operations on references:**

<b>OPERATION</b>	<b>LEVEL</b>
Preliminary entry into database	LEVEL A
Totals of country/region	LEVEL A

Totals of Keywords (occurring in title, abstract, review or free/fixed keys).	LEVEL A
Documentation of questions	LEVEL B
Review of abstracts	LEVEL B
Review of documents	LEVEL C
Standardisation of references	LEVEL C



## COMMUNITY FIELD WORK METHODOLOGY

The objective of the community field work was to:

- identify community perceptions with regards to poverty and vulnerability of the coastal livelihoods and hence serve as validation for the regional analyses.

Official statistics do not distinguish between the coastal and inland situations. As this project is particularly concerned with opportunities and constraints amongst coastal dwellers this represents a serious problem and hence the need to collect primary data<sup>1</sup>.

Statistics do point to marked differences in asset levels and household/individual access at a national level. The purpose of this report is to investigate these with regard to coastal dwellers (see results on indicators, Section 5C). The aim of this is to build a picture of livelihoods and household well-being before assessing vulnerability and concerns, and how these can be

<sup>1</sup> This need is further reinforced by the sampling strategy for national statistics i.e. based on providing significant results at this level only and when broken down into more local units the results are not statistically significant.

addressed by NRSP/others within a livelihoods framework<sup>2</sup> such as the one adopted here (see conceptual framework, Section 3).

Jamaica and Tobago were chosen as examples of a large and a small island to provide additional depth, a local snapshot in time, to the regional study through collection and analysis of primary data from coastal communities across a range of occupational groups in coastal areas. This provided a sense of the breadth of priority issues and inter-connections within these communities.

#### **Field study areas:**

Initially, communities at the centre of proposed coastal protected areas were chosen (Speyside, Tobago and Old Harbour Bay, Portland Bight Protected Area) as these provided both an initial strong source of secondary information and motivated local partners. In addition it was felt important that the field studies in turn would be able to feed back potentially valuable information into these management processes.

The study communities are shown in Figures 3.2 A & B. Sites within roughly the same scale of overall coastal area were chosen to provide a range of coastal conditions - from isolated fishing villages to areas with easier urban access. This also gave a range of employment and environmental conditions (and so opportunities and constraints to livelihoods), but was not necessarily absolutely representative of the Caribbean. This would have been impossible on this scale of study.

**Fig 3.2A Jamaica (large Caribbean island):** All the communities are within the proposed Portland Bight Protected Area on the south coast just west of Kingston, straddling the parishes of Clarendon and St Catherine. Of the fishing communities, Portland Cottage is the most remote, Hellshire is a popular day-trip beach from Kingston. Old Harbour Bay is a major fish-landing site, and Cockpit lies behind coastal wetlands. Bushy Park is farther inland close to the highway into Kingston. Portland Bight has some reefs, healthy stands of mangrove, and seagrass areas. Apart from some unique coastal woodland hills the land is under sugar plantations and holds several bauxite processing plants. Portland Bight itself has two major industrial ports.

**Fig 3.2B Tobago (small Caribbean island):** whole island view, with a focus on Speyside. Charlottesville is the most remote area. Buccoo and Bon Accord are communities close to the relatively urban Scarborough and tourist development areas around the airport. No major inland sites were available. Overall Tobago is relatively well forested with the oldest Forest Protected Area in the Caribbean.

#### **Preparation and Scoping**

Two non-government organisations active in the two study areas and working on both environmental and wider sustainable development issues were partners in the project. They were involved in scoping issues and identifying key locally relevant documents, identifying stakeholders, arranging and leading meetings and conducting stakeholder interviews. In Tobago, Environment Tobago, with support from the Fisheries Department of the Tobago House of Assembly (THA) provided this overall coordination, while in Jamaica this was provided by the Caribbean Coastal Area Management Foundation (CCAM).

Local secondary information was gathered as background information, local project activities, development plans, studies and surveys of the area.

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<sup>2</sup> Concentrating on asset enhancement and convertability.

Community meetings were held between December 2000 and February 2001 to initiate the field surveys. Based on initial secondary information and discussions with key institutions, posters were developed (using simplified conceptual frameworks) identifying issues and stakeholders, which were validated in the initial meetings with community members. In Jamaica existing processes run by CCAM with civic and fishers' councils were used, whereas in Tobago, due to elections, smaller and individual meetings had to be used. These validated stakeholder groups and key issues were used in the design of the questionnaires, interviews and subsequent results analysis (see Section 6 & Appendix 2A/2B). Additional interviews were held with key institutional stakeholders to strengthen the analysis of results.

### **Interview groups**

Following initial stakeholder consultations in Jamaica and Tobago sampling was based on identified and important occupation groups. Using a hybrid structured/semi-structured questionnaire (see Appendix 2) a total of 32 individuals were interviewed in Tobago and 48 in Jamaica between February and April 2001. The sampling approach across group and country is summarised in Figure 3.3. The group selection, and the numbers within each group, were used to find a representative selection of coastal livelihoods covering both direct and indirect natural resource base users. The weighting given to each was determined by the stakeholder consultations, and clearly indicates important variations between the two countries.

Individuals within the groups were selected on a random basis until the sampling quotas for each group and location were met. Details of this sample and the exact geographical locations are contained in Appendix 2. Due to the small numbers involved in this field investigation (caused by resource constraints) it was not possible to further sub-divide this into gender and age<sup>3</sup> which may have introduced some unintentional bias.

### **Validation**

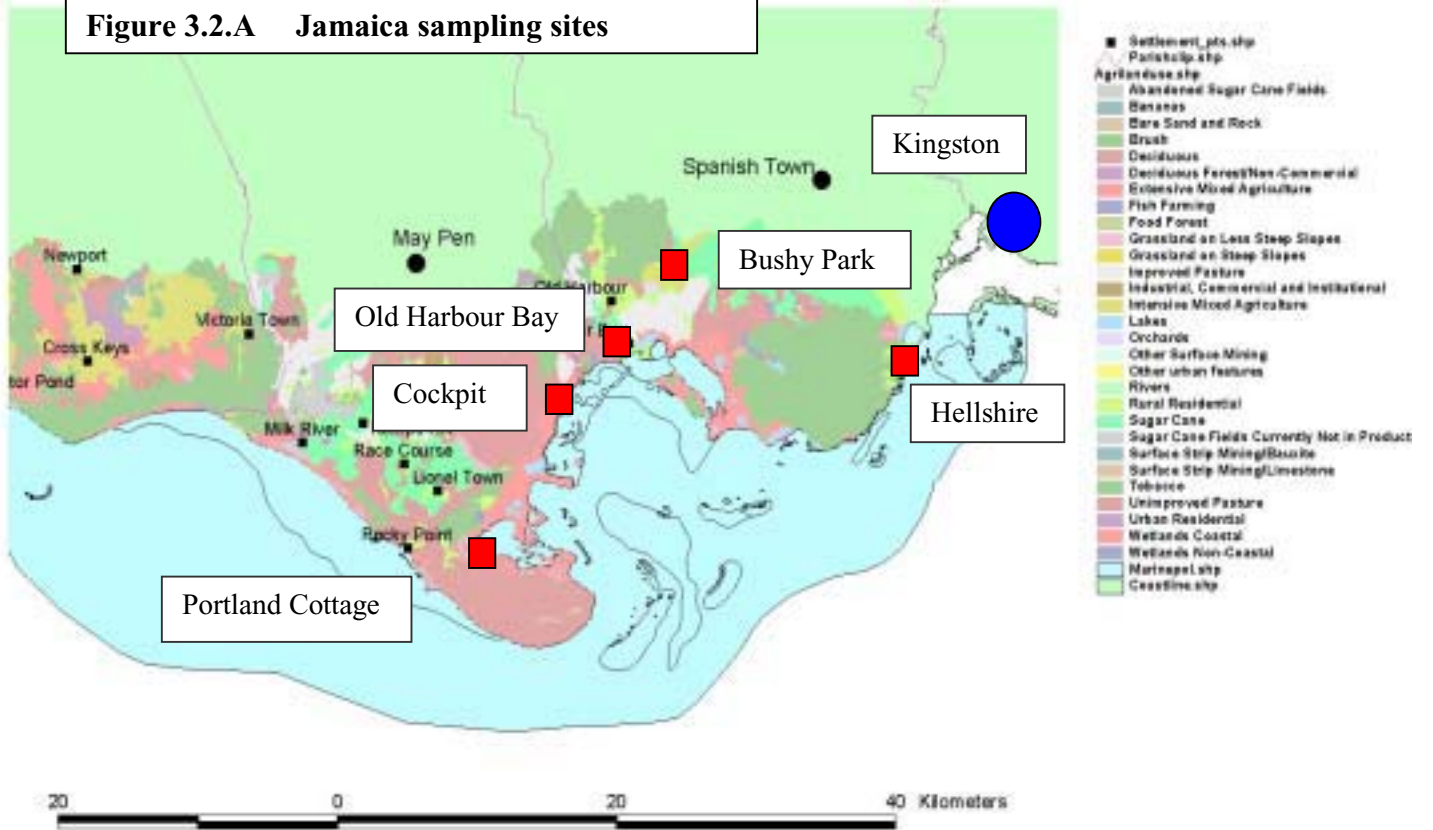
Results were presented to stakeholder group meetings in Jamaica and Tobago for feedback (see Section 7).

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<sup>3</sup> Of 48 interviews in Jamaica, 28 were with men and 20 women. In Tobago of 32 interviews, 28 were with men and only 4 with women. There were wide and fairly even variations in the ages of people interviewed with those under 50 accounting for most. The average age of interviewees was: 35.51 (Jamaica) and 43.06 (Tobago).

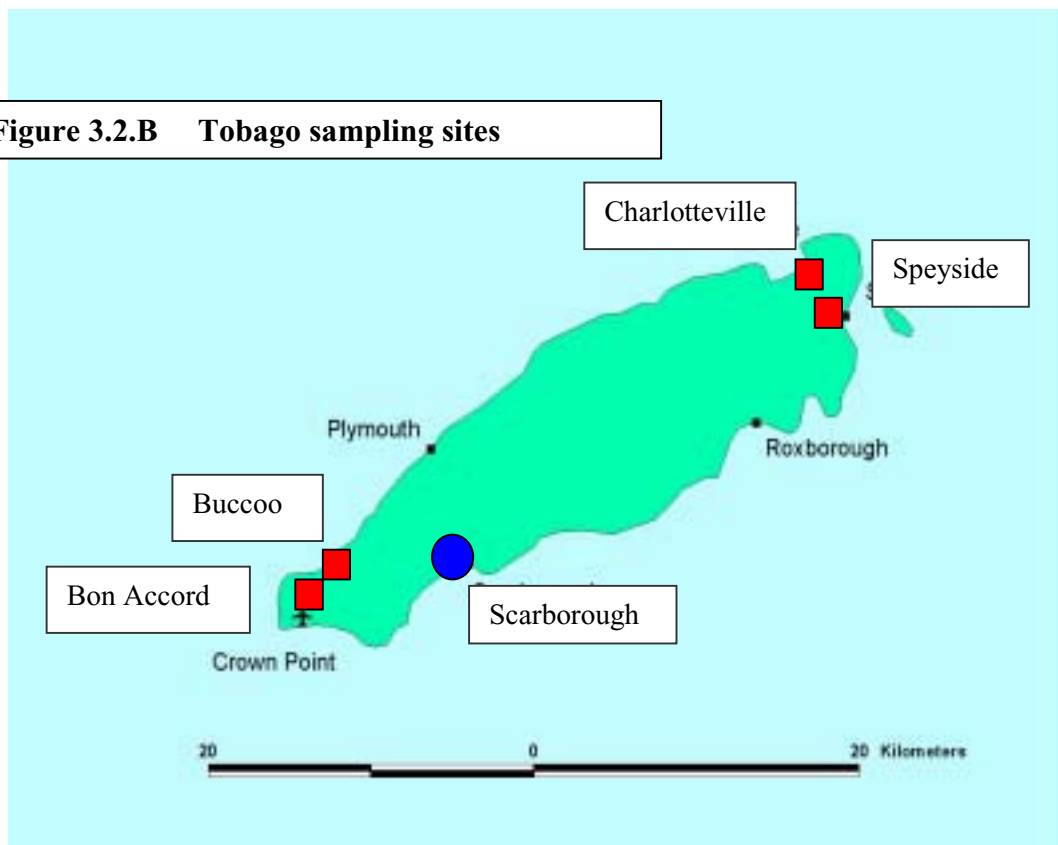


**Figure 3.2.A Jamaica sampling sites**

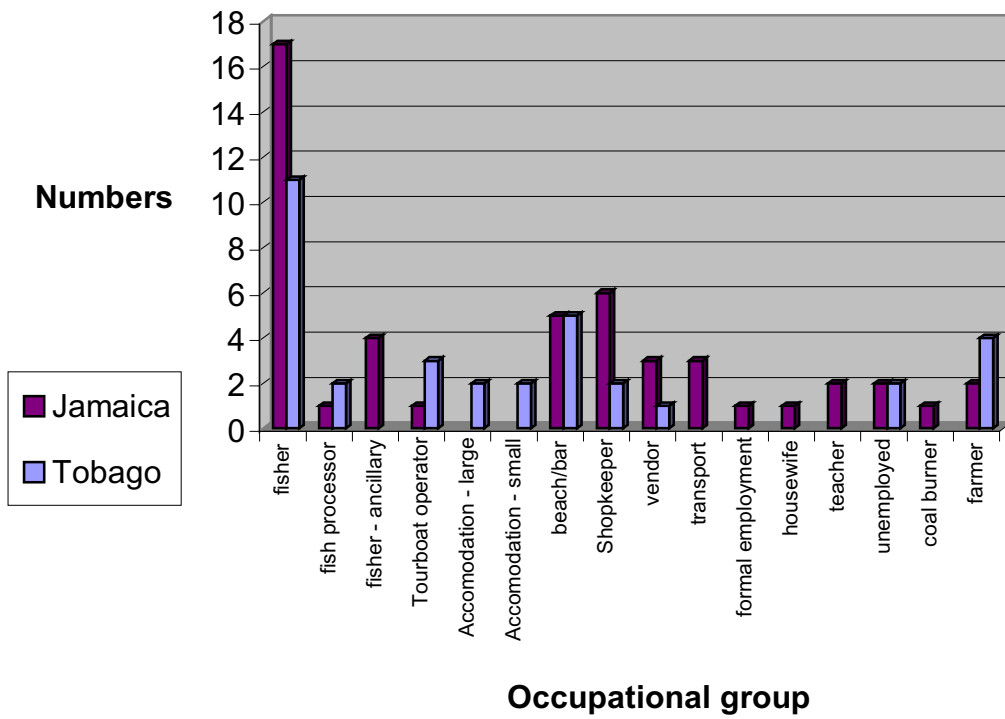


Source: South Coast Sustainable Development Project, Halcrow

**Figure 3.2.B Tobago sampling sites**



**Figure 3.3 Numbers sampled in occupational groups**



## SECTION 4. VIRTUAL STEERING GROUP

The concept for an electronic 'Virtual' Steering Group for the project arose because of the team's acceptance that a very wide range of topics are of concern to coastal Caribbean community members, and that an individual's views are likely to reflect primarily their own conditions and experience. It would have been unrealistic for UK-based personnel to hope to identify all the key issues of relevance to coastal communities from the other side of the Atlantic Ocean. Even the leaders of CCAM and ET (both NGOs) in Jamaica and Tobago would have views of priorities that were not necessarily in accordance with those of other groups.

As part of project preparation a group of senior Caribbean representatives was approached and asked whether, subject to time availability, they would be willing to participate in the project by providing guidance on its activities as the programme developed. In addition, several senior personnel were met and asked to join the group in the early stages of the project during the first project visit to the region by NRI staff. It was anticipated that perhaps only half the VSG members might be able to respond to queries on any particular point, but that this level of interest and guidance would be highly relevant in keeping the project heading in appropriate directions.

Our intention with the group was to try and ensure that we had scientific, technical and managerial skills covering as wide a range of stakeholders in the Caribbean coastal zone as possible. The initially proposed VSG membership was:

Mr F McDonald, NRCA, Jamaica (regional/managerial/technical)

Dr V Chase, OECS/NRMU, St Lucia (Eastern Caribbean/managerial/technical)

Mr K Aiken, UWI, Mona, Jamaica (academic/fisheries)

Dr D Pantin, UWI, Cave Hill, Barbados (academic/socio-economic)

Mr W Anderson, UWI, Cave Hill (academic/legal)

Dr H Oxenford, UWI, Cave Hill (academic/environmental)

Mr B Chakalall, FAO, Barbados (regional/fisheries)

Ms A Vanzella-Khouri, UNEP, Jamaica (regional/environmental)

Ms K Ford-Warner, CTO, Barbados (regional/tourism)

Dr M Haughton, CARICOM/CFRAMP, Belize (regional/fisheries)

Several of these nominees agreed to participate and assist before the project was initiated.

Many others were apprised of the project and its aims in the early stages. These included Prof E Thomas-Hope, UWI, Mona; Mr K Nichols and Mr P Murray of NRMU/OECS; Ms B Bowland OECS, Mr D Hickman of ENCAP-D at OECS, and Dr N Trotz, Mr L Walling & Mr I King of CPACC. The donor perspective was supplemented through discussions with Dr D P Weisel (USAID, Jamaica), Dr S Stone (IDB, Jamaica) and Mr G Glover (BHC, Jamaica).

Some senior personnel felt unable to assist (because of potentially conflicting loyalties, such as Mr Y Renard, CANARI, St Lucia); and some were kept informed as a matter of course (including Mr R Beales, DFID Caribbean, Barbados; Mr C Price, DFID, UK; Mr I Orr, FCO; Dr A Tollervey, DFID HQ Overseas Territories Advisor; Dr M Quin of NRSP, UK and Dr C Mees, NRSP/LWI, UK).

Finally team partners Mr P Espeut, Mr K Akili and Dr A C Potts played an active role in commenting at all stages

During early visits to the Caribbean, members of the VSG and others suggested areas of interest for community livelihoods that the project should consider. Twelve of these were

passed back to the VSG members who were asked to rank them for regional, national and local importance. The questions posed are given below:

- Enforcement – do the laws, if applied, prevent people from making a fair living?
- Co-management (empowerment) – is this something that is always effective?
- Migration (long term commuting) & remittances – a labour problem or economic necessity?
- Tourism vs fisheries conflicts – is either fully sustainable as practised?
- Pollution (land: litter/eutrophication/pesticides, and sea: oil/nuclear) – big problem?
- Smuggling – an important international problem? Controls?
- Short term responses to long term issues (eg climate change) – any harm in these?
- Vulnerability of population sectors – which sectors; what alternatives?
- Carrying capacities (eg for tourism or fishing) – are measurements adequate?
- Large island/small island relationships – family bickering or major feuds?
- Access and property rights - should hotels be allowed to prevent beachfront access?
- High volume vs low volume tourism (big hotels vs home stays) – is smaller always better?
- Others not included above?

The results of these ranking exercises were discussed during the validation exercises (see Section 7) and also during the final Regional Workshop in Barbados.

## SECTION 5. GENERAL LITERATURE REVIEW

### 5A. RESULTS FROM LITERATURE SEARCH

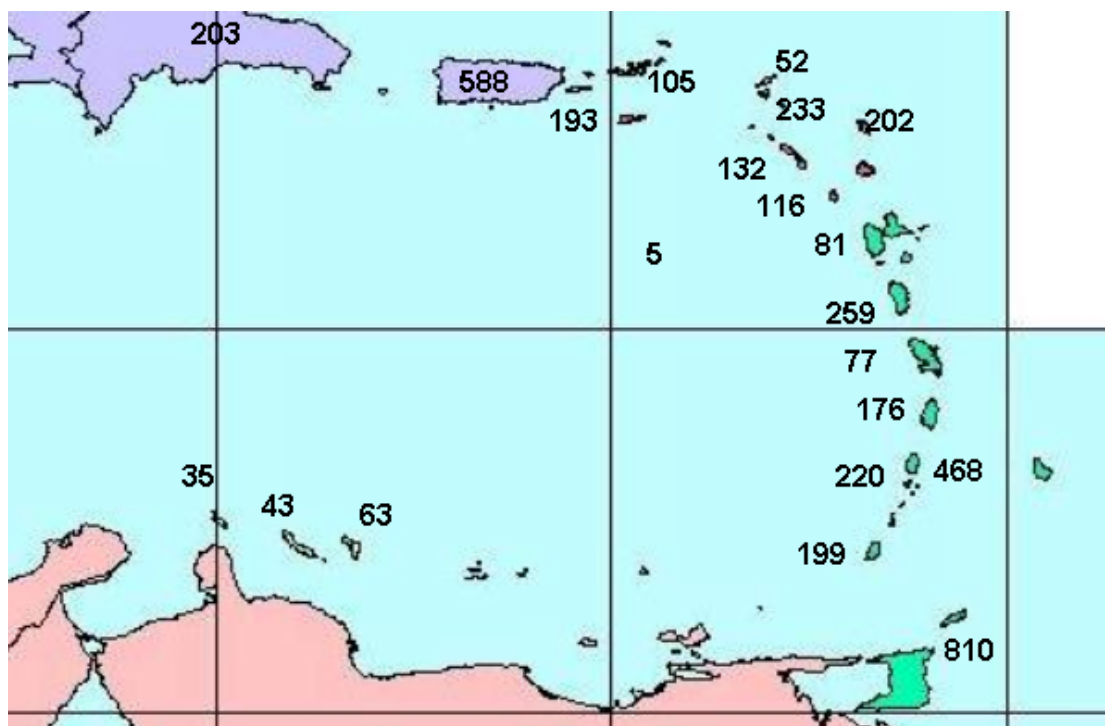
#### LEVEL A RESULTS

##### Country

From a search in title, abstract, keywords and review, each reference was flagged to the country or countries to which it related. If the reference was more generally applicable to a region or the whole Caribbean, these were flagged separately. The references attempt to cover the Wider Caribbean Region but countries on the periphery (e.g. Suriname, USA, ) are not as well covered. The databases searched resulted in a predominance of English language references, which means Spanish, French and Dutch-speaking territories are probably under-represented. Finally, there may also be bias towards the countries with institutes that were contacted within the project (Barbados, Jamaica, Trinidad and Tobago, Belize, St Lucia).

With these provisos, the pattern of references by country generally reflects the size of the country (population), although some countries with unusually large numbers of references also have university campuses. Other territories (e.g. Bahamas and BVI) have exceptionally high numbers of references in proportion with their total populations.





### Keywords

The table below gives an indication of the number of times a key word occurs in the title, abstract, review, or key word lists in the whole database (one or more times in one reference is counted as one record). A "\*" means that a word and its derivatives would have been searched for (e.g. coast\* would also pick up coastal).

Major patterns reveal that major, broad issues are covered very well (coast, economic, environment), but some specific issues are scarcely covered at all.

Important keywords such as 'livelihoods' hardly occur (33 times) but this may be because it is a recently used term in the literature. Other socially based keywords (such as 'community', 'indigenous') have relatively few keywords compared to resource based keywords.

Access	121
Alternative	137
Aquaculture	49
Artisanal	26
Biodiversity	79
Climate	168
Coast*	1136
Community	436
Commuting	1
Conflict	132
Conservation	270
Co-operative	11
Coral	578

Credit	32
CRM	1
CZM	5
Debt	36
Demography	24
Disaster	53
Donor	23
Dredging	21
Earthquake	73
Economic	1578
Education	351
El Nino	10
Empowerment	22

Environ*	1534
Erosion	158
Family	203
Farming	92
Fish*	644
Food	151
Forest	232
Gender	143
Gleaning	1
Health	272
Horticulture	1
Hurricane	97
Income	141

Indicator	125
Indigenous	60
Industrial	195
Infrastructure	58
Intrusion	15
Island	1157
Labour	81
Landuse	3
Law	141
Leadership	24
Legislation	123
Livelihood	33
Lobster	48
Mangrove	174
Map	194
Mariculture	22
Marine	1119
Migration	240
Mineral	418
Mining	85
MPA	18
NGO	33
Nutrition	34
Oil	261
Participat*	229
Planning	272
Plantation	103
Policy	470
Politic*	544
Pollution	239
Population	528

Port	210
Poverty	109
Protected	114
Reef	812
Regional	351
Religion	45
Resort	22
Resourc*	829
Risk	116
Rural	123
Sanitation	23
Saving	12
Scale	120
Sea level rise	22
Seagrass	79
Security	48
Set back	2
Settlement	114
Shellfish	26

Ship*	56
Shoreline	40
Social	998
Soil	169
Subsistence	24
Sustainability	47
Taxation	6
Technolog*	142
Tenur*	38
Topography	39
Tourism	308
Tsunami	15
Urban	160
Village	48
Water	941
Yachting	2

## LEVEL B RESULTS

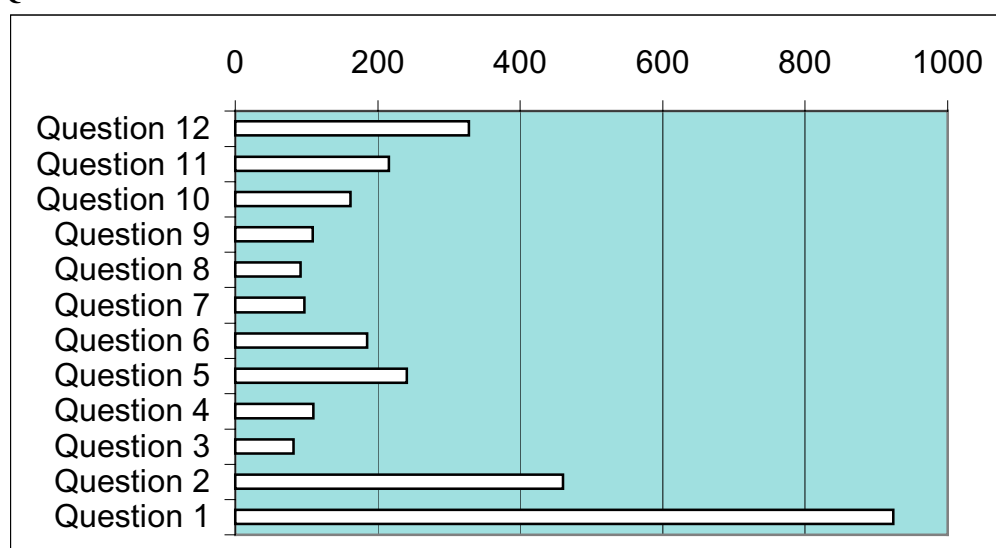
By trawling all 12000 abstracts and titles, a series of around a thousand references have some stronger relevance to livelihood strategies and natural resource management in the Caribbean Land Water Interface. A general summary of how these references deal with the broad conceptual boxes reveals a preponderance of references in the potential and extracted resources.

**Table 5.4 - totals by the 6 major boxes.**

Box 6: Formal social capital	326
Box 5: Informal social capital	374
Box 4: Individual livelihoods	345
Box 3: Activities	422
Box 2: Extracted Resource	646
Box 1: Potential Resource	922

While there remains a large number of references dealing with activities, the proportion of references dealing with informal and formal social capital has declined. This is probably because the references dealing particularly with formal capital are more national in scope, and this trawling has filtered many of these out as non-coastal. However, by splitting the references into the 12 questions, the following picture emerges.

### Questions



The skew towards both social capital and natural resource is again apparent, (Questions 1,2,10,11 and 12), with a slight increase where activities are described (Question 5). The other questions have very low totals.

When considering the overall keyword search for all references (LEVEL A), and the above selections of data for the trawled list (LEVEL B), the major trends are the apparent skews in the number of references to do with the potential and extracted resource, or to the formal social capital.

The major limitations of this key word approach are involves the allocation of a word to a particular box (1-6). This is a very blunt instrument, so that they can be correctly placed in terms of the published resource. Also, the search is only picking up single words or phrases, and we cannot show from such a cursory glance the context in which these key words are



being used. In the conceptual framework, the key terms may be identified in more than one area (e.g. 'coral' is both a potential resource and an extracted resource - how many of the 1752 references can be placed in each box?). Second, the indexers of abstracts or bibliographical databases such as these may not have specific expertise in the areas where cataloguing is taking place, and hence the key words may not be well used or understood, and more obscure terms (e.g. 'seagrass' or 'mariculture', may not be picked up as keywords despite being important to the reference). This will tend to skew in favour of the more generic terms, perhaps explaining why 'economic' (13,108) and 'environment' (7,911) have such large numbers. There is no linkage between key terms in this kind of review, hence we cannot assess from this search whether there have been any studies on the effect of the fishing industry on community opportunities.

Despite these many limitations, this survey provides a useful first glance at the countless references that have some bearing on opportunities and constraints on coastal livelihoods in the Caribbean.

The review of abstracts and critical review of papers overcomes these limitations but for far fewer references.

## **RESULTS FROM ABSTRACTS AND REVIEW PAPERS**

### **Abstracts and critical reviews**

The 5-digit numbers which appear for references relate to the ID number in the electronic database. This section attempts to step through the major issues defined by the conceptual model in Section 3 from Box 1 to Box 6, highlighting the type of work that has been done in these areas. (Numbers in brackets refer to the database reference numbers. The references used in this section are provided in alphabetical order in Appendix 7, and in numerical order in the database attached to Part II of this report).

### **Box 1: SUPPLY ECOSYSTEM**

#### ***Understanding the natural resources and biological processes***

In many of the references, despite long histories of research both ecological systems as a whole and their component parts are not fully understood even now. Although many practitioners of coastal zone management would argue that enough has been spent on research and implementation, education, awareness raising and infrastructural or institutional capacity building should be encouraged, it is apparent from several sectors that we really do not understand enough about the underlying processes. This was highlighted for UK dependent territories both from the point of view of pure inventory and in process (Oldfield and Sheppard, 1997). While inventories of islands have been done in some cases (1952) these need to be updated routinely as and when finances allow. Many other islands do not even have more than basic hearsay knowledge of their coastal resources, let alone the dynamic flows of tidal ranges (19947 has the current state of knowledge of the state of the sea in the Caribbean). Some case studies exist of tidal flows, watershed inputs and outputs, but they are on a case-by-case basis and there is little comparative information across islands or continental areas. Some studies of mangrove, seagrass, coral and sand communities exist, and there are similar ones on beach, land and watershed systems, but there are very few of watershed/coast linkages. Studies on marine surveys are known (e.g.19193).

### ***Seagrass***

There are relatively few articles that deal with seagrass alone, but some exist on the ecology and the associated communities in seagrass beds (19328, 19585, 19928). More often, linkages between seagrass and other resources are made (19563).

### ***Coral***

The number of articles relating to coral reefs in the Caribbean is much larger. There are several papers which discuss the structure of corals or their growth rates (13781) or a systematic classification of coral types (19446), their dynamics (13824), or analysis of a specific species (19387). Some articles deal with the ecology of the coral reefs and their associated fish or invertebrate populations (19563, 19551, 19620). Some articles show the extent and status of corals region-wide (02402, AIMS survey, 15974) or for a specific country or area (13409, 19193, 19341, 19289) or the effects of macroalgae growth (19221) or temperature rises (19807, 19864). Several international networks are established to map and monitor reef health (see Appendix 5).

### ***Mangroves***

There are few papers related to the biology or ecology of mangrove communities in the Caribbean. Of those, there are descriptions of morphology (16796), change as detected from satellites (19886), and effects of salinity on mangrove stands (19872). One article looked at the ecology of the tidal flats of the Bahamas (14850). Presence and status of mangrove is covered by WCMC, which has a web site on mangroves.

### ***Fish & invertebrates***

There is a wealth of studies on individual fish and invertebrates dealing with biology, distribution, habitats or behaviour. For example, in fish there are studies of dwarf herring (19250), goat-fish (19413), flying fish (19717, 19766, 19788), damselfish (19824) and parrot fish (19832). Most invertebrate studies concentrate on Jamaican crabs (14496), lobsters or conch, and cover habitats (particularly the relationship with seagrass and mangrove), distributions, biology (especially recruitment), and aggregations of invertebrate populations (19334, 19532, 19782, 19806, 19750, 19836).

### ***Sedimentation***

While there are many references dealing with *in situ* sediments (13689, 15394, 16027, 16227, 16447, 18897, 18904), there are few on the process of sedimentation and its effects on mangroves, seagrass or coral *per se*.

### ***Biodiversity***

Overall biodiversity issues are covered (00190, 02692, 03296) as are specific issues related to reptiles, specifically turtles (19547 19882, 19203) and mammals (19522, 19534). There are also studies on the meaning and estimation of biodiversity, e.g. the study of coral biodiversity and whether the estimations are much lower than the actual quantity and range of flora and fauna (19450).

### ***Intrinsic Value / Scenic***

The value of landscape, as part of both intrinsic health of Caribbean populations and as a selling point to tourists, has not been widely studied in the academic press. A study on landscape as a resource for national development (3970) and another for managing island landscapes have been produced (15147). There are perceptual studies in Barbados (e.g. 03403) although this concluded that people take a more economic and social view of their local environments rather than a physical appreciation.

### ***Mineral Resource***

The number of papers on geology in the Caribbean is quite astonishing. These cover major structural features, volcanic and earthquake histories, paleoclimatic and paleogeological mappings and histories, mineral resource mapping and formation, sedimentology, vulcanology and geomorphological form and process, much of which is of minimal interest to this project. Some consider the potential of reserves (see Extracted Resource: Box 2 - below).

### ***Natural Risks***

Most of the papers covering natural risks either map the risk in some way (earthquake 14122, volcano 13803) or give techniques for evaluation (e.g. 14562), but tend to link to human activity in some way. Hence there is a wealth of articles covering the socio-economic impacts of natural hazards, mainly to do with the national aspects (03122) but occasionally looking at communities (12518, 12517).

### ***Geochemical potential***

Numerous articles look at geochemical potential throughout the Caribbean Region (for example, 16843).

## **Box 2: EXTRACTED RESOURCE**

References on resources extracted are more difficult to come by in many sectors, partly because they are 'commercial in confidence'. However, in certain areas, there is a lot of work on types of extracted resource that reach the public domain. A few articles discuss the relative stress on the environment, particularly the marine environmental (15905, 19145).

### ***Extracted resource - mineral mapping***

Mineral mapping references are abundant, many dealing with the extraction of oil, coal or gas (e.g. Venezuela 17575; St Lucia 18223). Others deal with precious and semi-precious stone (e.g. amber mining in Dominican Republic, 18734), of legal or illicit sand quarrying from beaches, a huge problem on some small islands (17661, 18896), or surveys or usage of other aggregate mining (19044, 17662, 17843, 14341).

### ***Fish stocks***

Cases studies and general principles exist for the evaluation of fish stocks (e.g. in coral reef; 19401; pelagics, 01281) and many reports on the fisheries industries have sizeable sections estimating the potential of fish in benthic and pelagic waters (01450, SVG fisheries report). Some studies focus on specific species such as swordfish in the USA (19901) or conch aggregations in seagrass beds (19752), but most consider habitat or country specific regions. Very few references look at the potential of aquaculture - 19422 is an exception.

### ***Marine Harvesting***

Marine harvesting defines the extraction of plant and algal life from the coastal region. Significant work has been done by the Caribbean Natural Resources Institute (CANARI) in St Lucia, of which the human impact is covered elsewhere in this report. Under the banner of extracted resource, there are works on sea-moss harvesting, particularly emphasising the women's role (00013) and seaweed harvesting (00038). An annotated bibliography of seaweed use for food in the West Indies exists (01542).

### ***Agriculture and land use***

References on agricultural resources focus on soil and land use. There is information on land use mapping techniques (13477), particularly the application of GIS or remote sensing techniques (16146), and some focus on the actual land use either for a country or for a particular area (14646, 15193, 15206, 15900, 15703). In published work, there are reports on the process of soil loss and erosion (14646, 15900, 15207) and techniques and applications for

its conservation (St Lucia, 16392; general 14248). Occasionally more peculiar references come to light to do with agriculture, such as the guano mining in Puerto Rico (17790). Water use in agriculture is also covered (18942, 16543). There are also linkages with strategies to ameliorate land based sources of pollution in the marine environment (19503). Less often than expected, there are case studies on particular agricultural industries in specific locations (for example, the arrowroot cropping in St Vincent, 03273).

### ***Built environment***

There are a large number of references dealing with the urban fabric and socio-economic zoning in the cities of the Caribbean. There have been studies regarding the overall spatial structure (03701) or the housing market (in terms of architecture, land tenure and self help schemes) in Barbados (04407) and Montserrat (01365). The threats to urban areas has been covered (inundation maps 16128; control of erosion 15136) and the impacts of urban areas on other environments by its waste products (13798) particularly on fluvial and marine environments (14637). Threats as a result of expansion (02878) especially by the endemic suburban sprawl seen in many countries are also discussed (e.g. Antigua, 04440).

Within the structure of the city, it has been shown how physical planning and redevelopment (directed mainly at the tourism trade) has impinged on the opportunities of the urban poor (03745). Of key interest is the "gentrification" process which has started near cruise ship docks and in city centres to attract and retain large cruise ship contracts (e.g. St John, Antigua 04375). Although quite closely linked with the human resource impact, the process of urbanisation and its consequent rural displacement has been studied in the Eastern Caribbean (04020) and there have been attempts to halt such a process through agrarian policies (11921).

### ***Ports and navigation***

Very little has been written on the physical structures needed for ports and navigation in the databases searched, although it is to be expected that engineering journals would highlight many of the areas of interest. Two interesting articles were found, one giving best practice on mangrove management on the design and upkeep of coastal marinas (02013) as a useful method of protecting craft during the hurricane season and beyond, and the other describing the process of infilling an open seaway with sediment (14013).

### ***EEZ definition***

A major national concern is the definition of the Economic Zone for countries in the Caribbean. Statistics exist for this and the Global Maritime Boundaries Database maps of the boundaries (characterised by those which are by multilateral agreement, unilateral definition and disputed) are at [www.MaritimeBoundaries.com](http://www.MaritimeBoundaries.com). However, no other references to EEZs were found during the search.

### ***Carrying capacities (e.g. for tourism or fishing).***

The usage of the phrase 'carrying capacity' is limited in the references found, but is more recently gathering momentum. Two major records are a reference on the definition of a carrying capacity for tourism (03488) and the coral reef resources of Mexico (19353).

### ***Water resource management***

As with other resources, information exists on actual resources of country specific (Bahamas, 15639; Jamaica, 18925) city specific (Greater Kingston, 18941) and more generic (18512). Occasionally there are records of the effect of structures for water supplies on the surrounding environment (e.g. the effect of dams on coastal water intakes and fauna, 19773).

### **Box 3: ACTIVITY**

A wealth of studies exists regarding the many activities practised in the Caribbean, mainly due to the sectoral research and administration of national governments and multinational organisations. In terms of the multiple strategies though, only one reference specifically mention multiple occupations, looking at women, work and their lifestyles in the rural Caribbean (04319).

#### ***Fisheries sector***

Some references in the fishing industry look at the practice itself (e.g. Jamaican artisanal fisheries, 02396, 02760) but more common is an overview of the entire sector at different periods: (00052 - trawl fishery in Trinidad and Tobago, 01450 - Montserrat status of fisheries, 01460 - Antigua and other OECS; 01461 - Grenada and other OECS states; 10451- Grenada). Many of these reports, including several records from the 1970s, are for planning purposes (Barbados, 02112).

These studies tend to look across the sector, and are bound to show a few pointers towards the opportunities and constraints existing for the artisanal or business fisher. A good example of this is a report (Ryan, 1999) detailing the status of the fisheries sector in St Vincent and the Grenadines, and is typical of the country reports produced throughout the nine member states of the OECS. It contains a large section on the human profile, as well as the fisheries resources, technical considerations (vessels, gear, ownership etc), marketing and management. His conclusions include the short termism view that fishermen have no real concept of saving for new equipment, or for producing any kind of flexibility in the fleet. Fisheries in St Vincent tend to be run by individuals or small family groupings. Because of the nature of the boat and the inflexibility of large gear ships, there are a lot of short day trip fishers reaping the benthic layers, but not exploiting the larger pelagic and deep slope demersal fisheries stocks in the EEZ. Changes in the business attitude of fishermen are seen as essential. Ryan also noted the gender and age split in fishermen. Very few women have any part in the fisheries sector, and entry of youth into the industry is too low to sustain the effort of fishing. Better information on the productive areas around St Vincent and the Grenadines is required.

Some studies have tried to evaluate the success of previous particular projects (e.g. Antigua Barbuda, 01395). It is believed that there are a large number of reports detailing national fisheries and the impacts of policies that are hidden in grey literature in individual countries. However, it is only recently that studies have turned to more than purely the economic impact of the fisherfolk. Now there is a plethora of studies looking at the impact of a particularly fishery (e.g. the lobster fishery of Barbuda, 00005; fin fish fishery in Belize and Jamaica, 02481), or of fisheries in general on a certain aspect of demography (01232 - role of women in fisheries in Antigua/Barbuda). A bibliography of results can be obtained from University of West Indies, Mona Campus (02727). Some studies focus particularly on community aspects e.g. the making of a West Indian fishing community looks at the transformation of farmers on Bequia into fishermen (04617).

Case studies evaluating the status of coastal communities have been conducted on small areas within the Caribbean region. Espeut (2000) has completed a socio-economic baseline census of households in the fishing community of Old Harbour Bay, St Catherine, Jamaica. In a questionnaire survey designed to determine the demography, education levels, occupational structure and activities in the region, Espeut determined that the communities in the Portland Bight region should have a vested interest in the declining health of the fish stock, but that declining fish stock and increased effort in fishing may ultimately reduce the number of fishermen and give the stock a breathing space to recover. However, he acknowledges that although at present multi-occupancy is not high in fishing communities, the knock-on effect of higher catch and effort is not well understood.

In some cases new suggestions for management practices to artisanal fisheries are being proposed (02760, 19304 in the use of gill nets and their impact on cetaceans), and some particularly look at the impact of national strategies on artisanal fisherfolk (11406). Work has been done on the effect of fisheries on general marine biodiversity (03302, 03303) and specifically overfishing (19633, 02581). Finally, specific minority fisheries have been studied sporadically (whaling, 09748; shark fishing in the USA, 19426).

### ***Mariculture/Aquaculture***

A small number of articles have looked at mariculture and aquaculture. Sea-moss mariculture is discussed in 00914, and the effects of cultivation of sea-moss and Irish moss have been studied (02482). Both sectors are very small. Aquaculture/mariculture of fish and invertebrates is only really seen as productive on the mainland. However, feasibility studies in some islands exist (e.g. feasibility of Florida red tilapia in Haiti; 04406, and king crab mariculture (11838) have been investigated).

### ***Agricultural sector.***

The legacy of the plantation culture, both on the owners and the workers, still impacts on the economic and cultural life of the Caribbean. A series of historical references is available covering specific industries, and attempts to diversify island economics from monoculture are covered (e.g. St Lucia, 11876, 12124; St Kitts 01466, 01261). Some more recent studies look at the inertia from plantation culture as endemic in the rural livelihoods (e.g. 11861- persistent peasantry in plantation culture).

As in many sectors, many organisations and national governments produce reports highlighting the worth of agriculture to the economy, and these can be found in the literature. For example, the OECS library has enormous numbers of references dealing with this from as early as the 1960s. Far fewer studies look at the activities of individual farmers and their own socio-economic status. However, the number of references over the last few years has steadily increased each year.

Of the issues covering the agricultural sector, of most interest are those dealing with the impacts of a particular sector on social and economic structures, and vice versa, for example the study of livestock management in Carriacou in Grenada (01079). Similarly there are now several analyses examining the work of the small farmer (04459, 04477, 11835, 10486 St Vincent and other OECS states, 11835, St Vincent 01291, 01145 St Lucia and elsewhere), their relationship with land tenure (01291) and their impact on their watersheds (02042) and environment (16227). Some look specifically at the division of labour and gender inequalities (03889, 04454).

These references are never specifically to do with coastal communities and it is very difficult to draw the dividing line between coastal agriculture and any other sort. No references seem to look at the division of work time between fishing and agriculture or agriculture and tourism.

### ***Forestry industry***

Far fewer references exist discussing the forestry industry in the Caribbean islands than for agriculture, although more detailed references concerning the continental Caribbean countries may have been missed. As with agriculture it is very difficult to look directly at the impact of the forestry industry on coastal livelihoods. National forestry plans and reports exist (e.g. 1015 for St Kitts and Nevis), as do some reports on agroforestry and its benefits and costs (03426, 03370). A small number of references were found covering participatory and community forestry projects (e.g. Jamaica 0223; Dominica, 02656) and one paper looked at political influence of forest communities in Costa Rica (11279). Again the importance for coastal livelihoods is not evident and these references are considered peripheral.

### ***Quarrying industry***

While there are many references looking at the potential and the extraction of minerals, articles dealing with quarrying activity *per se* are few and far between. Examples include some looking at the bauxite industry of Jamaica (16524, 18757), and how to deal with the limited aggregates available on some of the smaller islands (Trinidad 17644). This latter reference is of particular interest as the beach and coastal zone is seen as a potential resource. The issues of both legal and illegal extraction of sand and other aggregate from the beach are widely discussed, and results from conferences are available (00976, 00231, 03123). The impacts of these activities are also being regarded by a few studies, either generally (19079) or more specifically in a reclamation process of old mined-out areas (13496).

### ***Tourism industry***

By far the largest number of references to do with a particular sector comes from the tourism industry. As well as basic statistics on various aspects of the industry (cruise ship entries, number of visitors, number of hotel beds, GNP contribution etc.), many detailed aspects of tourism are covered. First, there are general papers on the development, structure and impact of tourism in the Caribbean Islands (03600), the best of which is Pantin (3832) on sustainable tourism. Pantin (3832) attempts to identify indicators of the level of sustainability in terms of economic, social-cultural and ecological policy. Country specific studies exist in the published literature (as a development tool in Belize, 04285, or more generally in Cuba, 03772) but it is to be expected that a wealth of information is hidden in national grey literature.

The relative tensions of having a tourist industry on a small island have often been explored (03753), described as a fragile dependence (11616) or a last resort "cost" (11119). Certain sectors of the industry have been studied, in relation to expanding cruise ship development (04445), or of the development of small accommodation units as opposed to the large-scale resorts (03972). Indeed there has been considerable exploration of the issues of locally established tourism facilities and the extent to which they are excluded from the national strategies or large company packaged tours (03845). There have been limited studies of the establishment and utilisation of craftwork as a diversifying element of the tourist industry (01331, 19469).

Some specific franchises are investigated in the literature (scuba diving economic management (19794, 03356), marine recreational fisheries (USA mainland, 19638; Puerto Rico, 11407)). Another reference looks more generally at the provision of a flexible approach to specialisation in tourist activity (03777).

Studies on the marketing of small tourist franchises are often lacking. Although one paper exists on marketing marine protected areas (00006), no similar study has been made into the marketing of activities such as glass bottom boats, bed and breakfast, restaurants, local guides or walks, and the opportunities and constraints of such.

Waste generation and ecological impact of tourist visitors to ecological sites is seen as important in environmental terms (03828). Several studies have concentrated on the environmental impact of tourism (19322, 19244, 19151, 19352) but fewer have looked at the sociological or livelihood impact.

Recently there has been an upsurge in eco-tourism references, seen as a conduit for travel money in countries without the 'sun, sea and sand' image, or those that have not already been exploited either environmentally or economically. Several countries are exploring the potential (e.g. Dominica, Haiti) and references of these case studies abound (03744, 03736, 03956, 03735, 03367, 01732). Some of these show the role of the local community in its management (03037, 01167) and there are some references on how the role of an ecologist can assist in tourism (e.g. in Mustique; 13478).

Beach and eco-tourism dominate the Caribbean tourist industry, and the references reflect this, but some scope for heritage tourism has become well developed in a few countries (e.g. Barbados) and others are looking into strategies issues (e.g. in St Vincent, Lampkin *pers. comm.*). In some areas, the expansion of heritage tourism as a conduit for rural development is being sought (00020).

A summary of geographical research into tourism has been created for Latin America for 1980-1990 (03754).

### ***Industry***

Industry is not well covered in the databases reviewed, and only a small number of references to do with specific industries were noted (e.g. the use of sand for the Puerto Rican glass industry, 01836). Some work on the fuel industry exists (e.g. the oil industry in Barbados (17629), but few are directly relevant to coastal poor (an exception being 01836 - fuelwood consumption in Jamaica).

### ***Inappropriate/appropriate technologies***

The impacts of certain sectoral activities on environment or other activities have been highlighted above, but some more general articles exist, often looking at the impacts of degradation (03361) or more general statements of development and resource depletion (04472). Occasionally a case study has been comprehensive (e.g. the mismanagement of Hellshire Beach in Jamaica, 03157). Some articles detail appropriate (e.g. intermediate) technologies for fishermen (023479) or farmers responding to environmental problems (e.g. soil loss 03392).

## **Box 4: HUMAN RESOURCE**

### ***Demography***

Probably due to the ready availability of statistics, there are numerous demographic studies available (e.g. Montserrat and other OECS studies, 01071). The items highlighted here are trying to be more focused on the coastal poor. There are often useful data from the household surveys conducted (e.g. for Grenada and other OECS states - 01108).

The changing roles of gender are now being studied (04498, 12755), particularly from the realisation that both male (04190) and female roles are changing (e.g. Dis ah hard wuk - 01322). Occasionally, studies focus in on particular age groups (11357, 11880) or discuss ageing as an issue (12082). Many articles on racism also exist. Most of these are based on Caribbean communities in North America or Europe, but a few consider racism within the Caribbean region (e.g. 04184). A specific case looking at small island progress through the demographic transition is given in 12780.

### ***Capital assets***

Publications related to capital assets mainly consider housing or kitchen gardens. However, there are many articles about commercial and industrial assets in the sectoral reports (see previous Section: Box 3 - Activities). The importance of the kitchen garden has recently been acknowledged in providing households with important nutrition (03986), even to the extent of having a social role (03914). Housing studies exist (03962, 11493) and concentrate on low income surveys (as far back as 1972 - 01481), resettlement schemes (01087), action oriented housing (01255), shelter loans (01264) and schemes for redevelopment (01282). There has been some criticism that these schemes can often exclude the very people they are trying to help (11116).



### ***Security***

It is interesting to note that the only reference to security in the database refers to military and national economic security (04263). Only one study looks at personal security from any dimension, that of unemployment within the Caribbean (11259).

### ***Financial - incomes, saving and credit***

In terms of financial insurance, there are several articles available looking at a range of incentives and policies to help agricultural development (01190) or fisheries (01794). Even here, many articles look more at a national than local scale (e.g. 04668 looks at foreign aid and domestic savings, but generally considers economic growth on a national scale). A comparative study in Latin America does look at poverty and income distribution (03716) but no complementary study could be found for the Caribbean.

### ***Personal Education***

Restricting the debate to personal education in this section, very few studies were found. However, there are a few references that deal with the issue of environmental education, which can fit loosely into this category (01740, 03372, 19298).

### ***Health and nutrition***

Few studies look at health from an individual standpoint, though there are numerous overviews of healthcare in the region (03517, 12684, 15906) or are country specific (e.g. Dominica - 04010). One looks in particular at socio-economic determinants of health status (11427) while another bemoans the fact that there are too few studies on environment, health and gender (04168). A few articles look at the financing of health systems (01047, 12234).

### ***Employment***

Some work on labour markets revolves around the complexity of migration and residency in some islands with small labour pools (e.g. British Virgin Islands, 01204) or in the appearance of flexible labour markets (11408) and reform (04703). There are several references dealing with unemployment (see also security), from a statistical point of view (01238) or from case studies (e.g. a Nicaraguan's history of his search for work on the Atlantic coast, 11469). With the seasonal nature of much of the agricultural work, particularly on plantations, it is not surprising that references deal with what to do in the intervening time; e.g. how to make a living during non-active periods in a sugar producing region (13336).

## **BOX 5: SOCIAL CAPITAL**

### ***Poverty and human development Indices***

The use of poverty and human development indices is a useful measure to compare problems between countries or regions. It suffers partly from the aggregated nature and the selection of the parameters used, and also on the scale at which the data are collected. Unfortunately, many of the indicators used in this study are at a national level, so it is difficult to tie down the real situation on the coast. Only on large islands is it possible to have data at district level where some discrimination between coastal and inland districts can be discerned.

However, apart from the UNDP Human Development Index some people have suggested frameworks for measuring social, economic and political indicators of change in the Caribbean (11592) or have tried to determine the levels of living (11579) or the quality of life (11569). A few references look directly at poverty and inequality (e.g. in Latin America (03678) or in a specific country (e.g. Trinidad, 04102). Finally, an index of tourist penetration has been created for small Caribbean islands (03846).

### ***Education***

It was noted earlier that there were few articles on personal education levels. In the published literature there seems to be very little on formal education also. Only two examples of any note were picked out, and it is difficult to know if these are representative (03908 on adult education, and 12502 on education in Latin America and the Caribbean), and have nothing more than generic importance to the coastal zone.

### ***Co-management (empowerment).***

Many references deal with the issue of co-management, particularly of the environment. Examples include the management of mangroves (00024) coral reefs (01872, 03436) fisheries (19423) or general coastal management (19336). There are even general guides to co-management (19335) and on governance of MPAs (19317). However, co-management is not without its constraints, and many co-management measures are in crisis because of a lack of human or financial resources (00023).

### ***Community***

Following from co-management *per se*, many articles look at community involvement in the management of resources. These range from simple participation in environment (00034, 02144) or housing (12446), to community organisation (00015) to full management of resources (00037). There are several lessons to learn from these projects (01617, 02355) as a potential way to educate local populations and relieve environmental stress, but these proposals are not without their critics. Both during the preliminary visit and at the end of project workshop (Barbados 14-15 June 2001) many people said the quality of references on co-management and community management were poor or superficial.

There are relatively few coherent references considering the concept of community. Case studies exist on different communities, e.g. in fisheries (Coopers Town, Bahamas, 11390; Sta Marta, Colombia, 04958; Grenadines, 01536) and Carib communities (St Vincent, 00870). There are also several studies on urban communities. Some work has been published on the social and perceptual impacts of changing communities within the urban fabric of Caribbean cities (03935, 03947, 04127). One study looks in particular at Cartagena (11341), while another considers the relationship between rural and urban communities in the eastern Caribbean, from both a functional and sociological perspective (04202).

### ***Culture***

Tourist brochures and coffee table travelogues show how the Caribbean is a rich tapestry of cultures, few of which are indigenous. Particularly in tourism (see above), cultural and historical sites are viewed as money earners, but both physical embodiments of cultural heritage, and the oral, written and sung traditions are increasingly seen as a part of a healthy social diversity. Few studies were found in this area, but the major bibliographies and the search terms used may not highlight all the relevant references. Some work on cultural expression was found (e.g. Trinidad 03218, 04310) and also examples of how historical buildings are being preserved (15655).

### **Box 6: FORMAL SOCIAL CAPITAL**

The emphasis of this project is on the individual and informal or local groupings, but it is obvious, both from the literature and the personal experiences of people in the region, that the formal institutions at local, national and regional level fundamentally influence the life choices of the individual. A general paper (04189) covers the process of building social capital.

### ***Coastal zone management schemes***

A wealth of articles looks at CZM schemes. They can be split into the theory of coastal zone management and 'best practice' manuals of the whole scheme (01616, 01675, 02088, 02175) or parts of it (e.g. information management, 04976, 00205). There are also examinations of individual reserves (Saba, 00014; Guadeloupe, 00019; Portland Bight, Jamaica, 00046; Jamaica South Coast Sustainable Development Plan, 01648; Buccoo Reef, Tobago, 00326; Belize, 00351; Soufriere, St Lucia, 02565) and country-wide overviews (St Kitts and Nevis, 01136, 01163; Costa Rica, 18324; Trinidad and Tobago, 00442). Some look at the conservation of major features or specific flora or fauna (e.g. mangrove, 02088; fisheries in Montserrat and other CARICOM countries, 01972), or the protection of a specific resource (e.g. sand mining regulation in BVI, 01143; coral beaches, 06152; beach stability, 15200). More generally it is the geographical region that is important rather than the resource.

Many deal with the plan to set up new coastal zone management schemes (Belize, 01860; Portland Bight, 0046) or a whole strategy for a region, such as the IDB's approach for coastal and marine resources management in Latin America and the Caribbean (19907; ICZM 19319). Other references are evaluating the success of such a scheme (e.g. Soufriere, St Lucia, 02319, 02565; Costa Rica, 19324; UNESCO sites in Dominica, St Kitts and Nevis, 00895). There are those which suggest that there are key conflicts which cannot be resolved (e.g. between marine biodiversity and fisheries, 03852), although Soufriere Marine Management Area in St Lucia would argue that marine reserves are for fishermen (Roberts, 1998) and others have attempted conflict resolution (02662). Others have tried to integrate the needs of fishermen in their studies (CANARI, 00025)

Some economic and social aspects have been investigated (00014, 00019, 02376, 00026) but it is hard to ascertain to what level full analyses have taken place. The relative success of schemes is piecemeal across the region, and attempts to spread the good practice across the region are beset by problems (19402). In principle the management of wider marine resources should be seen as a binding process (04328), but parochialism and scarcity of natural resources continue to be a problem. Despite this, properly managed schemes are seen as a catalyst for development (19321) and can integrate the local community into action (01163).

The vast majority of these papers deal purely with the management of such schemes, and only rarely are there studies of the social or economic impact on a community or the individual.

Outside the published or catalogued literature it is expected that individual organisations probably have many reports and pamphlets dealing with a similar range of issues related to CZM schemes.

### ***Co-management***

Public participation in the decision making process has become a popular issue in more recent references. This ranges from participation in coastal zone issues (00022, 02083, 00036) or fisheries management (02471, 01674) to more general natural resource management (0009, 00018, 00021), which can be of great use in strategic long term planning (03854). Apart from communities themselves, NGOs are strong participants in local management of natural resources (00035).

Many projects focus on particular areas of coastal management (such as mangroves, 00041, 02513, 19520; sea urchins, 19326, 01045; marine turtles, 00027) or on a specific activity (e.g. moorings in BVI, 00010). Other community participation investigates self-help (4553, 12982) and some studies have looked at women's role in establishing and sustaining rural projects (e.g. in SVG, 11881).

### ***Stakeholders and conflicts***

In terms of stakeholders, data entry 01615 tries to detail the relevant partners. Obviously, since stakeholders share the same geographical space, they have access to similar capital, and conflict resolution is a method for partitioning these resources equitably. Manuals exist for techniques (00935, 01699) but few references look at the success of conflict resolution.

### ***Legal aspects***

A range of laws deal with the legal aspects of coastal protection and management and their effects on the livelihoods of the poor. The Trinidad Institute for Marine Affairs (IMA) has summarised (00087) and compared (00144) the laws in the coastal environment and the sea (00147), and regional organisations are producing conventions (UNEP draft convention, 15830; OECS St George's Declaration) which impinge on sustainable development in the coastal zone. Only one study found tried to look at the issue of regulations and enforcement, a case study in Honduras which argues that coastal zone management projects fail because there are too many regulations and not enough resources or good will to enforce them (19398). Ryan (1999) in SVG concurs with this view. A few other articles look at law enforcement issues (19336, 11774).

### ***Macro laws and economics***

Reports on macro-economics abound, but few deal with the relationship between government, international economic flows and the poor, let alone the coastal poor. Articles look at the relationship between the economy and the environment (00533, 00988) especially environmentally sustainable economic development (01738). Some studies have looked at the impact of policies on the coastal zone in industry (01993) and in urban areas (01888), or have linkages between different sectors (e.g. tourism and domestic industry, 01399).

Politics is an important issue in many countries. The fragmentation of different states is often argued to be detrimental to the development of the region (04616); indeed the multitude of different systems over the years has contributed to that fragmentation (01081, 04062). Some countries are so small they have difficulties withstanding the shocks of the world economy (04222, 04446). Furthermore, it is not only economic threats can disable a country, but taken with natural hazards, which have their own economics (02196), small states are increasingly vulnerable (01081, 04129), with the poor of these nations being the most vulnerable of all. Although several states have a high GDP and are major players in international money markets (e.g. The Cayman Islands, 04256) with a high level of entrepreneurship (12353) there are communities of poor people even within "rich" islands. This information is rarely discernable from aggregated statistics or covered separately in references (12021).

Some studies (e.g. a case study on growth, inequality and poverty in Guyana (11424)) have tried to analyse relationships between macro-economics and livelihoods of local poor people in the Caribbean. Public social spending as a safety net has been studied (03711, 04575), but bilateral or multilateral loans are not necessarily the best way to solve the economic problems of the region (11324), as it is giving with one hand and taking with another. Geographical trends in spending have been looked at (04307). The role of the welfare state has been discussed for both the Caribbean (01214) and Latin America (04364), and a series of studies looks specifically at poverty issues (00757, 03677, 03699, 03712) although, as before, the coastal poor are rarely distinguishable within national aggregates. In some instances the welfare state does not exist, but only one example of the informal social safety net was discovered ('welfare in the absence of a welfare state', 11214).

### ***Vulnerability of population sectors – which sectors; what alternatives?***

'Vulnerability' is a complex word to deal with, and many broadly related references can be found in terms of economics, natural resources, natural hazards. Here the references cover insecurity and homelessness. There is a small number of references looking at cultural issues in homelessness (e.g. in Puerto Rico, 11805), and how squatters have been brought back into

the public system (11105) through integrated rural development programmes. The urban informal sector has been studied (12762) as has ethnicity in the Spanish Caribbean and how job opportunities can be determined by it (12517).

## **SECTION 5B: CROSS CUTTING ISSUES**

A number of important issues do not fit easily within the 6-box framework established in Figures 3.1 and 3.2 (Section 3), but either link two boxes together or are a continuous theme throughout the diagram. These are dealt with below.

### ***Tourism vs fisheries conflicts***

The recurring theme where these conflicts between industrial sectors exist is between tourism and others. Obviously, there is a potential (or realised) problem between tourism and the environment (00438, 03484, 00439; St Kitts, 01133; Honduras, 04277; Tobago, 00337). The effects on particular species (e.g. invertebrates, 03458; fisheries, 028700 and on agriculture, 01245) have occasionally been considered.

Seasonal and spatial concentrations of tourists put a strain on all resources, whether natural or human. Stress on food production is one angle, not only in terms of quantities needed but also on the quality of such (12175, 03806). Nothing appears to be written on the effect this has on the local market. Some countries have become over-developed in tourist terms, catering to mass markets and seriously degrading the environment (3832). Other case studies corroborate this theory (e.g. 00907, 04225 in Antigua). Direct social conflict between tourists and residents has only rarely been studied (e.g. the residents' attitudes to an "Instant Resort Enclave", 11617).

### ***Migration (long term commuting) & remittances .***

A massive amount has been written on migration in the Caribbean - probably because statistics are readily available. How much of it is relevant to the coastal poor is difficult to assess. There are a few studies on commuters (e.g. 03511 looks at how low income migrants choose living locations in Port of Spain, Trinidad in a stepwise progression) and intra-urban migration (03521). More frequently, rural-urban migration has been studied as part of the development (04618, 11321) or urbanisation process (03520).

By far the majority of references deal with either intra-regional migration (11934 to Puerto Rico) or out of the region, mainly to the North American states (12363) or to former colonial powers (12346, 04216, 04185, 04172, 04104, 03900). Some articles look at the effect on the island of emigration (Bahamas, BVI, Sint Maarten, USVI, 00725; Barbados, 04099, 04172, 12532). There are general texts on understanding the effects of migration (04598, 12772), the social and economic factors affecting emigration (11207) and the effects of these on an island's demographic transition (11225). In some cases it can be shown how mass migration has seriously affected island development by removing part of the working population (1146) and can change an island permanently (03509). Only one study looks at the effect of immigration (to The Cayman Islands - 04259), but some look at returning emigrants (e.g. Guyana, 11425).

The method, pattern and effect of remittances on local populations have been widely studied, but seems to affect only certain countries significantly (12724, 12899, 13339, 11430, 11323). UWI Mona Campus have created a bibliography of migration (12305).

### ***Smuggling***

To some in the region, smuggling is a massive issue, a major money source and an informal economy, with important impacts on local communities, both economically and socially. It is surprising perhaps that there are few references on the subject, but data collection, verification (and the security of the researchers) preclude easy study! Only one study looks at the social effects of smuggling (12393).

Some very general studies exist on money laundering (03575) and drugs (03910, 04298, 04332, 11275) but nothing on the smuggling of other commodities such as white goods. Studies on other crime have been done (11261, 11647, 12914), and a common theme is that the perception of the Caribbean as a paradise can be crudely destroyed by an analysis of crime patterns (e.g. 13376).

### ***Large island/small island relationships***

A major perception is that some islands have been grouped together as countries for matters of colonial convenience are not as friendly to each other as might be expected. Despite much anecdotal evidence, and a few historical incidences (e.g. 'the revolution that never was' in Anguilla), only one reference draws attention to the fact when discussing Tobago's quest for autonomy (04051).

### ***Natural disasters***

This is another theme that has been well studied from a diversity of angles. There are both global scale studies and others on the impacts on the Caribbean (03773, 19152), for example on coral reefs (0845), their bleaching (19403), on wetlands and lowlands (19661) and on mangroves (19313). A massive bibliography exists on paleoclimatic records and how they may point to long term present day changes (e.g. historical sea level rise 15113). Some work on earthquakes exists (15142) and on volcanoes (15678, 14689; Montserrat, 15141). One study looks at the potential of a violent eruption of 'Kick 'em Jenny', a submarine volcano off Grenada, to cause a massive tsunami (14129) but generally tidal waves are not a major concern in the Caribbean.

Hurricanes are the largest perceived threat in the region, and many studies look at this issue. For example, Hurricane Hugo (1989) has been investigated from various angles (sand deposit effects, 14796; agriculture, 01065; damage, 01294, 01295), and other studies compare damage on coral (14798) and on beaches. (A database of hurricane literature can be found in reference 15308).

Methods for mapping and monitoring these natural hazards exist (15143, 14267), but very few of the studies look at the direct effect on individuals or the poor. 02481 looks at natural disasters and the small farmer; and human factors in coping with coastal zone erosion are considered in 19316. There seems to be a large gap, once more, in understanding the effects of these major disasters on the most vulnerable portions of the population.

### ***Reclamation***

Despite reclamation being a widespread activity in the urban areas of many islands, there are relatively few references examining it, only a couple dealing with restoration of coral reef (13797) and mangrove (19318).

### ***Waste management***

A small number of articles look at transboundary movement of hazardous waste (19320) or marine debris on coast (19731), but few look at local treatment or management of waste or its affects on nearby populations (1697; Thomas-Hope, 1998),

### ***Co-Management***

Like with many other studies, the reports on co-management efforts are piecemeal. OECS have produced a management plan for Buccament Valley in St Vincent and the Grenadines (1999) funded by GTZ. Although this focuses predominantly on the watershed, there are many implications for the coastal zone. NRMU promotes the concept of total Island Systems Management - whereby all activities on the land have an impact on the coast (1661). Portland

Bight Co-Management Plan (1999) lays out a strategy for how the management of co-management scheme can be laid out. While it is realised that co-management can have a key role in allowing two-way development and integrates civil society into the decision making process, there is some speculation that projects can have a co-management tag without true community involvement.

#### ***Community management based on a single resource***

Many of the references available concentrate on one small environment. For example a study conducted by the (00005) concentrated on the lobster fishery of Barbuda. A long term project on St Lucia highlights the way the community can be persuaded to change their practices to conserve a key resource not only for themselves, but as a vital national and global resource. One study has measured the off-take of charcoal in relation to mangrove health (00041), while (00024) demonstrated how co-management of the mangrove swamp has shown that it can be used as a model for mangrove management. Some of the major weaknesses that have been identified have been the organisational weakness of the local producer groups. (It should be noted, in parallel, that experiences by the authors in Tobago showed a similar problem. The All Tobago Fisherfolk Association, despite good drive and sensible organisation, suffered from a lack of ground level enthusiasm (in that representatives from some parts of the island were never present at meetings) and a lack of resources to achieve their basic aims).

Many of the co-management options that have been created require there to be a better understanding of the basic biological processes and environmental interactions in the local community. The research needed and the dissemination of such research is seen as a major limitation for local communities to become effective managers of their own environments (00041).

#### ***Sustainable development***

Sustainability of activities is a large issue, yet sustainability of livelihoods is rarely mentioned. There are general overviews (03355) questioning whether this is attainable or a Utopia (01735) looking at issues in small islands, (03731, 03859, 01735, 01217). Other references examine sustainability in terms of particular sectors (agriculture, 01297; tourism, 01262, 3832; fishing 02074) or sustainability where there is multiple use - most prominently conservation of marine biodiversity, tourism and sustainable fisheries (03297, 03300).

#### ***Short termism against long termism***

It is recognised by many of the Virtual Steering Group that decisions taken on an individual, household, community, national or regional level, can often be short term and respond to the need for hand to mouth existence or simply to gain advantages over competitors. In many spheres of influence, there is recognition that this is doing long-term damage to the environment, and in some sectors that this damage affects individual livelihood choices. In many instances, however, short-term gain outweighs long term planning. One project aiming to realign this thinking is the Caribbean Planning for Adaptation to Global Climate Change (CPACC) project (003341). While there is a series of interventions at the national scale, and development of regional fora, there is little identification of risks of climate change to individuals, rather than to a nation or economic sector. Risk from inundation, hurricane or earthquake damage is a key problem for vulnerable poor people, who are less likely to be insured or capable of re-establishing themselves after such disasters.

#### ***Large scale vs. local scale operators.***

With the loss of preferential treatment for primary commodity exports in many Caribbean islands, tourism is seen as the major new economic earner for the majority of islands. Islands can be characterised in terms of their tourism maturity (3832). Islands such as Barbados and Bermuda are at the mature stage, characterised by high density, mass market, large scale tourism. Others are in an intermediate stage (e.g. British Virgin Islands, St Lucia, Anguilla,



Grenada) characterised by rapid growth and seasonality, and with activity holidays dominating. At the less tourist-developed destinations, e.g. St Vincent and Dominica, low density and often long stay visitors are common, with small hotels often concentrating of nature tourism and maintaining local control.

This useful characterisation of tourism helps to identify where and how local communities are able to contribute to this growth, and also where potential and real conflicts are occurring. In several countries, the nature of the market has already stopped local communities developing residential facilities, although in some islands (e.g. Barbados) there is much scope for day visitors to participate in attractions or activities. In other islands (e.g. Tobago) there has been some conflict between local tourism operators and the large hotels, where small scale operators are precluded from leaving marketing material in the hotels. With many holidays being arranged by remote package deals, local operators, unless involved with signed agreements with hotels, are not able to tap into this resource. Selling facilities through the Internet may be one method in the future whereby these package deal gatekeepers of tourists can be avoided.

In several countries, there is a "common right" to beach access for all residents (3832). Indeed the rather archaic Three Chains Act (Trinidad and Tobago, 1865) has recently been invoked to challenge a hotel's control over beach access in Tobago. The act was originally set up to allow British colonialist access to build battlements in times of conflict, but by this token, precludes permanent development within three chains (c.60 m) of the high water mark.

***The roles and responses of regional organisations to the issue of individual centred, poverty focused development aid.***

Regional organisations' responses to the role of the coastal poor in the sustainable development of coastal resources vary dramatically, and are rapidly changing. While the Department for International Development has been focused on poverty since its naming in 1997, the Inter-American Development Bank (1998) identifies the need to improve the life of communities dependent on coastal resources, and indeed fosters public participation in that process. However, it still has a top down approach where local communities are seen as the customer rather than a full partner in the development of the coast. Of the six major issues identified by the IDB, five contain ecological components, two are economic, and only one directly looks at the impoverishment of coastal communities. There is a realisation of a two-track approach to integrate linkages between top-down and bottom-up approaches to management.

UNESCO has a Small Islands Systems and their publication, Island Agenda (1994) has promoted the sustainable development of small islands through education, culture and communication. Their Wise Practices Forum, established in 1999 has looked for "Actions, processes, principles or decisions that contribute significantly to the achievement of environmentally sustainable, socially equitable, culturally appropriate, and economically-sound development in coastal areas."

USAID, with their Caribbean Regional Program (CRP) has an environmental strategy that has a priority concern for sustainable livelihoods (USAID, 2000).

Several institutions were involved in the Global Conference on Sustainable Development of Small Island Developing States Conference in Barbados in 1994. While the proposed interventions that were recommended were targeted towards ecological efforts, at the basis of the declaration was that "Sustainable development programmes must seek to enhance the quality of life of peoples, including their health, well being and safety". It does not explicitly aim to remove poverty from these people, or necessarily offer alternative livelihoods. This theme runs through several agendas, and there seems to be a direct conflict between the ability to produce a sustainable and healthy environment in which to live, and give all people,

and particularly the poor, the range of opportunities that they can make choices about their livelihood and lifestyle. Can this ever be resolved?

Based on the SIDS conference (1994), the nine member states of the Organisation of Eastern Caribbean States have resolved to sign up to the Eastern Caribbean St George's Declaration of Principles for Environmental Sustainability in the OECS (OECS/NRMU & Member States, 2000), which as Principle 1 declares, "Each contracting state should develop and promote programmes to address poverty, health, employment, education, social development and provision of basic human needs to improve the quality of life within the carrying capacity of its natural resources." But it goes further in Principle 4 when it declares it wants to "Ensure meaningful participation by Civil Society in Decision Making".

**Table 5.1 Summary of review from literature, with potential researchable gaps identified.**

Main topic	Number of references	Detailed topics	Potential researchable gaps
Large island/ small island Relationships	60	Migration Economic vulnerability Education, women Political fragmentation Marine Space	
Short term responses to long term issues	??	Difficult to define in database search Natural Resource or Sectoral strategic planning	Individual economic planning
Migration and remittances	340	Demographic instability Circulation and return Ethnicity and diversity	Effects on remaining population
Land & sea pollution	250	Causes and effects on natural environment, occ. Health	Limitations on livelihoods opportunities
smuggling	1	Prison experiences	Effect on community, social fabric and economy
Enforcement	30	Environmental legislation Parks development Protection of Species	Self enforcement Influence of an outside population of a resource
Carrying Capacities	30	For tourism on a small island Cruise and water activity Aggregation of extracted resource (conch)	
Co-management (empowerment)	240	Community led management, Participatory management Participatory planning Tragedy of the Commons	More implementation not planning (or monitoring and evaluation of such)
Vulnerability of population sectors	190	Jobs, economic risk, crime and social justice. Mental health National economic risk (about 1/3 deal with environmental risk and vulnerability)	

Main topic	Number of references	Detailed topics	Potential researchable gaps
Tourism vs. fisheries conflicts	50	Shared resource conflicts (e.g reef)	
Big hotels vs home stays	20	Entrepreneurism, food supply to large hotels, optimum sizes of hotels, inclusive hotels and effects	Carrying capacity Marketing
Access and property	170	Multiple meaning obscure the issues; access to natural resources, social safety nets (e.g. health),	Common property management
Island Systems Maangement	50	Small Island Developing Nations - international networking Impacts of sectoral activities on small islands Vulnerability - economically (decreasing agriculture increasing tourism). Environmental management	

### **Some limitations on the literature study.**

The database attempted to glean information from a wide variety of sources, and to use in the first instance, the widest definition of the Caribbean, coastal communities, natural resources and livelihood strategies. Many of the references captured using this method have been revealed of minimal importance to coastal zone. However, in the conceptual framework for the project, it is acknowledged that issues have varying degrees of important to livelihoods on the coastal zone. It is hoped that by using the pyramid structure to sift relevant information, the more important references have been found within the context of wider Caribbean coastal literature.

Very few references deal directly with the poor within a community, or discriminate between the poor in the country generally and those who are the poor reliant on coastal resources for their livelihoods. Where the references are coastal in nature, a preponderance deal with a natural resource management or institutional perspective. Where community aspects are involved, they are often dealt with as agents of resource degradation or as stakeholders in resource. Very few articles deal directly with livelihoods aspects, particularly the choices of individuals given the resource opportunities and constraints they have.

Searching the database has proved difficult for some key concepts. The database has picked up many old references. Although it is difficult to trace all the issues historically, it is apparent that some terminology (e.g. sustainable, livelihoods) are recent in literature, and you may find references in the past which cover similar concepts with different terms. There are also trends in the areas covered. Although pioneer references in each topic may be found much earlier, the following indicates when a mass of references appeared. 1970's references dealt with sectoral reports and economic development through export, cash crops and extraction. Conservation management references rapidly increase in the 1980's, followed closely by institutional reform issues. Social and microeconomic issues become more widespread in the late 1980's as well. Finally, more cross cutting and holistic references are apparent from the beginning of the 1990s.

Major trends in the references suggest that work on the natural resource, its presence, form and process have been comprehensively covered, but authors comments in these papers (even recently) suggest we still do not know enough about the resource base. The reasons for this

may be a lack of monitoring programmes (long term processes are not being documented) or a lack of understanding of the basic process. Linkages between people and their natural resource is being studied but there remain many causes and reactions, effects on natural resource and effects on people, which are not being studied. On the landward side, references dealing with the upstream downstream interactions between communities have developed with watershed analysis. On the seaward side of the coast, papers on conflict resolution *in situ* and resource degradation are common, but the comparison of the effect of different livelihood activities in proximity to one another is rare.

The raw statistics serve only as a preliminary guide to the breadth and range of topics covered by the references found, and can only give the crudest of indications where studies have occurred and what topics are of interest. The details in the 1000 references reviewed show some more of the detail of what has been studied, and the quality of those references.

***What we were able to cover in terms of references?***

It is acknowledged that the review may not have captured all the relevant databases within the time period of the study, but it is hoped that with the consultation with the virtual steering group on project start up, a wide search of published literature and access to some grey literature by researchers, managers and donors in the region, that a reasonably balanced picture has been built up.

Some criticisms during the validation workshop suggested that the review had missed vitally important databases. On reflection, many important references from these collections were already sourced from other databases, and the focus of these new sources may not be targeted directly at the coastal zone livelihoods within the DFID NRSP focus (many mentioned have a purely natural resource / biological focus). A detailed assessment of how relevant these data sources are is not possible at this late stage, but if the process of reference collection is to be sustained, there will be opportunities to refine and update the content and usefulness of the database.

## 5C. INDICATORS REVIEW

### Collection and Value

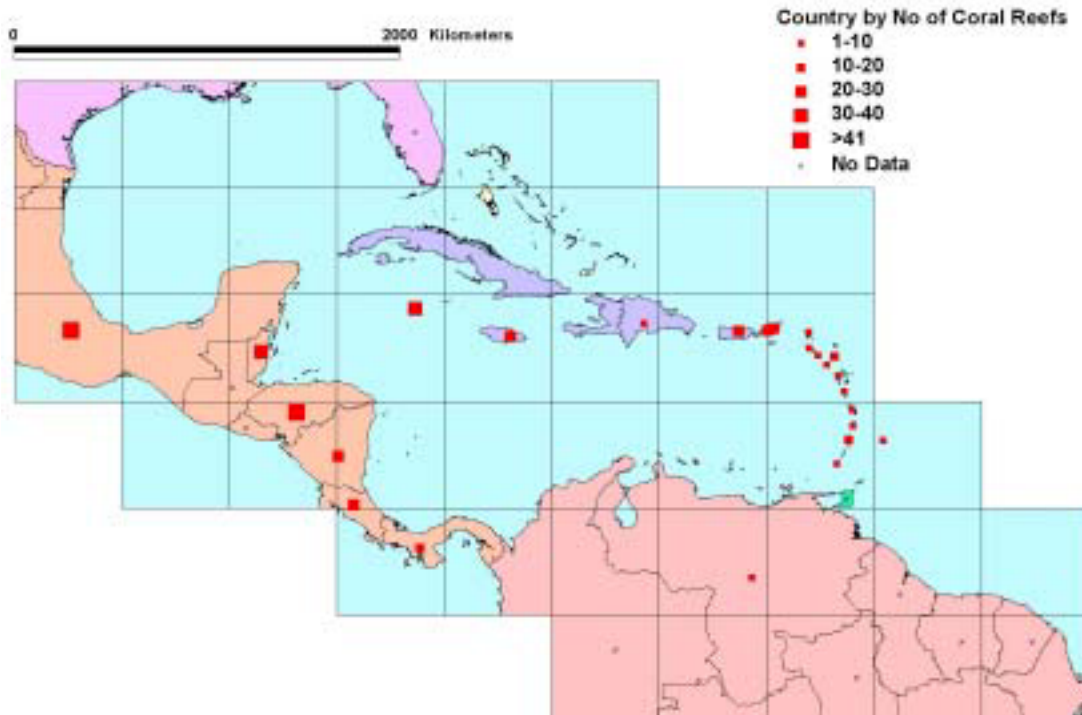
In every country of the world statistics are gathered on a diverse range of natural, social and economic bases, at regional, national or local various scales. As part of the survey, we have scanned a series of different sources for useful indicators of opportunity and constraint to coastal livelihoods. None of these are direct measures of coastal livelihood, but may be of some surrogate use.

Indicators could be of use in monitoring and evaluating the effectiveness of research and development interventions if they can be carefully targeted. Primarily, we looked for indicators which gave an impression of relative capital in each of the six boxes (see Table 5C.1 below).

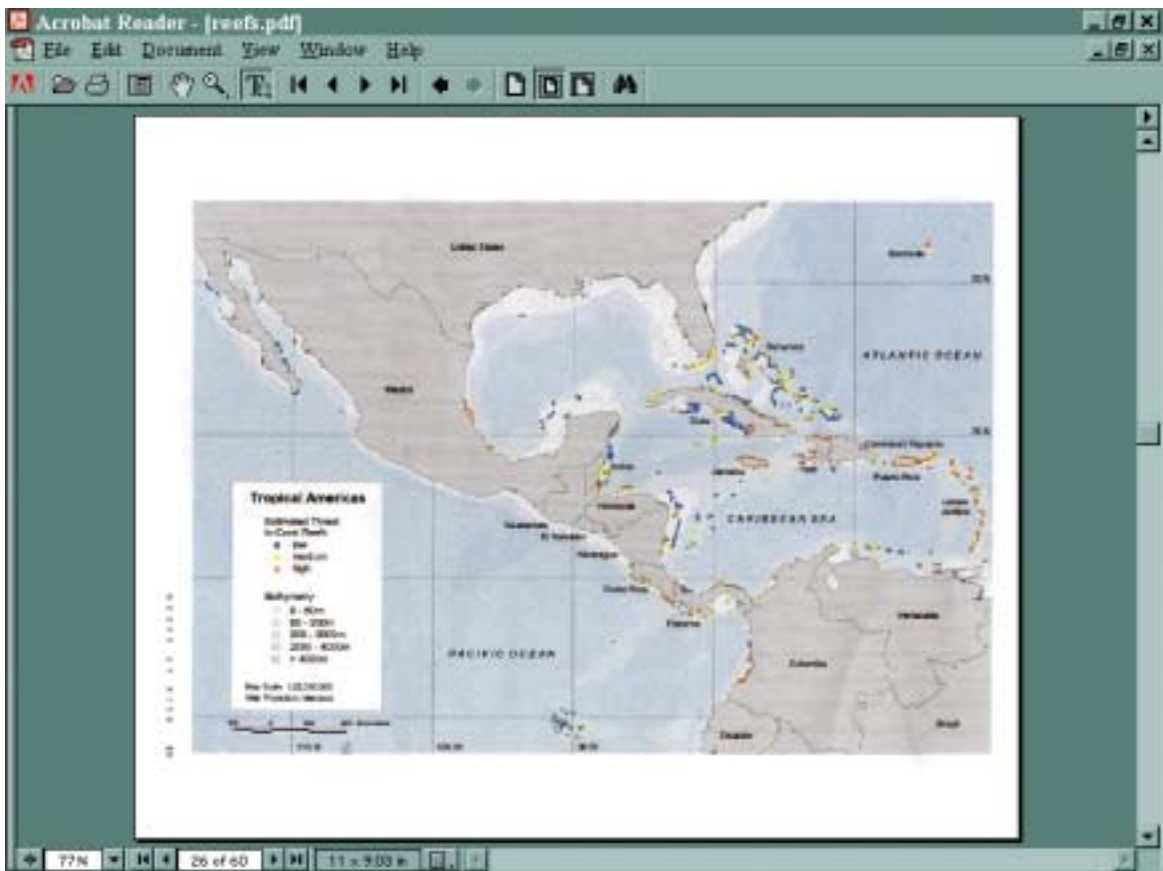
**Table 5C.1 Potential areas and examples of indicators and indices.**

<b>Box</b>	<b>Indicator areas and examples</b>
Box 6: Formal social capital	GDP (total), per capita, National debt
Box 5: Informal Social Capital	Education figures Literacy rates
Box 4: Human resources	Population Health Human Development Indices
Box 3: Livelihoods	GDP per sector Fishing boat numbers Fish catch Produce (tonnes etc.)
Box 2: Extracted resource	Amount extracted
Box 1. Support Ecosystem	Quantity and Quality of resource

In terms of single indicators, the following give examples of how the countries can be rated across the region. The first is an example of quantity of resource, giving the number of coral reefs recorded by REEFBASE.

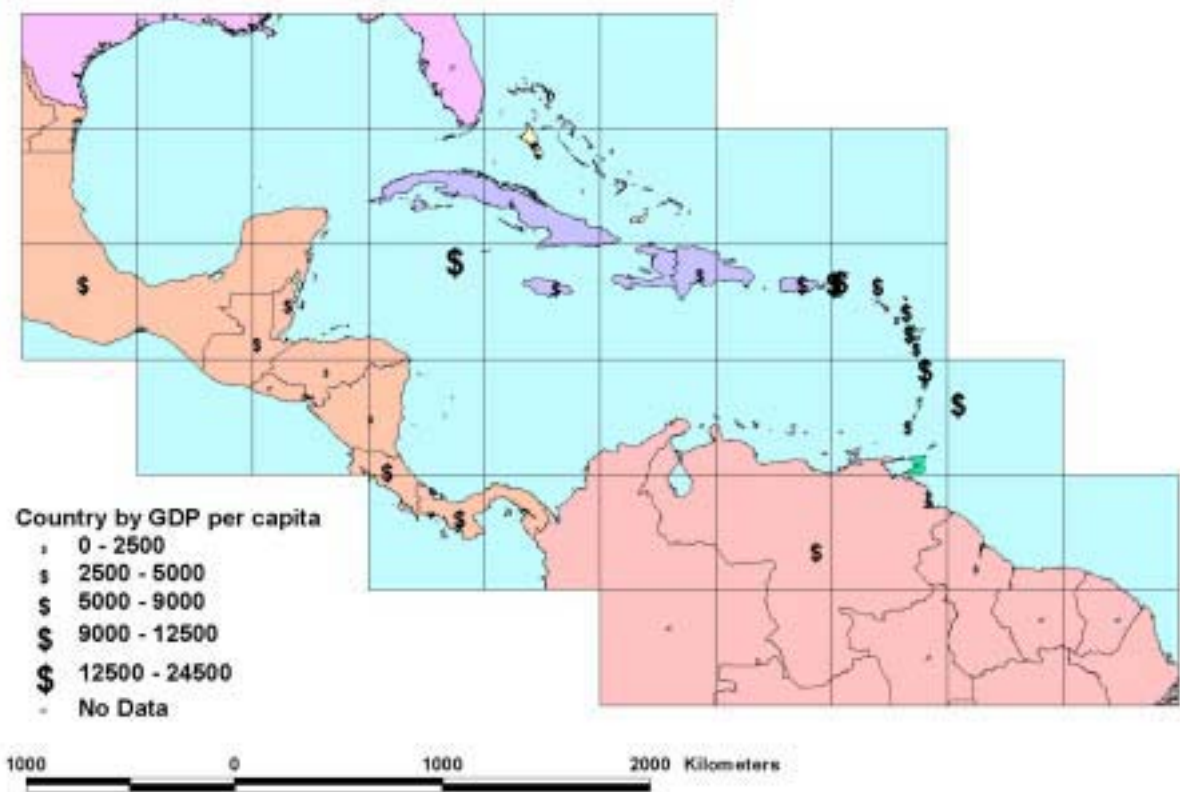


The second deals with quality of resource, again reef. This example also demonstrates that international organisations and programmes are already usefully monitoring the land water interface. The example shown here is from building up a model of different threats and habitat status to decide which reefs are healthy. The picture shows that many of the Antilles reefs are under severe stress, although some of the largest islands (e.g. Cuba) have areas that are relatively healthy. The Bahamas and Turks and Caicos are under less stress, but the reefs of Central America, although less extensive, are generally more healthy.

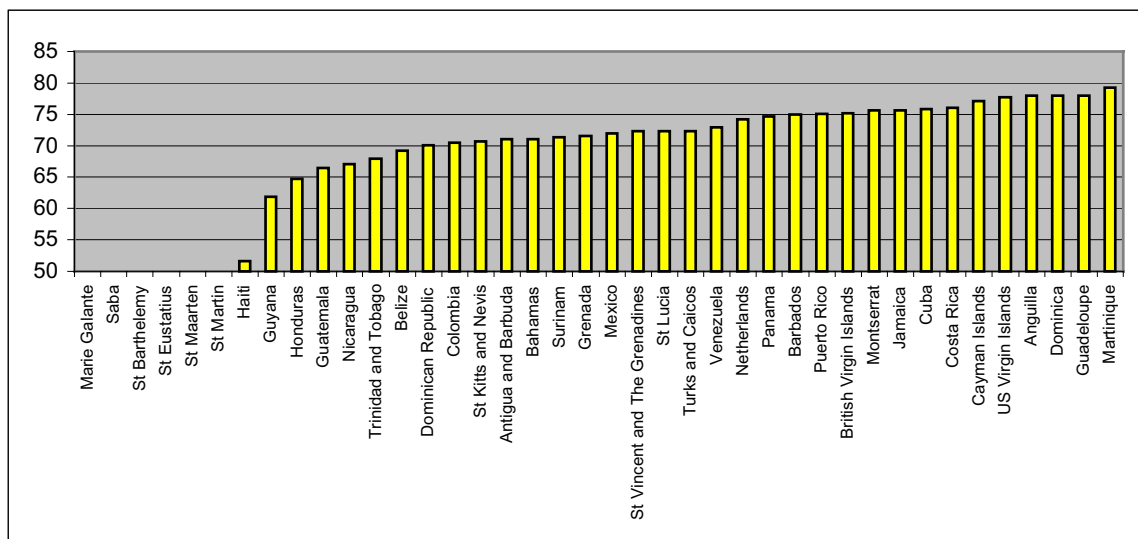


For human resources, a simple indicator of financial capital is GDP per capita. The pattern here shows the overall extent of the difference in poverty between the continental and middle income island states. Tax havens (Turks and Caicos, Cayman and the Virgin Islands) stand out. The level of aggregation hides pockets of absolute poverty, especially on the islands, some of which rely on the coastal resources for their livelihoods to a great degree.





Another measure that can be used as an indicator of human resource status is the percentage literacy rate. Note that on the chart below, the relative difference between states in the Wider Caribbean is negligible, with the marked exception of Haiti.



Two complementary problems can be identified with the regional application of indicators of use to the coastal zone. Primarily, they are only available at an aggregated level (usually national) and so can give little indication of the relative poverty or resource level of the coastal region (ignoring for the time being the loose definition of what is coastal). Where large geographical scale (district or better) statistics are available, they are rarely available for more than one small study region or a country at best. Never do these statistics become available at a regional level. Sometimes similar indicators can be found for more than one country, but because of the methods of collection, the timeliness, the nature of the data themselves or the unit of aggregation, it is difficult to compare these.

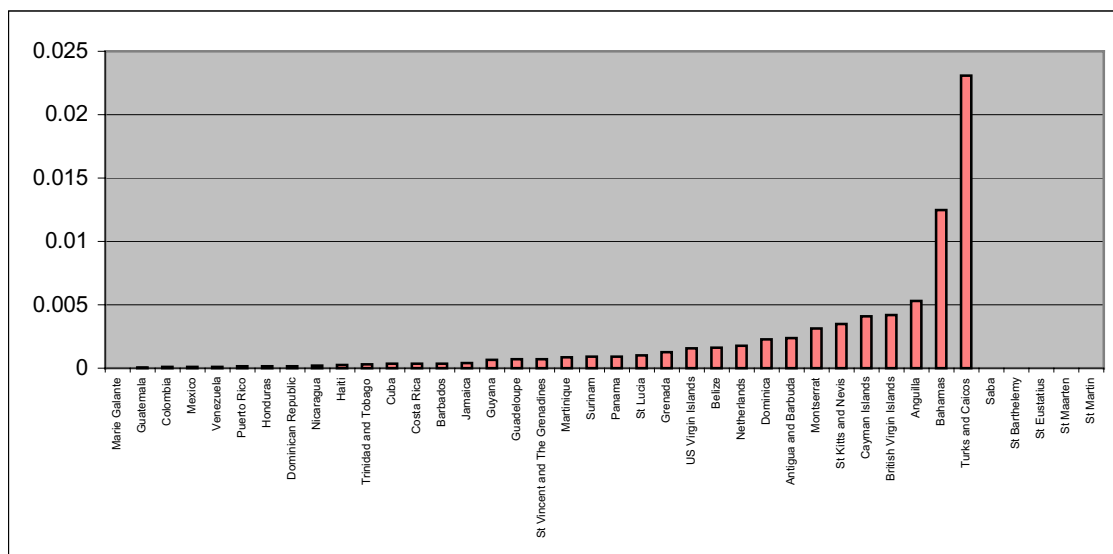
Finally, indicators look at only one particular aspect of livelihoods, and cannot give a more general and applicable feel within the level of community of individual comfort, well being or security. Indices, taking various parameters of livelihoods and weighting them accordingly to create a single number representing a wide range of issues, is a way of dealing with this.

Ideally to monitor coastal livelihood opportunity and constraints, there are four major areas where indices would be of use:

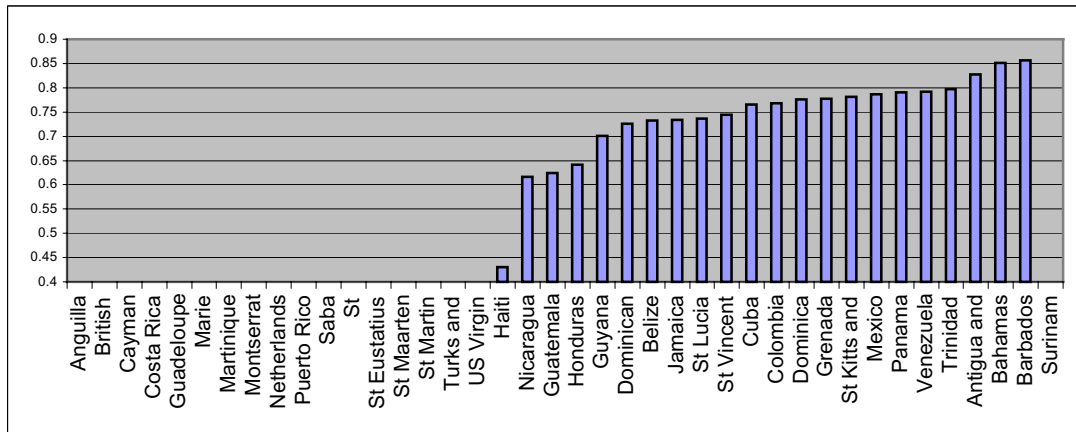
- identifying pressure on resources;
- establishing poverty levels and sectors of population in the defined category;
- measures of economic, social and personal vulnerability;

- measures of available opportunities and measurable constraints to livelihood and development.

In this project some indices were created by combining indicators from various sources. For example, for characterising pressure on resource, the amount of coastline available to each individual, or the number of people in each kilometre of coastline (chart below) is a useful first step.



The Human Development Index (UNDP) takes several indicators and merges them, producing the comparative chart below



The wide range of administrations in Caribbean (State, overseas territory, dependency, department, large island/ small island, archipelago), makes it difficult to compare indices of human population status in the region.

## 5D. PROJECTS REVIEW - RESEARCH ACTIVITY

### Data Collection

Complete coverage of the literature dealing with issues of sustainable livelihood opportunities and constraints in the Caribbean is impossible, since many of the issues are dealt with on a day to day basis by aid, governmental and private projects and programmes throughout the region. Only rarely is the literature available on the findings of such projects, and the only way to access this information is through personal contacts or through project documents stored in restricted locations.

A data table within the database was created in an attempt to characterise the types of projects under way. Projects were ill defined as work that has been conducted in the coastal zone on livelihoods and their relationships with their natural capital.

It was not possible to cover all the projects ongoing in the region.

A more effective method was to ask the participants of the Barbados Workshop, which of the key issues for research highlighted by that workshop were being investigated by groups either within or outside the region. The table below summarises this information:

**Table 5D.1 Working Group Concerns and Researching Institutions**

### WORKING GROUP 1

No	Item/Concern	Researchers
1*	<b>Factors affecting sustainable livelihood choices &amp; strategies</b> (conflict management; resource access; institutional arrangements; self-employed vs formally employed; migration & remittances)	CANARI, UEA
2*	<b>Institutional arrangements (including organisations) for policy assessments</b> (regional and national organisations; sustainable livelihoods; endowment of the poor)	CANARI, CARICAD, IMA
3	<b>Impact of nautical tourism</b> Pollution, livelihood, BMP, CBAs	CTO, ECLAC, IMA, CEHI
4	<b>Identification and development of sustainability indicators</b> Should be appropriate, measurable and participatory	OECS, CARICOM, FAO, GOVTS, CDB, SEDU
5	<b>Economic valuation models</b> Including land resource use, resource management, livelihood strategies, adaptation/flexibility	WRI, WB, UWI, CPACC, ICLARM
6	<b>Impact of watershed management practices on LWI resources and review of BMPs</b>	UNEP, CEHI, IRF, IMA, CATHALAC

\* = identified as a priority concern by group members

### GROUP 2

No	Item/Concern	Researchers
1*	<b>Co-management</b> Concern was to focus on <i>participatory integrated NRM</i> so as to alleviate poverty, support enforcement and reduce pollution Eg: 1a. Empowerment of fisherfolk (vessel management systems, - GPS, VHF radios)	IMA, CCAM, CANARI, LWI

No	Item/Concern	Researchers
	1b. Environmental management (monitoring water quality & in collaboration with coast guards assist in NR protection 2. Empower private sector in NRM Eg. Dive operators, reef tour operators, sports fishing operators fisher/fish processors 3. Review legislation/regulations for effectiveness	
2.	<b>Tourism vs fisheries</b>	CCA, IMA
3.	<b>Land and sea pollution</b>	CEHI, UNEP, CCAM, IMA
4.	<b>Enforcement</b>	CCAM
5.	<b>Access and property</b>	CERMES (UWI)

### GROUP 3

No	Item/Concern	Researchers
1*	<b>Feasibility studies on community-based tourism</b> <b>To include</b> Characteristics and qualities of resource, including attractions; Carrying capacity Stakeholder/power analysis Baseline biophysical/socio-economic evaluations Community cohesion Vulnerability Decision analysis Marketing	CANARI, CCA, CCAM, IMA, CTO, EU, SCALES, SEDU
2	<b>Baseline environmental and economic valuation to support poverty alleviation</b>	WRI, WB, UWI, CPACC, ICLARM CFRAMP, GOVTs, UNEP, IMA, CEHI, CCAM
3	<b>Decision analyses on the uptake of strategies and initiatives</b>	None
4	<b>Vulnerability analysis &amp; community adaptation/recovery</b>	CPACC, CDERA, WB, Red Cross, SIDS, Comm Sec
5	<b>Community cohesion – obstacles and strategies</b>	None
6	<b>Alternatives to tourism</b>	Not done
7	<b>Agro-tourism</b>	Not done

#### GROUP 4

<b>No</b>	<b>Item/Concern</b>	<b>Researchers</b>
1	<b>Sustainable alternatives to current livelihood patterns</b> Stakeholders, donors, governments	CANARI, CCAM
2	<b>Capacity analysis for stakeholder participation</b> Present capacity (donors/stakeholders) needs to increase	CANARI, CCAM, CCA
3	<b>Inter-institutional linkages</b> LWI – uptake of outputs (NR manager)	LWI
4	Capacity for regional integrated management mechanisms Donors, regional networks, early warning systems	CFRAMP, ECLAC
5	<b>Problems and best practice for liquid waste management for remote coastal villages</b> Stakeholders, Govts	None
6	<b>Valuation of resources for LWI</b> Establishing a framework for national authorities to value their NR for LWI	CANARI, CCA, CCAM, IMA, CTO, EU, SCALES, SEDU

#### GROUP 5

<b>No</b>	<b>Item/Concern</b>	<b>Researchers</b>
1	<b>Socio-economic criteria/evaluation for NR policy management</b>	WB, UWI, SEDU, CERMES
2	<b>Globalisation impacts on local communities (specially fisheries)</b> Cuba – tourism, bananas...	None
3	<b>Compliance particularly techniques</b>	CCAM
4	<b>Co-management</b> Socio-economic impacts on livelihoods (what difference does it make?) Mechanisms for creating, maintaining (sustaining) managing (govt, institutional capacity)	WRI, WB, UWI, CPACC, ICLARM CFRAMP, GOVTs, UNEP, IMA, CEHI, CCAM
5	<b>Understanding livelihood strategies</b> <b>Responses to negative (eg migration) and positive influences</b>	CANARI, CCAM

#### Monitoring resources

In addition, this section has the list of country by country references to the types and levels of details of resources mapped. These can be found in Appendix 7 and in the attached database.

It shows that in terms of some natural resources, there is sufficient global concern for resources (reefs and mangroves). For others, there is a regional significance (e.g. fisheries by CARICOM). Other resources are looked after at a national scale (agriculture (although some sectors - especially export) are monitored at a regional level).

## SECTION 6. COUNTRY STUDIES: SOCIAL AND ECONOMIC ISSUES

The community field study results follow in relation to the conceptual framework presented in Section 3. The conclusions from this field work will pull the elements together and identify implications for regional issues in relation to improved livelihood outcomes.

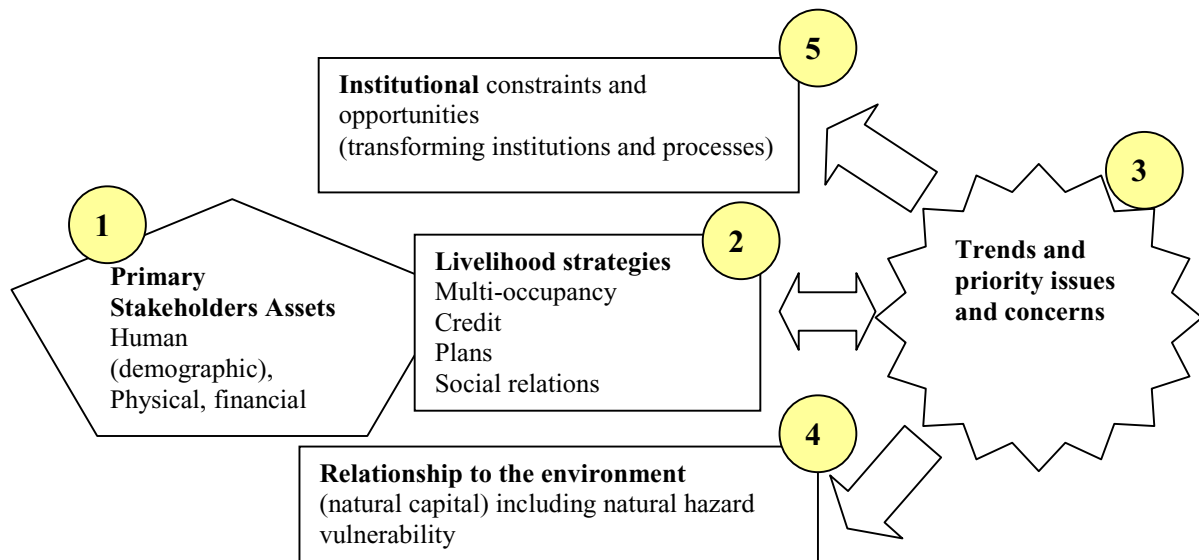


Fig 6.1 Broadly adapted from DFID Sustainable rural livelihoods framework (Carney, 1998)

### Primary Stakeholders and their Assets

The methods section (Section 2). identifies the basic coastal stakeholder groups in Tobago and Portland Bight, Jamaica. The results of the community meetings (Appendix 2) and subsequent interview groups identified (Section 2, Figure 2.3) clearly indicate a major role for the fishers in the coastal community, with their associated groups - processors and buyers, plus, in Jamaica boat and net repairers and fish scalers. In Jamaica the fishers interviewed can be all considered artisanal, working from 7-14m (20-40 ft) pirogues powered by outboard engines. In Jamaica they were more likely to be crew members than boat owners. Still closely associated with the shores and coasts were tour-boat and beach bar operators.

The wider community, especially small shopkeepers and vendors, local transporters, the unemployed and the formally employed) was seen as important, and were investigated in detail in Jamaica. In both countries small scale farmers were seen as important members of the coastal community. While still essentially coastal, Bon Accord in Tobago and Bushy Park in Jamaica provided information on slightly more inland/urban conditions. In Tobago, unlike the south coast of Jamaica, the whole hotel and guesthouse industry also provide important stakeholder groups.

The basic structures of the coastal communities in Jamaica and Tobago were found to be similar, with the important difference that Tobago has an established tourist industry, largely based in the western part. In Jamaica there is only local (mostly weekend) tourism from Kingston to specific areas. This part of the report will thus examine the characteristics and differences between the countries, communities and stakeholders groups, and identify locally perceived opportunities and threats to the coastal communities. Throughout the report, due to



the low sample size, we have not used statistical tests and have instead looked for clear trends and the qualitative nature of responses.

### **Demographic Issues**

**Household size:** Using household sizes as a measure of maturity (household life cycle) there appears to be little variation between the two countries with figures of 4.35 for Jamaica and 4.34 for Tobago. There are, however, variations in the distribution of these, with the modal size in Tobago being 4 (tailing off on both sides) and nuclear families being the predominant structure with very few large households. In Jamaica the distribution is more complicated – multi-modal – with highest frequencies in size groups 3 and 6, but with significant and similar numbers in sizes 1,2, 4 and 5, though again with very few large households. There are significant numbers of one person households, particularly in Jamaica.

**Age:** Those interviewed in Tobago had an average age of 43.1 compared to 35.5 in Jamaica<sup>4</sup>. This is in line with national statistics for the two countries<sup>5</sup>. Those interviewed in Tobago were 10 years older (40-50) compared to Jamaica (30-40) across all occupations, except among fish processors and tour-boat operators where this was reversed. Others points to note include the old ages of fishers and farmers in Tobago (particularly the latter) who were all in the 60+ age group. The youngest occupational groups were unemployed and the beach-bar operators in Jamaica.

**Length of stay:** Generally this was difficult to disaggregate, with no pattern by occupation or by country. However, residents will have moved more recently in the more urban areas, and a greater proportion of those who have lived their whole life in the same place have been in the more remote rural areas.

### **Physical and Financial Assets**

**Asset Ownership.** Figure 6.2 highlights the distribution of some household assets in Jamaica and Tobago. Ownership of assets generally increases moving left to right in the figure and clearly indicates higher levels in Tobago. Within this pattern there are some interesting variations, with Jamaicans having higher proportions in the second highest category than Tobagonians. However once ownership of computers is added into this, Jamaican ownership drops off markedly, indicating poor access to information technology (and all this may imply). The graphs of asset ownership clearly indicate that Tobagonians generally own more than Jamaicans. Other tests showed that this was not due to age or gender.

When ownership of all assets<sup>6</sup> is taken into account a much more significant gap opens up between the two countries. Table 6.1 clearly indicates that not only is asset ownership higher in Tobago it is also more evenly spread. In Jamaica most of those interviewed had very low asset ownership, with 70% of interviewees scoring less than 4<sup>7</sup> (compared to 31% in Tobago). Overall scores in Jamaica were less than half of those in Tobago.

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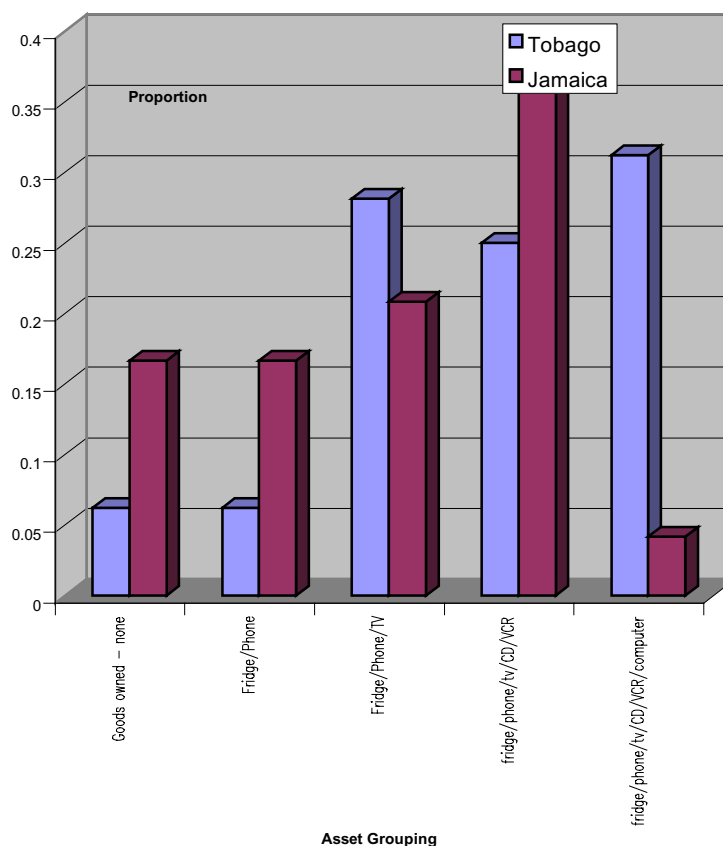
<sup>4</sup> Using class mid-ranges to calculate this.

<sup>5</sup> CIA (2000) indicates a younger age structure in Jamaica.

<sup>6</sup> General household items identified in Figure 6.2 plus cars, boats, animals and land

<sup>7</sup> Indicating very low ownership of assets

**Figure 6.2 Ownership of Assets**



**Table 6.1 Proportion of Surveyed Households in Different Wealth Strata**

<b>Wealth Score (Range)</b>	<b>Tobago</b>	<b>Jamaica</b>
<b>1-4 (very few)</b>	0.31	0.69
<b>5-8 (+household goods)</b>	0.41	0.29
<b>9-12 (+car or boat/land)</b>	0.28	0.04
<b>&gt;12 (all possible assets)</b>	0	0
<b>Average Score</b>	6.56	3.59

Following this, all the identified assets were given a weighted score to calculate a wealth index for each household. The following had a score of 1 – ownership of small animals, ownership of large animals; the following a score of 2 – boat, car, house, land; other household items detailed in the first graph were given a score of 0-4 in line with the graph hierarchy. This makes a possible total score of 14; the distribution (and average of this) is shown below:

**Table 6.2 Overall Rank order of asset ownership scores by occupational group**

<b>Occupational Group</b>	<b>Tobago</b>	<b>Rank</b>	<b>Jamaica</b>	<b>Rank</b>
<b>Fishers</b>	5.36	8	3.82	11
<b>Fish Processor</b>	10	2	3	14
<b>Fisher-Ancillary</b>	-		3	14

<b>Tourboat Operator</b>	6.66	6	6	7
<b>Resort Owners</b>	11	1	-	
<b>Guesthouse Owners</b>	8	3	-	
<b>Beach/Bar Operators</b>	7	5	2.33	15
<b>Vendor</b>	6	7	1.33	16
<b>Shopkeeper</b>	4	10	3.66	12
<b>Transport</b>	-		5.33	9
<b>Formal Employment</b>	-		3	14
<b>Housewife</b>	-		3	14
<b>Teacher</b>	-		6	7
<b>Unemployed</b>	3.5	13	3.5	13
<b>Coalburner</b>	-		0	17
<b>Farmer</b>	7.75	4	3.5	13

In general terms Table 6.2 does not provide any surprising patterns, with the wealthiest groups being those based in Tobago and involved in tourism. The poorest groups are in Jamaica and are generally concerned with fisheries, are unemployed or involved in vending. Within these general patterns there are some interesting variations within groups and across countries. There are big differences between fish processors farmers, beach-bar operators, vendors and fishers, with all these being much wealthier in Tobago than Jamaica, but with each case having a unique explanation. This is most marked in fish processors, with differences explained by the scale of operation between the two locations<sup>8</sup> and also by the nature of the industries in the two countries. Further support for this notion is provided by the differences in wealth within the fishers group (implying also a greater scale of operation) and can perhaps be used to explain other variations within groups. It is important to note that nothing presented in this table is statistically significant as some 'groups' only consisted of one household. All data should be treated as qualitative.

Financial assets are discussed later within credit use and access section.

**Service Access.** There are some significant differences between the two countries with regard to service access. Jamaica has slightly lower access to electricity and piped water. There are however big differences between Jamaica and Tobago in access to (land) telephones, with less than half of the Jamaicans having this, primarily due to the lack of land lines in some communities. In these places there is noticeably higher cell phone ownership. There is also some difference in cooking methods with virtually all people cooking by gas in Tobago, but with a more mixed picture in Jamaica - about half on gas and the rest from charcoal and wood (plus non-responses).

There are also marked difference in toilet facilities with private (flush) toilets dominating in Tobago and a mixture in Jamaica of flush and pit facilities (plus greater incidence of shared facilities).

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<sup>8</sup> Large scale in Tobago and very small in Jamaica

## Livelihood strategies

**Multi-Occupancy.** Figure 6.3 indicates that multi-occupancy of jobs is more common in Tobago with  $\frac{3}{4}$  having at least one other source of income. In Jamaica this figure is less than  $\frac{1}{2}$ , with virtually all the rest just having 1 other source of income. There is some debate within the development literature as to whether multi-occupancy is indicative of stress or opportunity. Much of this argues that distress is the principal explanatory variable of multi-occupancy and this would appear to be counter-intuitive with regard to Tobago and its relative position to Jamaica.

Figure 6.3 Number of Other Income Sources

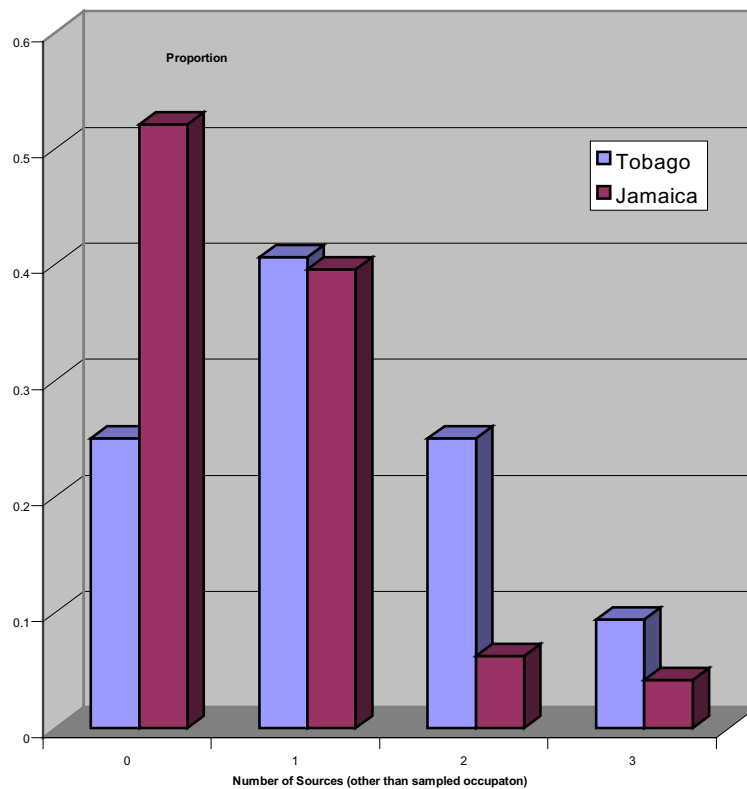


Table 6.3 Average Number of Additional Income (Besides Sampled Occupation) by occupation group

Occupational Group	Tobago	Jamaica
<b>Fishers</b>	1.45	0.47
<b>Fish Processor</b>	1	3
<b>Fisher-Ancillary</b>	-	0.5
<b>Tourboat Operator</b>	1	3
<b>Resort Owners</b>	1	-
<b>Guesthouse Owners</b>	1	-
<b>Beach/Bar Operators</b>	1	0
<b>Vendor</b>	0.33	0.67
<b>Shopkeeper</b>	1	0.83
<b>Transport</b>	-	0.66
<b>Formal Employment</b>	-	0
<b>Housewife</b>	-	1
<b>Teacher</b>	-	0.5
<b>Unemployed</b>	1	0.5
<b>Coalburner</b>	-	1
<b>Farmer</b>	1.5	1
<b>Average</b>	1.18	0.63

Assessment by occupational group provides further insights. Table 6.3 indicates that there is a major difference between the two countries with usually equivalent differences within occupational groupings. This would suggest that higher multi-occupancy in Tobago is as a result of economic opportunity (and a more financially enabling environment). Within Tobago there is little variation between the groups, and there does not appear to be a higher incidence amongst the poorer groups. In Jamaica the pattern is harder to ascertain and appears to be more bi-modal, with the wealthiest and poorest groups having the greatest numbers of occupations. However the wealthier groups have the greatest range of occupations and this perhaps indicates that multi-occupancy is a function of economic opportunity and an enabling environment (financial and institutional). Tobago scores higher on both accounts, having a higher national income (GDP/capita twice that of Jamaica), significant and positive GDP growth, and more accessible financial services (and generally greater institutional access and development – see later sections on this). Access to credit is a key part of individuals' financial capital and the next sub-section considers of this. The number of occupations was greater in the more urban linked areas (Bushy Park in Jamaica and Bon Accord in Tobago).

For fishers in Jamaica fishing remains one of the main sources of income with few supplementary incomes. In Tobago, however, fishers may also have government jobs and farms, while also being involved in running guest houses. Government jobs provided important income to several groups in Tobago (especially the farmers) while not necessarily being their culturally felt and time consuming livelihood. Pensions and national insurance payments were also important in Tobago, while in Jamaica remittances formed a an importance source of income for 11 interviewees.

**Use and Access to Credit.** Figure 6.4 indicates that virtually all surveyed households in Jamaica have never had access to or used credit. The situation is rather different in Tobago where more than half of the surveyed households having used credit in the past. Taking an average of the credit scoring presented in Table 6.4 indicates that averages across the countries confirm this pattern. It also indicates that access to credit is inadequate in both

countries. The situation is much better in Tobago, especially for some livelihood groups – generally the wealthier groups such as resort owners.

**Figure 6.4 Use/Access to Credit**

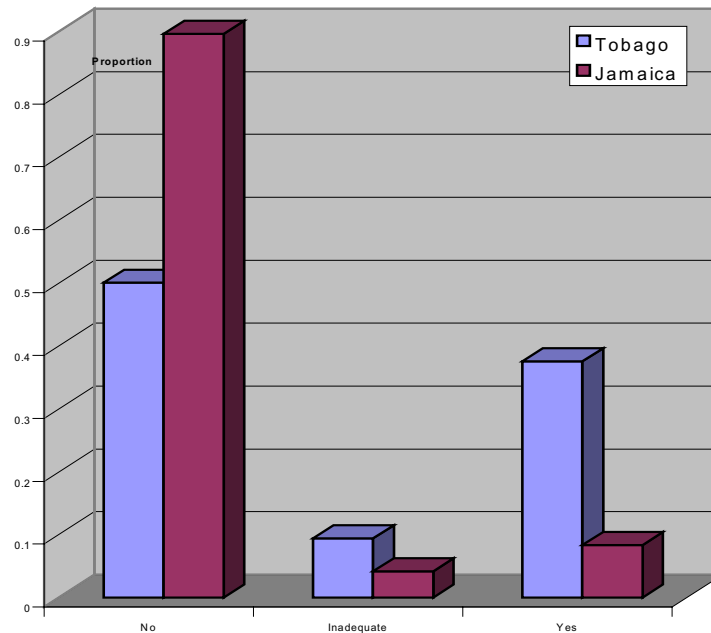


Table 6.4 provides some detail on the marked variations between the occupational groups as well as the overall picture in the two countries. Even in Tobago there are only two groups who score greater than 1 (i.e. having more than adequate access to credit) and these are two of the wealthier groupings (resort owners and tour-boat operators). The rest of the Tobagonian groups (bar two) have scores greater than zero (some access and use). Vendors and shopkeepers did not have access. The situation in Jamaica is rather different with 10 groups out of 14 having no access. Four groups with some access rated it overall as inadequate for their requirements. (It is interesting to note that these groups were not the wealthiest). The most important factor highlighted by both Table 6.4 and Figure 6.3 is the variation between the two countries. It indicates a real lack of access to financial services in Jamaican coastal dwellers.

**Table 6.4 Access to Credit (Score)**

<b>Occupational Group</b>	<b>Tobago</b>	<b>Jamaica</b>
<b>Fishers</b>	0.8	0.3
<b>Fish Processor</b>	1	0
<b>Fisher-Ancillary</b>	-	0
<b>Tourboat Operator</b>	1.3	0
<b>Resort Owners</b>	2	-
<b>Guesthouse Owners</b>	1	-
<b>Beach/Bar Operators</b>	1	0
<b>Vendor</b>	0	0
<b>Shopkeeper</b>	0	0.2
<b>Transport</b>	-	0.7
<b>Formal Employment</b>	-	0

<b>Housewife</b>	-	0
<b>Teacher</b>	-	0
<b>Unemployed</b>	0.5	0
<b>Farmer</b>	0.5	1
<b>Coalburner</b>	-	0
<b>Average</b>	0.84	0.21

Scored on the following basis for each household and then averaged by occupational group and country:  
2=yes/OK, 1=inadequate access, 0=no access

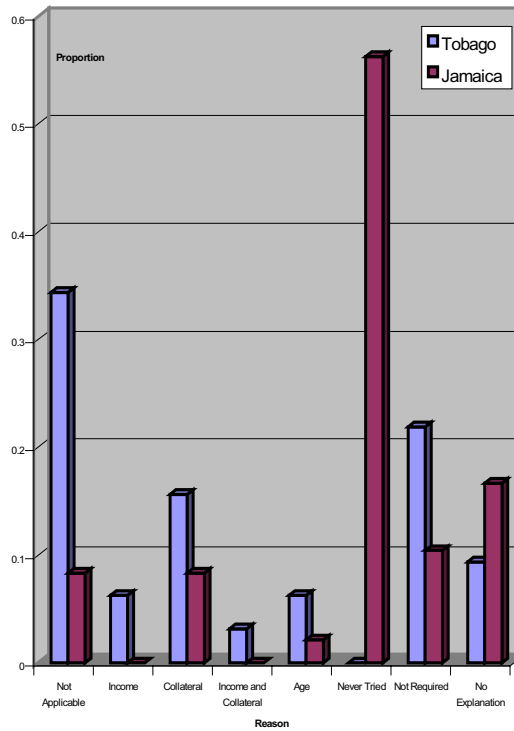
Figure 6.5 provides further insight into the de-linking of certain groups from formal financial services and their lack of access to credit. The figures that are presented in this graph are only concerned with respondents who either had no, or inadequate access, and clearly rules out a significant proportion of satisfied customers in Tobago and a small proportion of households in Jamaica. Of those who are left, the largest group is those who have never tried to use credit (more than half in Jamaica) – a very strong indication of complete de-linking. In some cases approaches have been made to financial institutions and credit has been refused, for reasons including inadequate collateral (both countries), insufficient income (for fish gear – Tobago only) and age.

This gives the impression that there may be little in the way of formal savings behaviour, particularly in Jamaica. However, this is not the case, as high proportions of households save in each country (26/32 in Tobago and 38/48 in Jamaica). A significant proportion of this is with formal institutions: commercial banks 20/32 (Tobago) and 24/48 (Jamaica); credit unions 7/32 (Tobago) and 6/48 (Jamaica). There is also high membership of rotating savings and credit associations (Partner/Susu) in Jamaica (27/48) and some membership in Tobago (4/32). Broader investment activity (stock market based) is restricted in Tobago (13/32) but is completely non-existent in Jamaica. Some of these figures appear to contradict each other with respect to Jamaica – membership of partnership associations is high, but access to credit is low. This may be explained by the relatively slow rotation through partnership lists and low contribution levels (see Handa and Kirton, 1999, for a more detailed assessment).

### **Social relations and livelihoods**

**General positive and negative relations:** In Jamaica respondents were reticent to indicate whether they had positive or negative relations with livelihood groups. In Jamaica the major positive livelihood relationships related to those within the community - mostly in relation to selling and buying of fish. In Tobago there was a much broader range of linkages to processors and more distant buyers, as well as to the small scale tourism sector (restaurants, guest houses) also by farmers and fishers.

**Figure 6.5 Reasons for non-use/access to credit**



On the negative side there was mention of damaging practices (dynamiting, crop damage, and piracy) in Jamaica, whereas the most important conflicts in Tobago related to unfair treatment in relation to the hotel industry and conflicts between tour-boat operators and fishers, and with church groups.

**Family relations:** The data were not sufficient to be able to ascertain trends in family relations in relation to livelihoods, but there were several mentions in both countries of separated or divorced couples, dual family incomes, and mutually reinforcing livelihoods. In Jamaica these occurred between fishers and their fish vendor wives, and in Tobago between a dive operator and beach restaurants run by his wife.

**Livelihood support groups:** The information collected in this area was concerned with assessing group membership and its effectiveness. Table 6.5 indicates that there is significant group membership in both countries, though the overall proportion is significantly lower in Jamaica. When social<sup>9</sup> groups are excluded these figures fall much further to only 17/32 in Tobago and 14/48 in Jamaica. The number of groups is much higher in Tobago and they are dominated by trade associations and social groupings; civil society institutions are absent among those surveyed in Tobago. The overall numbers are much smaller in Jamaica and are dominated by specific business groupings (e.g. all fishing co-ops), civil society and social groups.

Table 6.5 Types and frequency of group membership in Tobago and Jamaica

Type of Group	Number in Tobago	Number in Jamaica
Social	8	4
Political	5	1
Civil Society	0	4

<sup>9</sup> These consisted entirely of church and sports groups.



<b>Trade Association</b>	12	1
<b>Business Group/Co-op</b>	1	6
<b>NGO</b>	1	2
<b>Total</b>	27	18

In this table 'Social' is church and sports; 'Political' relates to parties and formal structures (village council etc.); 'Civil society' to things like citizens associations (not 'political' and not trade based); 'Trade associations' are broad regional/national groupings; and 'Business group/co-op' is based on business operation only. The totals will not match because some households are in more than one group.

Group effectiveness was investigated, though due to the small sample size little in the way of trends could be ascertained, apart from slightly greater group effectiveness in Tobago.

**Trends and Issues**  
**Current Financial Position/Household Wellbeing**

**Current Financial Position.** Figure 6.6 looks at households' perceptions of their financial position compared with 5 years ago. In Tobago people generally feel better off or the same compared with 5 years ago, the reverse is true for Jamaica with 60% saying they are worse off or the same. These figures are supported by the macro-economic trends in both countries.

**Figure 6.6 Current Financial Position Compared to Five Years Ago**

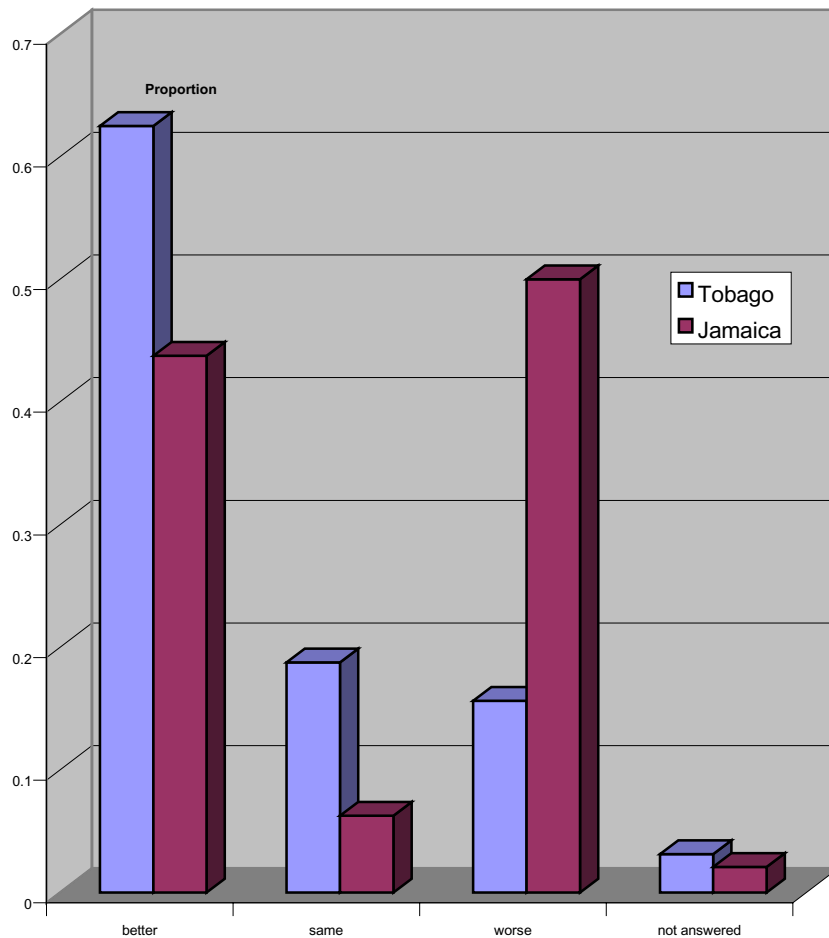


Table 6.7 also breaks down these general patterns by occupational group. In Tobago all groups perceived themselves to be either in the same financial position that they were five years ago or are better. The only exception to this is from the unemployed 'group' (one individual). The pattern in Jamaica is more varied with 6 groups perceiving themselves to be worse off, 6 groups feeling better, and 1 perceiving itself to be in a similar position to that of 5 years ago. A particularly interesting finding is that overall fishers in Jamaica rate themselves as better off compared to 5 years ago but at the same time complain of declining

catches. This is also closely reflected by fishers in Tobago, though they feel they are managing repayments better. Overall the comments made in Tobago relate to improved incomes, setting up independent business, better repayments, and tourism improving. In Jamaica communities indicate that are things are getting harder, 'money is not running', prices are up and the national economy is down.

**Table 6.7 Financial Position Compared to Five Years Ago by Occupation Group**

Country	Jamaica			Jamaica Total	Tobago			Tobago Total	Grand Total
	Occupational group	better	same		worse	Better	about the same		
fisher	10	1	5	16	5	3	2	10	26
fish processor	1			1	1		1	2	3
fisher - ancillary			4	4					4
Tourboat operator			1	1	3			3	4
Accommodation - large					1	1		2	2
Accommodation - small					2			2	2
beach/bar	2		3	5	3		1	4	9
Shopkeeper	1	1	4	6	2			2	8
vendor	1		2	3	1			1	4
transport	3			3					3
formal employment	1			1					1
housewife			1	1					1
teacher		1	1	2					2
unemployed			2	2		1	1	2	4
coal burner			1	1					1
farmer	2			2	3	1		4	6
<b>Grand Total</b>	<b>21</b>	<b>3</b>	<b>24</b>	<b>48</b>	<b>21</b>	<b>6</b>	<b>5</b>	<b>32</b>	<b>80</b>

**Income Improvement Plans** High proportions of respondents identified their involvement in either formulating or implementing income improvement plans – 26/32 in Tobago and 30/48 in Jamaica. However a lot of these plans were not well developed and it was necessary to separate them into three: probable impact (very likely to increase income if successful), possible impact (possible impact if successful), and unlikely (not realistic or properly thought out - more of a dream). Judgement was required in deciding upon each case but despite this it is thought that this produced a much better guide to likely improvement. The results are presented in Table 6.8. It indicates that the numbers who have serious plans (or those that are already being implemented) are much lower than the preliminary figure of 56.

**Table 6.8 Categorisation of Income Improvement Plans**

Category	Tobago	Jamaica
<b>Probable</b>	3	3
<b>Possible</b>	5	5
<b>Unlikely</b>	18	22
<b>Total</b>	<b>26</b>	<b>30</b>

Table 6.9 indicates the nature of income improvement plans (only those that are probable and possible from Table 8). In Tobago these all relate to either expansion of a current business or investment in a new (and often related, frequently tourism) business. In Jamaica it is a more mixed picture with the largest single group planning to increase fishing effort (even by non-fishers), with next equal being current business expansion and general market investment.

**Table 6.9 Nature of Income Improvement Plan**

<b>Improvement Type</b>	<b>Tobago</b>	<b>Jamaica</b>
<b>Business Expansion</b>	5	2
<b>New Business</b>	3	0
<b>Education</b>	0	1
<b>Fishing Effort</b>	0	3
<b>Investment (Markets)</b>	0	2
<b>Total</b>	8	8

Table 6.10 reviews the factors hindering income improvement plans (only where these were in the probable or unlikely category) and shows a wide range of factors in both countries. These are mixed but most relate to different aspects of finance in both countries. In Jamaica they are significantly related to lack of income. There are other less frequently mentioned constraints such as labour and land constraints (agriculture-specific) and also ‘significant’ numbers of individuals who do not identify any reason for their problems.

**Table 6.10 Factors Hindering Income Improvement Plans**

<b>Hindrance</b>	<b>Tobago</b>	<b>Jamaica</b>
<b>Finance (generic – not specified)</b>	8	3
<b>Income levels</b>	0	13
<b>Collateral</b>	2	0
<b>Afford (interest rates)</b>	1	0
<b>Credit turned down</b>	0	1
<b>Too risky (their perception)</b>	1	0
<b>Labour</b>	2	1
<b>Land</b>	2	0
<b>Time</b>	0	1
<b>Physical capital</b>	0	1
<b>Job Vacancies</b>	1	0
<b>Nothing</b>	5	7
<b>Total</b>	22	27

Figures relate only to where plans were either possible or unlikely. Where plans were highly probable, or already being implemented, it is assumed they were no significant hindrances.

## GENERAL ISSUES AND CONCERNS IN THE COASTAL COMMUNITY

This section looks at the wider environmental and institutional issues around the coastal communities livelihoods concerns outlined previously.

In Table 6.11 we can see clear differences between Tobago and Jamaica in terms of priority concerns. In Jamaica the most important concerns related to livelihoods and security, whereas in Tobago the concerns were more with long-term personal, community and external issues, such as children's education, and changes and ownership in tourism. Comments indicated that matters were more pressing in Jamaica, though in a community context there was considerable concern for unemployment. In Tobago too there were some groups, particularly lower asset groups who had more pressing health concerns (farmers) and security concerns (fishers).

There is no major pattern of issues by livelihood group, though those who were most concerned about maintaining or improving their livelihood were the fishers in Jamaica. These concerns related largely to the uncertain nature of fishing and the difficulty in upgrading that occupation. The results show some difference between men (more concerned with work) and women (greater concern with household and community).

The environment was a secondary concern in Jamaica where coastal dwellers were particularly interested in maintaining a clean environment for tourism and marine park management. In Jamaica household security and livelihoods (market facilities for women) also remained a concern. Personal improvement concerns in Jamaica dealt with getting a house, whereas in Tobago they more about self-fulfilment (e.g. marriage).

**Table 6.11 Important concerns of coastal community (secondary concerns in brackets)**

Increasing severity of concern ←												
Concern	Survival food security	Health	family's and household security	Maintaining or improving livelihood	Community livelihoods and services	environment	external economic threats (prices, markets, etc)	Children's future	personal social improvement	Other	no major concerns	Grand Total
<b>Jamaica</b>												
Female	1		7	1(3*)	5(2)	1	1	2(2)	(3)	1	1	20
Male		1	2	21(6)	1	2(1)		1	(2)			28
Jamaica Total	1	1	9	22(9)	6(2)	3(1)	1	3(2)	(4)	1	1	48
<b>Tobago</b>												
Female		(1)			1			3				4
Male	2	3(1)	3(1)	3(3)	3(6)	(4**)	4	6	3		1	28
Tobago Total	2	3(2)	3(1)	3(3)	5(6)	(4)	4	9	3		1	33
Grand Total	3	4(2)	12(1)	25(12)	11(8)	3(5)	5	12(2)	3(4)	1	2	81

\*Women Jamaica - market facilities important

\*\*Tobago - general environment issues

## 6.4 Relationship to the Environment

**Dependency:** In general there was a clear perception of resource dependence by direct resource users (e.g. marine commercial fishers), as well as indirect dependency and subsistence - see Appendix 2. However there was some differences between Jamaica and Tobago on this.

An important difference was the range of resources on which one occupational group depended. For example the fishers in Tobago felt dependent on water and land more strongly than those in Jamaica, in all likelihood reflecting their greater multi-occupancy of jobs.

In Jamaica there was a greater number who perceived non-dependence, (shop-keepers, vendors, etc). In Tobago these groups identified dependence on household water and use of land. This carried on through to the tourism sector in Jamaica with people in these groups having good perception of indirect uses of the natural resources, reefs and shoreline for attracting tourists.

When considering secondary resource dependency, the people of Tobago were much more inclined to identify environmental issues than those in Jamaica.

**Perceived changes in resources:** Table 6.12 indicates that mostly negative change in the environment is perceived in both countries, though in Jamaica also ‘no change’ was frequently perceived (18/49; Tobago 3/32). Those less dependent on resources perceived less or positive change, possibly indicating lower awareness of the environment. The major changes in Jamaica related to declines in fish catches, and in Tobago mainly to declines in sea water quality, but also fisheries decline.

**Table 6.12 Perception of changes in natural environment**

Country	Direction in resource change	Resource				Grand Total
		fish/marine products	land/forest/water	Littering/pollution	marine quality	
<b>Jamaica</b>	change (small/unspecified)		1			1
	negative	<b>9</b>	5	2	3	19
	positive	1	1			2
Jamaica Total		10	7	2	3	22
<b>Tobago</b>	change (small/unspecified)		1	1		2
	negative	5	6	2	<b>9</b>	22
	positive	2		1		3
Tobago Total		7	7	4	9	27
Grand Total		17	14	6	12	49

**Perceptions of Effects of Resource change:** Table 6.13 indicates the effects that resources changes have had on the interviewees. Overall there seems to be very few positive effects of changes. Fishers in both countries feel both the decline in catches, as well as an increase in fish prices. The perceived severity of the decline seems greater in Jamaica, where pollution is viewed as a problem, and littering is of greater concern in Tobago.

**Table 6.13 Perceptions of how environmental change has affected interviewee**

Country	Occupational group - generic	negatively	Minor negative	Not affected	positively	Grand Total
<b>Jamaica</b>	fisher	8		3		11
	fish processor	1				1
	fisher - ancillary	1	1			2
	Tourboat operator	1				1
	beach/bar	2				2
	Shopkeeper			3		3
	vendor					
	transport			1		1
	formal employment					
	housewife				1	1
	teacher				1	1
	unemployed	1				1
	coal burner			1		1
	farmer					1
<b>Jamaica Total</b>		<b>14</b>	<b>2</b>	<b>9</b>	<b>1</b>	<b>26</b>
<b>Tobago</b>	fisher	2	5	3		10
	fish processor	2				2
	Tourboat operator	1		2		3
	Accommodation - large	1		1		2
	Accommodation - small	1		1		2
	beach/bar			1	2	3
	Shopkeeper	1				1
	vendor		1			1
	unemployed					
farmer	1	2	1		4	
<b>Tobago Total</b>		<b>9</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>28</b>
<b>Grand Total</b>		<b>23</b>	<b>10</b>	<b>18</b>	<b>3</b>	<b>54</b>



**Who or what influences the environment:** A higher proportion of interviewees in Jamaica (65%) felt they had no effect on the environment than in Tobago (40%). Most of these were those who were less dependent on the environment, but also a smaller proportion of fishers in both countries said this. In Tobago interviewees mentioned negative effects they had seen (mostly littering). In both countries interviewees commented on their positive efforts towards keeping the environment clean and protecting it (especially fishers in Jamaica).

A variety of agents driving the largely negative changes in the environment were identified in both countries (Table 6.14.). The difference between Jamaica and Tobago was that in Jamaica it was felt that 'people in general' were affecting the environment, either in terms of pollution or overfishing, while in Tobago it was more of a sense of the government not being active enough on behalf of the environment. In Jamaica developers and big fishing fleets were felt to be having adverse environmental effects, while in Tobago foreign fishing fleets and tourism were more important.

**Table 6.14. Perceptions of interviewees on who is influencing change.**

Country	Agent influencing change					Grand Total
	Advocates	big business	climatic/nature	government	People in community	
Jamaica	2	6	3	2	13	26
Tobago		7	3	7	6	23
Grand Total	2	13	6	9	19	49

**Natural hazard vulnerability:** Table 6.15 indicates that vulnerability is generally very site specific. Examples were given of flooding in Old Harbour Bay and Bushy Park, in Jamaica and of storm damage in Charlotteville, Tobago. Overall, damage was higher in Jamaica, largely to it being within the hurricane belt. Historical damage in Tobago related to Hurricane Flora in the early 1960s. In Jamaica economic livelihood implications were also apparent to fishermen, as storms may either limit fishing periods or destroy gear.

**Table 6.15 How affected by natural hazards**

Location	More severe				Less severe				Grand Total
	storm damage	Livelihood impairment	flooding	Minor flooding	indirectly	historical damage	not much	none	
Bon Accord	1				1		8		10
Buccoo						1	2		3
Speyside						2	10	1	13
Charlotteville	3			1				3	7
<b>Tobago</b>	<b>4</b>			<b>1</b>	<b>1</b>	<b>3</b>	<b>20</b>	<b>4</b>	<b>33</b>
Hellshire		5			1		2	2	10
Bushy Park			2	2	1	1		2	8
Cockpit						2	1	1	4
Old Harbour Bay	1	1	9			1	7		19
Portland Cottage		3	1				1	1	6
<b>Jamaica</b>	<b>1</b>	<b>9</b>	<b>12</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>11</b>	<b>6</b>	<b>47</b>
Grand Total	5	9	12	3	3	7	31	10	80

## Relationship to Formal Institutions

**Recognition of relevant laws and regulations:** There was a higher recognition of relevant livelihood laws and regulations in Tobago (25/33) than in Jamaica (19/45) (Appendix 3). The types of regulations were also more diverse in Tobago, especially of trade related (tourism and safety) standards and licencing, though there was a high recognition of fishery laws (lobster and conch closed season especially) by fishers in Jamaica. Fishers in Tobago perceived regulations more in relation to boat safety.

The perceptions of effective laws related primarily to licensing and standards in Tobago (tourism and export promotion), but there was also mention of the lobster closed season regulations in Jamaica.

**Table 6.16 Perceived effectiveness of different types of laws and regulations**

Count of Effectiveness	Country	Type of law/regulation	Effectiveness			Grand Total
			ineffective	effective	very effective	
<b>Jamaica</b>		Licensing/Standards	3		2	5
		Other				
		Regulation - fisheries	7	3	1	11
Jamaica Total			10	3	3	16
<b>Tobago</b>		Licensing/Standards	3	5	4	12
		Other	1			1
		Regulation - environment	4			4
		Regulation - fisheries	2	2		4
		Rights/access				
Tobago Total			10	7	4	21
Grand Total			20	10	7	37

**Involvement in government decision making:** There was a fairly low direct relationship with government decision making with around 15% involved in Tobago (5/33) and 10% in Jamaica (5/47). There was no pattern among occupational groups in Jamaica, but in Tobago all farmers felt they had been involved.

**Opportunity for influencing change:** Close to half the people interviewed in Jamaica (20/43) felt they had opportunity to influence change in the community (slightly lower in Tobago - 9/33). However more detailed examination of responses indicated that the level at which this could be done was fairly low in Jamaica - by improving their own conditions and so strengthening community, or by voting in a new government. In Tobago, on the other hand, several interviewees saw themselves as interacting through trade organisations or representing key groups in likely government decision making situations. Those involved in tourism felt they had positive involvement, though in general there were many comments of frustration with the Tobago (including Trinidad) government and its policies, several relating to the formation of Speyside Marine Park.

**Capacity building opportunities:** A large proportion of interviewees (50-60%, see Table 6.17) in both countries were not aware of any appropriate livelihood improvement support. In

Jamaica many felt they did not need it - especially the fishers. Where support was most clearly available was to the tourist industry, and comments indicated there that it was found to be generally useful, particularly for training courses. Detailed comments indicated a need for training which was more hands-on, and in the provision of non-training support services such as labour support and information.

**Table 6.17. Type and availability of training by occupational group**

Country	Jamaica			Jamaica Total	Tobago			Tobago Total	Grand Total
	Availability of appropriate training				Availability of appropriate training				
Occupational group - generic	available	Don't need	not known		available	don't need	not known		
fisher	2	9	5	16	4	1	6	11	27
fish processor			1	1			2	2	3
fisher - ancillary	1	1	2	4					4
Tourboat operator					1		2	3	3
Accommodation - large					2			2	2
Accommodation - small					2			2	2
beach/bar		1	4	5	1		3	4	9
Shopkeeper		2	3	5			2	2	7
vendor		2	1	3			1	1	4
transport		2	1	3					3
formal employment	1			1					1
housewife			1	1					1
teacher	2			2					2
unemployed			2	2			2	2	4
coal burner			1	1					1
farmer		1	1	2	1	2	1	4	6
Grand Total	6	18	22	46	11	3	19	33	79

## Field Study Conclusions

Having looked at two similar sized areas on a small island and larger island in the Caribbean we will now summarise the emerging picture.

The overall macroeconomic structures of Jamaica and Tobago are similar in some ways, such as in the shares between agriculture, industry and services, and in population age structures<sup>10</sup>. The similarities cease at this point with Trinidad and Tobago having a gross domestic product *per capita* nearly twice that of Jamaica<sup>11</sup>, growth of 5% (1999) compared to (minus) -2% in Jamaica (1999)<sup>12</sup> and a large gap in prevailing interest rates<sup>13</sup>. There are clear differences in wealth, and other measurements of development such as the human development index<sup>14</sup> and literacy<sup>15</sup> produce a similar picture<sup>16</sup>.

It is important to note that there is significant unrecorded economic activity in both countries – but this is generally thought to be very high in Jamaica and this is not reflected in the official figures presented in the paragraph above.

What needs to be added to the situation at the top level is the impact of the wider macro economy both as an opportunity and a threat. It represents an opportunity in Tobago with strong growth (annual average of around 3.3 % over the last five years). The economic opportunities that this brings and very importantly the financial stability it creates (giving low and stable interest rates) is important for coastal communities. The contraction of the Jamaican economy creates a rather different environment with reduced economic opportunities, financial instability and very high interest rates. These result in reduced opportunity for all.

People are clearly poorer in terms of assets and under more stress in Jamaica than Tobago. This is also reflected in their overall concerns relating to maintaining an income, and in their access to services. As such, the two countries can in some ways represent many of the constraints (primarily Jamaica) and opportunities to change (Tobago) of the Caribbean.

In Tobago there is a continued upward economic trend, with diverse opportunities and services, and variety of assets. Opportunities include better access to financial services, with better finances providing a more solid base for getting credit. In Jamaica there is greater dependence on the informal lending sector and local civil society institutions. Wider sources indicate the importance of the general informal economy there.

It is also clear that the greatest opportunities are likely to occur in tourism in Tobago, though this should not be seen as the sole mechanism for strengthening the local economy. Jobs in government and pensions provide important support and safety nets not visible in the

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<sup>10</sup> Based on figures for Trinidad and Tobago as a whole (CIA, 2000)

<sup>11</sup> Jamaica figure of US\$3300 (CIA Country Factbook) and Trinidad and Tobago at US\$5600 calculated from Bank of Trinidad and Tobago Annual Economic Survey (1999) and CIA Country Factbook.

<sup>12</sup> Jamaican GDP (constant) has been falling for the last 10 years with 1998 figures been nearly 5 per cent below those of 1995 (Statistical Institute of Jamaica, 1999). During the same period GDP (constant) in Trinidad and Tobago grew by 12.9 per cent with provisional figures for 1999 indicating growth of just over 5 per cent.

<sup>13</sup> Market borrowing rates are in the region of 40% in Jamaica. In Trinidad and Tobago these are in range 15-20%.

<sup>14</sup> 0.734 for Jamaica and 0.797 for Trinidad and Tobago.

<sup>15</sup> 85% for Jamaica and 97.9% for Trinidad and Tobago.

<sup>16</sup> There are relatively detailed poverty assessments for both countries. In particular see Tobago Policy Research and Development Institute (1999), Planning Institute of Jamaica (2000) and Planning Institute of Jamaica/Statistical Institute of Jamaica (2000)

communities investigated in Jamaica. Also the tourism sector is not seen only in a positive light in Tobago. It is often viewed with a strong sense of unfairness - that it creates conflicts over access to resources, clients and business. The opportunities for inter-linking with the fisheries and agriculture sectors (in the form of community-tourism) to develop a truly sustainable tourism, remain largely untapped.

In Jamaica activities are more restricted, with fishing forming the core of livelihood links. Ironically (but following laws of supply and demand) in both Tobago and Jamaica declines in catches (more severe in Jamaica) are also accompanied by increased prices with some positive effects<sup>17</sup>. However the severity of the situation is illustrated by a desire for increased catch effort in Jamaica as an economic way forward. In Tobago there is more concern for diversification, which, in an environmental sense, is much more likely to be sustainable. The fragility of the fishing livelihood situation in Jamaica is compounded by the vulnerability to storms faced by fishers.

Overall there seemed to be both a greater awareness among the communities in Tobago about their dependence on the environment (natural capital). This was demonstrated by the as well as wider range of resources individual groups depended on, creating a better setting for future sustainability, and even realising the important links between the health of the environment and tourism. Nevertheless, groups in both Jamaica and Tobago perceive a general decline in resources, more severe in Jamaica, with a variety of sources of influence. Although most adverse influences were seen as external to the coastal communities, the communities themselves, together with large scale development were seen as major threats in Jamaica.

There seemed to be little effectiveness in the implementation of government regulation and support except in the tourism sector, though it is clear that the relationship between the government and the people is much closer in Tobago than in Jamaica. Despite this there are also difficulties in the local politics of Tobago and the role of the Tobago House of Assembly in addressing local needs as opposed to those of the more expensive larger scale tourism sector advocated by Trinidad. There is also some room for optimism in Jamaica, with effective species-specific fishing regulations being developed for lobster, and the involvement of fishers in the discussions of enforcement and protection (CCAM 1999). It is clear that government support will have to become more local and flexible, and that livelihoods responsive to the needs of coastal communities must be examined. A strong positive economic climate is crucial for sustainable livelihood development.

### **Wider implications**

There are several emerging themes for means of moving forward. These are broad development themes which need to be borne in mind even in the more specifically resource management process which is relevant to NRSP LWI.

Issues of scale cannot be easily observed in the results. There does seem to be an element of migration to the opportunities created by access to urban areas, though this does not necessarily solve problems when assets are otherwise low.

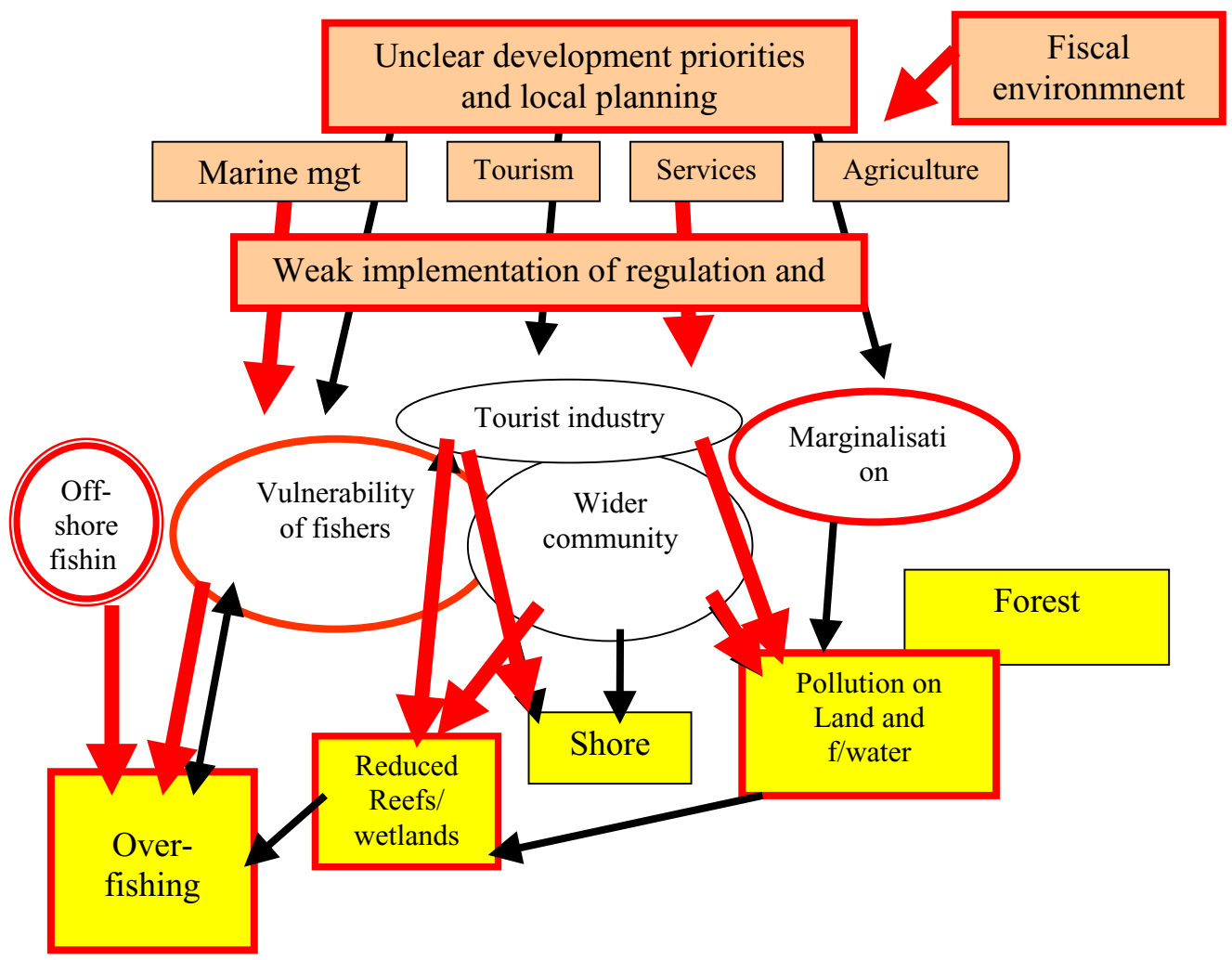
- Macro-economic (fiscal policies, stability, investment) and governance (devolution, accountability and implementation) are important and relatively obvious key factors to the support of sustainable coastal livelihoods and the well-being of coastal communities.

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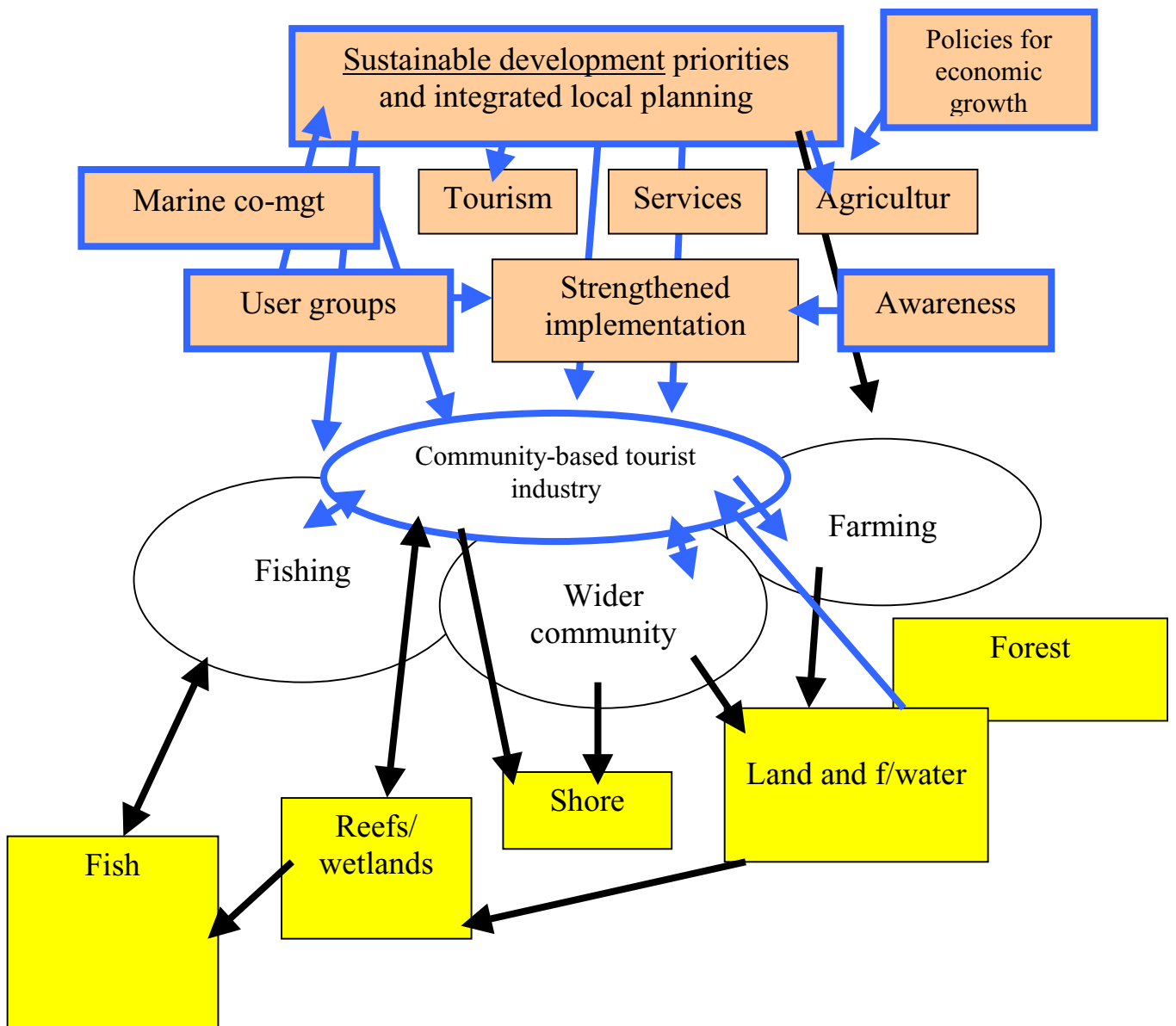
<sup>17</sup> There is no obvious explanation of this contradiction. Fish prices may have increased by more than enough to compensate for falling catches; numbers of fisher folk may also have declined as a result. There are no meaningful official statistics for fisheries alone – but figures in all primary industries (agriculture, fisheries and forestry) have been showing marked declines in employment (Statistical Institute of Jamaica, 1999: 182-207).

- The education system creates awareness at different levels, forms stability of income and also provides opportunities. However education needs to be more issues-driven (for example in relation to present environmental issues) and to be made hands-on and accessible (enterprise and management-related) in order to provide sustained support to livelihoods.
- The wide inter-linkages between different sectors in the coastal communities point to a coastal zone management approach which is very broad and needs to be analysed in a wider development context (linking and integrating land-use, livelihoods development, tourism, local development planning, general resource co-management systems, urban development etc).
- There is a need to identify develop economically viable resource use, and institutional performance mechanisms and indicators for local planning which have real influence on the development of coastal livelihoods. On smaller islands it is likely, where nearly all communities can be classified as 'coastal' that these will be the same local development planning systems. In Jamaica, as a larger island, there may be some room for sectoral planning, though few issues could be considered specifically coastal, and there there is considerable potential for local development planning (ENACT, 1999).

**Figures 6.8 Summary of the emerging constraint faced by coastal livelihoods in Tobago and Jamaica**



**Figures 6.8 Summary of the emerging opportunities for coastal livelihoods in Tobago and Jamaica**





## SECTION 7 : NATIONAL VALIDATION EXERCISES

### Background

An important part of the project was acknowledged to be the validation exercises in Jamaica and Tobago following the community questionnaires and analyses.

There were two parts to the validations. One related to receiving agreement from the coastal communities of Portland Bight and Tobago that the inferences which project personnel had drawn from the questionnaires were a true picture of life in their area. The second related to their views on what could or should be done to help improve their lives or reduce their vulnerability, and the relationships between these suggestions and the regional/national views.

### Methods

The validation exercises were organised by CCAM and ET staff in Jamaica and Tobago respectively, and carried out in early June 2001 by NRI and CCAM staff in Jamaica, and by NRI and ET staff in Tobago. Seven participants attended the Jamaican Validation Workshop, and 34 attended the one in Tobago. The invited participants were community members who had completed the questionnaires plus interested community representatives.

In each case the information obtained from the analysed questionnaires and interviews was displayed as charts and tables, comparing and contrasting results from the two field sites. After presenting, explaining and discussing these results, each group was asked whether the results presented local reality.

The second phase then asked participants to identify the major constraints to improvement of their lifestyles, and the sorts of action required to alleviate these problems. Their responses were ranked and then compared, within the validation meetings, with results provided by the VSG rankings.

Finally the participants were given a demonstration of the database, and the opportunity to question it for information which they might require.

### Results

#### *Jamaica:*

Although only a small number of residents participated in the workshop, they were very interested in the results and fully validated the questionnaire findings (given in detail in Section 6).

When asked to identify the issues of most importance to them, the group produced the ranked table below:

**Ranking of Key Coastal Issues by Jamaican Community  
(5 women, 2 men) Lionel Town, Portland Bight 9/06/01**

1. Family
2. Health
3. Education
4. Crime
5. Credit access
6. Community/infrastructure
7. Environment/pollution/deforestation/natural resources
8. High taxation/high cost of living
9. Illegal squatting
10. Fishing

Following this they were asked to identify possible research projects/interests, and suggested:

**Ranking of Possible Research Interests/Issues  
by Jamaican Community. Lionel Town 9/06/01**

Of those already suggested by VSG:

1. Social effects of smuggling/crime
2. Social and economic implications of increased catching effort by fishing communities:
3. Understanding relationships between food and services for local communities and tourists
4. Comparative regional assessment of what co-management means to different stakeholders

Plus additional needs:

2. Reforestation of coastal slopes
4. Women's craft projects  
(1. Infrastructure improvement)  
(3. Education)  
(5. Better credit access)

(Numbers 1,3 and 5 are included because the group raised them, but as they are development projects, the chances of the NRSP programme being able to assist is very slim).

***Tobago:***

The meeting in Tobago was much better attended than the one in Jamaica and was very vocal. The gender balance of Tobagonian questionnaire respondents (28 male:4 female) was questioned, and despite explanations that women were not the asset owners in Tobago, the meeting (21 male:14 female) was unwilling to fully endorse the findings until more women had been interviewed. They did agree that the findings were very interesting, probably true, and of more value than some other surveys.

In terms of coastal issues of importance, the meeting generated the following table:

**Ranking of Key Coastal Issues by Tobagonian Community  
(14 women, 21 men). Scarborough, Tobago 12/06/01**

1. Lack of environmental education
2. Pollution – solid waste, sewage, household, industrial
3. Alternative livelihoods
4. Impacts of tourism – socio-economic, access, ownership
5. Better enforcement of laws/inadequate legislation
6. Lack of govt/private/community co-ordination
7. Physical development – too many commercial buildings
8. Over-exploitation of living and non-living resources: loss of coastal vegetation, sand mining
9. Coral damage
10. Erosion

The meeting's views on possible research issues which might benefit them were then sought, with the results below:

**Ranking of Possible Research Interests/Issues by Tobagonian Community  
Scarborough, Tobago. 12/06/01**

1. Social and economic benefits of traditional livelihoods versus tourism
2. Sustainable tourism carrying capacities
3. Local options for alternative livelihoods
4. Co-management initiatives
5. Alternative technologies
6. Coastal de-vegetation and the impact of 'sea-blast' on the built environment
7. Resource inventories
8. Internal migration
9. Impacts of sewage pollution
10. Sustainability of crab harvesting

**Discussion of Community Validations**

The small number of participants at the Jamaican validation meeting was disappointing, and may have been caused by CCAM being unable to offer transport (as they often do when working with poorer sectors of the community) because of vehicle problems. Despite the unequal gender balance of questioned community members in Tobago, the feeling of the meeting was that the work was good, but needed some extension before it could be fully approved. Thus, despite these caveats, we believe that the results do validate the findings that Portland Bight is a relatively poor and vulnerable coastal community, whereas Tobago's coastal residents are relatively secure from either financial or environmental vulnerability.

In terms of future assistance, it was apparent that the Portland Bight coastal community members live much closer to hardship and vulnerability than those in Tobago. The coastal issues raised by Jamaican residents reflected needs which were much closer to poverty and immediate family breakdown than those in Tobago, where the workshop participants evidently felt they had time and space to think about the environment rather than the next meal. This is in accordance with the impressions gained from a comparison of the questionnaires, so is, in itself a form of secondary validation.

The issues for future possible research projects raised by the Tobagonian workshop is remarkable in its broad similarity to the issues raised by members of the VSG as being in need of further work (see below).

**Virtual Steering Group Validations**

Early in the project, the Virtual Steering Group (VSG - Section 4) was asked to rank a range of suggestions for potential research projects. These were project areas rather than specific research topics. A series of rankings was thus obtained on the basis of VSG members placing themselves in 'regional', 'national' and 'local' situations, and providing their views of the level of importance of the different issues. The responses were then averaged to produce a composite VSG view of ranked priorities (Table 7.1).

The main feature shown by the differences in rankings is the importance of perspective in deciding what is important. This obviously assumes great importance when considering what project areas should be funded and whom they might be considered to benefit.

**Table 7.1 VSG Ranking of Key Coastal Issues  
(based on regional, national and 'local' views)**

	Regional	National	Local
1. Co-management (empowerment)	8	11	1
2. Vulnerability of population sectors	9	3	2
3. Big hotels vs home stays (community)	11	10	3
4. Enforcement	6	5	4
5. Land & sea pollution	3	4	5
6. Migration & remittances	2	2	6
7. Access and property	12	8	7
8. Tourism vs fisheries conflicts	10	12	8
9. Short term responses to long term issues	4	6	9
10. Carrying capacities	7	7	10
11. Smuggling	5	1	11
12. Large island/small island relationships	1	9	12

## SECTION 8. DISCUSSION OF RESULTS

### Sources of information

During its year of activity, the project has attempted to take information related to coastal livelihoods in the land/water interface from as wide a remit as possible. In summary, the seven sources have been:

1. The views of researchers, development specialists, donors and government and non-governmental institutions both in the Wider Caribbean and in UK;
2. Bibliographical references, abstracts and hard copy papers on coastal livelihoods taken from a series of international reference databases, regional reference databases and the Internet;
3. Indicators and indices drawn from published international databases,
4. Projects taken from international databases, web sites and other documentation;
5. Local aspects of opportunities and constraints captured through observation and questionnaire in two case studies in Jamaica and Tobago;
6. Opinions of local stakeholders' opportunities and constraints through local validation;
7. Opinions of regional stakeholders in opportunities and constraints research from the end of project regional workshop in Barbados.

The coverage of information is not complete, and it is difficult to assess the level of completeness. However, three major elements can be drawn from the work:

1. The study has captured as quickly and efficiently as possible the current status of research into coastal livelihoods in the Wider Caribbean.
2. From the study, the knowledge of what issues are important has been derived from several different aspects:
  1. Scale - at a regional, national and local level;
  2. Theme - what topics have been covered;
  3. Extent - which countries or types of country (large island, small island, continent) have been studied;
  4. Agency - the extent of inputs from academic, NGO, Governmental, development organisation or donor sources;
  5. Time - the changing trends of research and development in the coastal zone.
3. The study has identified the key areas of development needs from which researchable constraints may be derived.

### Priority research issues

As a first step we need to identify the priorities for different coastal development issues which have emerged from regional stakeholders perspectives (VSG members) the field studies (see Table 8.1 for field studies summary. Table 8.2 summarises the findings after validation workshops. By identifying the most important issues at several levels and those most relevant to the LWI, a series of development priorities emerges which can guide us to identify important areas for research. These priorities provide a picture of inter-linked issues, some of which may have cause and effect nature. The priority issues include:

Direct environmental concerns - a persistent issue in the Caribbean coastal zone

- Erosion from watersheds, and pollution (both urban and tourist-related)
- Fisheries catches decline still occurring and worsening in some areas

**Table 8.1 Prioritised issues arising from country field studies (Jamaica and Tobago)**  
 (\*more direct LWI issue) and field work

<b>Jamaica</b>	<b>Tobago</b>
<b>Rank of prioritised key concerns based on stakeholder perceptions</b>	
*1. Maintenance and improvement of livelihoods (especially fishers' business security)  2. Family and household security  *3. Community livelihoods and services (unemployment and market facilities)  4. Children's future  *5. Environmental issues - fisheries decline  6. Personal improvement (roof over-head)  7. Survival and health	1. Children's education - expense  *2. Community livelihoods - access to tourism  *3. External economic threats and wider business concerns (tourism, export markets, development politics)  *4. Maintaining livelihoods - more generally  5. Family security and health (poorer and older groups)  6. Personal self-fulfilment  *7. General environmental health (and establishment of marine park)
<b>Important opportunities and constraints, from field study analysis covering both countries</b>	
<ul style="list-style-type: none"> <li>• *Threat of further over-fishing (especially severe in Jamaica; signs of inshore over-fishing in Tobago)</li> <li>• *Weak enforcement of environmental laws, and regulations in general</li> <li>• *Fishers' insecurity (especially in Jamaica, where few alternatives available)</li> <li>• Conflicts of resource access between tourism, fishers and local users</li> <li>• The need for greater awareness on value of human-environment link for the public</li> <li>• *Weak delivery of services (especially water and sanitation)</li> <li>• Local access to government decision-making and planning</li> <li>• *Limited community access to tourism development planning, but offers much potential in terms of creating sustainable employment opportunities</li> <li>• *Inter-linkages between tourism, fishery and farming sectors need to be developed</li> <li>• *Appropriate capacity building for livelihood development, strong user groups and civil society support</li> <li>• National macro-economic situation, stability, growth, incentives</li> <li>• Access to financial services and safety nets</li> </ul>	

**Table 8.2 Priority coastal concerns arising from research project (lines in grey signify highest priority and LWI relevance)**

<b>Issues</b>	<b>VSG</b>	<b>Jama-ica</b>	<b>Tob-ago</b>	<b>Valid'n J/T</b>	<b>Valid'n Barb.</b>
	S. 4	Table 8.1		S. 7	S. 5D
<b>Direct Environmental concerns</b>					
Land and sea pollution/erosion	yes		yes	yes/high	yes
Fisheries decline/ NR over-exploitation		yes		yes/yes	
Deforestation/				yes/yes	
<b>Livelihood strengthening</b>					
Family concerns		high	high	high/	
Vulnerability of population sectors (e.g fishers)	yes	high	yes	yes	Yes
Access to safety nets		yes			
Crime/ security		yes	yes	yes	
Alternative supplementary/strengthened livelihoods		high	yes	-/yes	High
Big hotels versus homes stays,	yes		high	-/yes	
Development of community tourism		yes			High
Tourism vs fisheries conflicts	yes		yes		
Migration and remittances	yes				
<b>Institutional</b>					
Access and property	yes	yes			yes
Enforcement and implementation of laws and services	yes	yes		yes/yes	yes
Support institution capacity (inter-inst'l linkages and sustainability mechanisms)					yes
Co-management (empowerment), user groups strengthening	yes	yes		- /yes	High
Involvement in local development processes, balancing out large scale development		yes		- /yes	
Capacity building for livelihoods, access to markets credit		yes		yes	yes
Public awareness, environment-people link		yes		-/high	
Understanding carrying capacities (including sustainability indicators)	yes				yes
Integration of sectors in CZM (incl. Small island management systems, watersheds)	yes	yes			High
Community based pollution management					yes
<b>Wider issues</b>					
Smuggling	yes				
National macro-economic situation (pro-poor growth policies)		yes		yes/	yes
Sort-term responses to long term issues	yes				
Large island small island relationships	yes				

Vulnerability of key population sectors is seen as an important issue:

- key groups and areas are prone to natural hazards;
- fishers are facing declining stocks, lack of opportunities, and threats of globalisation.

There is a strong need to strengthen alternative livelihoods for coastal communities at all levels. This can be investigated through:

- effects and opportunities of migration and remittances;
- other alternatives and supplementary livelihood opportunities;
- appropriate capacity building for livelihoods;
- appropriate policies in support of the above.

Developing more pro-poor tourism:- policies in particular for:

- increasing opportunities for wider employment in the tourism sector;
- opportunities for small scale community tourism;
- increasing linkages between tourism, fisheries and agriculture.

The involvement of communities (participation) in co-management and wider empowerment in a wider CZM/development context (i.e. wider than MPAs) is needed, especially through the capacity building of user groups. This could include community-based pollution control mechanisms.

Enforcement and implementation of laws need to be strengthened, recognising there is already a plethora of relevant laws. This may include awareness building around these laws, as well as user involvement.

Several aspects of capacity building of coastal community support institutions are seen as issues. Many relate to understanding and managing carrying capacities of the coastal zone:

- sustainable development indicators, and understanding mechanisms for short-term responses to long term issues;
- generating public awareness in people-environment links;
- forming institutional linkages and sustainability.

Integration of tourism and wider development issues with CZM

- balancing 'fair access' issues between large scale developments (especially tourism) and fisheries and local communities, ensuring economic inclusion;
- making development planning more locally responsive (devolution of power and resources).

## **APPROACHES AND RESEARCHABLE GAPS**

The study has attempted to map the difference between what the regional, national and local stakeholders believe are the important issues and what has been studied in the past. Through this it is hoped that this project has helped to identify future research.

The discussion here is centred on two key concepts. First it discusses the approach to research work in the coastal zone. Then it identifies a few key researchable constraints where there have not been substantial studies in the past and the need is apparent from synthesising the seven sources of investigation above. While the study focuses on those aspects that are directly applicable to the goals of the DFID NRSP, there are many more peripheral issues which could be taken up by other donor funding sources.



## Approaches to research

*A key conclusion from this study is that although most aspects of opportunities and constraints to coastal livelihoods in a natural resource base context have been studied at some time or another there remains deficiencies in the usefulness of these studies for DFID's NRSP goals. A change in emphasis in the approach to the research in the Caribbean would help to realise the NRSP goal. The team have identified six key approaches which it believes would be useful.*

- 1. Holistic approaches to study;*
- 2. People-focused rather than resource or institutional studies;*
- 3. A better understanding of "carrying capacity" and development of tools to plan, monitor and evaluate an area's carrying capacity developed;*
- 4. Social and economic inclusion of coastal communities;*
- 5. More locally sensitive and poverty focused indicators to map and monitor effectiveness of research and development in the Caribbean coastal zone;*
- 6. The development of techniques and research models which are at best, scalable (interchangeable from local to regional) but at least, reflect issues of scale in their conceptualisation.*

### **1. Holistic Approaches.**

One of the major problems identified with the research in coastal livelihoods is that it is either too sectorally or too thematically based. Several references look at coastal zone issues in a traditionally scientific way by isolating the key researchable item. Sectoral study is not necessarily effective as it can ignore the multi-occupational nature of life in the Caribbean coastal zone, as well as the impacts on other livelihoods or resources *in situ*, *downstream*, or in *adjacency*. In multi-disciplinary terms, a geographical perspective can be useful. However, in the published research only the *in situ* geographical analysis is common; downstream has been used in watershed analysis but is less common on the marine side; and few studies look at *adjacent* impacts. Only in studies considering migration has friction of distance been studied, but the well-worn geographical aphorism of "accessibility to good, proximity to bad" could be applied to a range of topics on livelihood opportunities and constraints.

Holistic analysis of research need not necessarily lead to holistic or multidisciplinary project. It means that a holistic approach to the design of the project must be taken, although the project work itself may focus on a single line of intervention.

There are holistic exceptions to this in the Caribbean. It was seen that work in small islands has moved to holistic conceptualisation with local intervention and case study research. Both the OECS promulgating the Island Systems Management (ISM) model and USAID working from 'ridge to reef', are good examples, stressing the interconnectivity of both land and marine systems in the dynamics of the land water interface. Less holistic approaches seem to be taken on large islands and especially on continents. Wider appreciation of holistic linkages may help to develop more thoughtful research interventions than in the past. ISM is not a perfect model. It breaks down conceptually as it sees islands as relatively closed systems. Some references have shown how even remote islands are affected by marine events (salinity changes, migratory fish stocks), atmospheric changes (airborne pollution) and global effects (climate change and sea level rise).

Finally under the holistic banner, the lack of long term thinking is still prevalent within both the research and donor communities. Although some projects are taking a longer view for monitoring purposes and adaptation to future risks (e.g. CPACC), there are few studies that put their research into the context of temporal relevance.

## **2. People-focused rather than resource or institutional studies**

Both the reference search and the priorities of development specialists and academics continue to show concern for management of the coastal zone targeted in two areas. First of all, a comprehensive biological understanding of the nature (form, process and reaction) of the resource under threat has been addressed, and continues to be prioritised by researchers in the field. There are many reasons why this is a valid approach to research and a million gaps in our biological knowledge of Caribbean coastlines still exist. Second, the establishment, redevelopment, reworking, and research about formal institutions fills many pages of documents. Researchers continue to bemoan many factors related to how institutions are formed, who owns and runs them, how corruption may be bringing them down. Development agencies and donors look at establishing new agencies, new ways of creating formal institutions and better governance to answer resource conservation or use issues.

The reference database shows a marked lack of research into experiences at the individual level. It must be acknowledged that more recent research has turned its attention to community management, co-management, the livelihood of fishers, smallholders, plantation workers or local tourism, but it is apparent that the work is still either natural resource or institutionally focused. Consequently few references are person-centred, establishing what resources are available to them (and widening the term of resource to include not only the natural capital, but also financial, physical, social and human) and how development and conservation of these will both improve and sustain their livelihoods. Movements in this direction have occurred in development literature generally in the last 4 years, but there seems to be little in the coastal zone world-wide, and even less in the Wider Caribbean.

A more glaring gap is the work on alternative livelihoods. Development work in this area has focused on macro scale studies (e.g. in migration) or on the stimulus of an alternative to conserve a depleted resource (e.g. fishermen being turned into tourism craft workers). Very few studies appear to have comprehensively reviewed sociology and economics of all potential opportunities to a coastal dweller (including both local and distant opportunities) and those that do tend to show reams of results without detailed analysis of the implications.

## **3. Carrying capacity**

The concept of carrying capacity has been studied in various guises, but there are certain approaches that could improve the effectiveness of research in a development context. It is probably agreed that there should be scientific, verifiable, repeatable and comparable quantitative measures of carrying capacity. These could either cover systems (beaches, coastal zones, MPAs, islands, archipelagos etc.) or could be resource based (e.g. fisheries). Several measures already exist and organisations are co-ordinating these (e.g. CFRAMP for fisheries).

However, the measures created are generally rigid figures based on tightly controlled criteria. There is a need for measures of carrying capacity which are much more in tune with the social and economic climate, and can be placed in the local context in terms of sustainability, conservation and the type of resource being managed. An example of this could be the carrying capacity of a new hotel development on an island. Using environmental indicators alone, a certain carrying capacity can be indicated. An even more useful indicator could be a sliding scale of carrying capacity which would take into account the environmental and community friendly practices the hotel would be using in design, construction and day-to-day running, such as better sewage disposal, laundry practice, local food, service and amenity provision and community involvement.

A wider investigation into the concept and realisation of carrying capacity would be a useful approach and could be vital in linking people with their resources

## **4. Social and economic inclusion**

Much of the research which has been done, and even some development projects for coastal communities still tend to treat people as agents or statistics. However, there has been a growing realisation in more recent work that the people need to be involved from start to finish - in the research design and execution of the project if there is to be a genuine uptake of the results.

The concept of access has been difficult to define and isolate at the regional level during this study, because it means so many different things to so many people - but it is very clear from the local case studies that access to resources is a key developmental need. This access could be to the natural resource (e.g. to the beach), or financial capital (particularly credit or land ownership) or from support services and the information.

It must be acknowledged that much research work has touched on these issues, and that there are key examples from the rest of the world in other research programme areas of studies into understanding the opportunities and constraints in accessing resource. Unfortunately, in methods of opening or increasing that access, there is little evidence of work on increasing access for communities in the land/water interface in the Wider Caribbean.

There are key areas of weakness in the conceptualisation of access. First, the subtleties of people's developmental needs are not well understood or mapped out. For example, in education there is much emphasis on training in technological improvements, but many people in the communities suggested that business management skills would be more useful than technical training. Also in terms of education, the Wider Caribbean generally has excellent primary and secondary facilities, but there are tertiary education needs which cannot be addressed solely by centralised campuses on a limited number of islands.

Second, the research is not keeping up with the range of opportunities and constraints which are emerging. The concept of globalisation has manifested itself strongly in the Caribbean, especially in terms of communications, tourism and agriculture, but the documentation of this has focused on institutions and macro-economics. Some social studies, particularly on the effect of USA culture on the Caribbean, have been written, but other social effects of globalisation at the community and individual level on the coastal zone, and their effects on natural resource management, are not forthcoming.

Third, the use of communities as agents of research and development, as opposed to being just the subject matter, is very limited. There is scope for a greater role for local communities to set the research and development agendas, and to be proactive in ensuring their needs are addressed through both research and development channels. Having access to the communications which will give them pertinent and useful information is a major challenge. Information should be provided in a suitable format and presentation mode.

## **5. More locally sensitive and focused indicators**

The presence and potential for using indicators has been discussed at length in Section 5C. It has already been acknowledged that although some indicators are useful surrogates for condition, more research is needed into identifying better indices that measure changes in four main areas:

- 1. Pressure on resources**
- 2. Establishing poverty levels and sectors of population in the defined category**
- 3. Economic, social and personal vulnerability**
- 4. Available opportunities and measurable constraints to livelihood and development**

It is very important to ensure that the raw data from which these indices are derived are available across the region at a disaggregated scale. The two major drawbacks with the current indicators are that they cannot be applied purely to the coastal zone, and that they cannot be made to focus wholly on the poor. The first drawback limits the effectiveness of monitoring pressure on the natural resource in the land water interface. The second means that the ranking of the Caribbean countries' (usually rural) poor are often obscured by large and inflated rich sectors, often based in urban centres. As a result of this, it can be difficult to convince donors that there are significant numbers of people who live in absolute poverty in the Caribbean, or that those who do achieve reasonable incomes have adequate security from economic and natural risks which may plunge them back below the poverty line. A key challenge of the donor community should be not only to get people out of poverty, but to keep them there. Research, establishment and maintenance of indices which cover the four issues above would assist donors in monitoring trends in sustained poverty eradication.

## **6. Scalability**

This final recommended change in approach to research is to ensure that the context of the scale in which people are working is accounted for properly. All research work in the land/water interface in the Caribbean should be, at best, scalable (interchangeable) at regional, national and local levels, but at least, should be sensitive to what assumptions, concepts and implications the research has at all scales when conceptualising the project. For example: macro-economic studies of globalisation of agricultural development in Caribbean states is vital and current, but the causes and implications at the local level should not be ignored.

## SECTION 9.

# FUTURE RESEARCH FOR COASTAL LIVELIHOODS IN THE CARIBBEAN FOR

## NRSP LWI

### A framework and mechanisms for future research

Taking into account the factors discussed in Section 8, the project can suggest a framework within which research gaps can be placed. Looking at three levels, there are certain types of research that are needed:

- **Regional level monitoring for donors** - for monitoring and evaluation of both the research and the changing development needs in the region. (e.g. indicator studies)
- **National level** - pinpointing where key vulnerable groups are.
- **Local level** - conducting case studies of actual situations

In addition to as research at the regional level, there are certain **support mechanisms** needed to ensure co-ordination, effective targeting of money and to monitor the research and development activity. For the purpose of this project two elements were established:

- A **database** of key references, projects and indicators, attempting to document the pertinence for land water interface research and documenting extent, scale and source, as well as various search mechanisms to allow the data to be used in different ways.
- A **'Virtual' Steering Group** or **"Expert Panel"** which has key personnel from different countries, research backgrounds and specialisms.

While there have been drawbacks with these two tools, they have proved useful in innumerable ways during the project, both in their original conceptualisation and in their applicability for long term sustainability. It is suggested that they may serve as pilot support mechanisms for future projects. A further initiative, which has been set up since the end-of-project workshop in Barbados, is the formation of a Caribbean-wide e-mail group on research issues in the land/water interface.

Groupings and databases already exist in the region, dealing with issues related to land/water interface livelihoods in the Caribbean. Donors and regional stakeholders already have some informal co-ordination (e.g. the OECS donor committee in Barbados), but there is little at the wider regional level. Other databases exist which cover projects, marine protected areas (CEPNET), and references on coastal conservation.

The major question should be: 'Are the tools developed for this project worth sustaining?' An initial response from the Barbados Workshop is that the concepts were good, but a better design integrating what already exists and what would be sustainable in the region, needs to be addressed before they are implemented in full and/or elsewhere.

### Research gaps

Table 9.1 highlights areas of potential research for NRSP LWI as identified through this project. It shows topics that are highly relevant to the needs of the region and its communities (see Section 8); identifies expressed needs for research; and gives an indication of where considerable research is ongoing, with a note on the nature of that coverage. For example it can be seen that for several topics there is already existing NRSP-LWI research, This indicates strong appropriateness in the programme direction, but it should be noted that there

is a tendency for this work to be focused on MPAs and reefs. The participants of Barbados Workshop strongly expressed the need to reach beyond these confines.

Thus to support the improvement in the livelihoods of the coastal communities in the Caribbean, the key researchable areas are the following.

1. Understanding the social and economic effects of increased catch efforts in fishing communities and vulnerability faced due to globalisation and other external pressures (including security conditions).
2. Identifying opportunities for alternative and supplementary livelihoods in coastal communities through:
  - increasing linkages between tourism and fisheries and agriculture;
  - other alternatives and supplementary livelihood opportunities;
  - appropriate capacity building for livelihoods;
  - appropriate policies in support of the above.
3. Understanding the processes for co-management (non-MPA) and wider empowerment, particularly through identifying:
  - strategies for capacity building of user groups;
  - community-based pollution control mechanisms/appropriate technologies;
  - what affects enforcement and implementation of laws and management, including processes for self-enforcement.
4. Identifying processes for strengthening institutional linkages and sustainability of support institutions in support of the above.
5. Carrying capacity definitions and policy implementation:
  - particularly in defining what the terms mean and how, with improved techniques carrying capacities for e.g. tourism, urbanisation or fisheries could be maximised, and ensuring that different socio-economic contexts are taken into account;
  - how to use the above to generating public awareness in people-environment link (particularly local livelihoods), and so strengthen the process of decision making strategies.
6. Process of strengthening access issues between larger scale development (especially tourism) and fishers and local communities livelihoods ensuring economic inclusion, and reducing conflict:
  - through examining through linkages between CZM and wider development planning processes; and
  - links with locally responsive development planning .

**Table 9.1 Research gaps and needs identified from various sources of the project, in relation to priority regional coastal livelihoods issues**

- (1. Database review (see Table 5.1)
- (2. Validation from community meetings in Jamaica and Tobago (as an indication of interest in key information)
- (3. Past or ongoing NRSP-LWI research.
- (4. Identification of existing research activities known to Barbados regional NRSP-LWI workshop participants)

**Key:** X, XX = existing research; √ = expressed need; (subject covered)

**Grey rows:** Greatest need, least research coverage

<i>Priority development issue</i>	<i>Research gap/need identified</i>			
	1. Review	2. J/T Valid'n	3. NRSP-LWI	4. Barb. W/S
<b>Direct environment concerns :</b>				
• Erosion from watersheds, and pollution (both urban and tourist related)	XX	√√(reforestation)	R7111 R7668	XX
• Fisheries decline still happening and is imminent in some areas	XX			
<b>Vulnerability of key population sectors :</b>				
• Key groups and areas are prone and resilient to natural hazards	XX			XX
• Fishers are facing increasing resource decline, and at the same time lack of opportunities, facing globalisation	√	√		
<b>Alternative livelihoods for coastal communities:</b>				
• Effects and opportunities of migration and remittances	XX √(effects)	√		XX
• Other alternatives and supplementary livelihood opportunities		√√	R7559 (reefs)	
• Appropriate capacity building for livelihoods				
• Appropriate policies in support of the above				
<b>Developing more pro-poor tourism - policies:</b>	X (ecotourism.)			X
• Increasing opportunities for wider employment in the tourist sector, opportunities for small scale community tourism	X	√√		XX
• Increasing linkages between tourism and fisheries and agriculture		√	R6783 (MPA)	√
<b>Co-management and wider empowerment</b>				XX
• Capacity building of user groups		√√	R7559 (reefs)	√
• Community-based pollution control mechanisms/appropriate technologies.	X (erosion, fisheries)	√		√
<b>Enforcement and implementation of laws (self-enforcement)</b>	X (general)			
<b>Capacity building of coastal community support institutions</b>				XX
• understanding carrying capacities	X, √(soc-eco)	√	R6919 (MPA)	XX
• sustainable development indicators,		√		XX
• generating public awareness in people-environment link. Decision making strategies		√	R6919 (MPA)	X
• Forming institutional linkages and sustainability			R7976 (MPA)	X
<b>Integration of tourism and wider development issues with CZM</b>	XX (tourism, NR protection)			
• Access issues between larger scale development (especially tourism) and fishers and local communities livelihoods, locally responsive development planning (economic inclusion)	(X)		R6783 (MPA) R7976 (MPA)	X