# Building consensus amongst stakeholders for management of natural resources at the Land Water Interface

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**Building consensus amongst stakeholders for management of natural resources at the Land Water Interface**

Although methods to increase participation by different stakeholders in natural resource management have been developed in different contexts, in many cases they are not successfully adopted and institutionalised within the operating procedures of resource management organisations. This project builds on the work undertaken in 1997-1999 through the DFID NRSP project R6919, 'Evaluating Trade-Offs Between Users of Marine Protected Areas in the Caribbean'. That research developed a participatory decision-support tool, termed 'trade-off analysis' which brought together stakeholder analysis, multi-criteria analysis and consensus building techniques. Trade-off analysis is a useful decision-support tool that has the potential to engage stakeholders in the decision-making process for coastal resources. This research examines what are the opportunities and constraints to institutionalising participatory approaches to natural resource management such as trade-off analysis.

There was strong support for this research within Trinidad and Tobago. Several resource management agencies, such as the Institute of Marine Affairs and the Environmental Management Authority in Trinidad have acknowledged that institutional constraints to participatory approaches require research. There was also a clear demand for a practical manual to guide the application of trade-off analysis and for more information generally on the approach. These needs guided the two main aims of the project, namely, to understand the opportunities and constraints to institutionalising participatory approaches to natural resource decision-making, and to disseminate information on techniques for incorporating participation and consensus building in decision-making.

The research programme involved identifying local level and informal institutions and new institutional mechanisms necessary for implementing 'trade-off analysis' in Trinidad and Tobago through a series of interviews and a workshop on the role of trade-off analysis in Trinidad and Tobago. The research team participated in a second workshop to promote Trade-off Analysis and other consensus building techniques applied to coastal resources in the region. A manual detailing the trade-off analysis approach developed in project R6919 was produced and disseminated regionally. In addition, the capacity building needs of regional and local institutions were examined, and the potential for developing a co-management strategy with local stakeholders was explored through facilitating meetings of the Buccoo Reef Stakeholder Group.

A hierarchy of pre-requisites for participatory natural resource management was developed for resource management in Trinidad and Tobago. The importance of specific individuals within the decision-making process for resource management is apparent in Trinidad and Tobago. This highlights that institutional investigations that only explore structural and regulatory change are not adequate to explain institutional uptake of participatory approaches. It appears from the research undertaken that 'successful' resource management in Trinidad and Tobago requires consideration of a spectrum of issues from governance to the self-esteem needs of individuals.

In addition, a new framework was developed to understand the nature of the actors and networks involved in determining institutional conditions for natural resource management at three institutional scales. Resource managers whose networks are limited can find that their ability to manage the resource becomes severely constrained, as is the case for Buccoo Reef Marine Park. In relation to natural resource management in Trinidad and Tobago, analysis of the existing networks suggests that there are many areas within existing

institutions that require strengthening. In particular, networks of dependence and exchange at different scales need to be fully explored and mapped.

The trade-off analysis methodology was widely disseminated during the project, at international conferences, at resource management workshops, and directly to marine park managers through the dissemination of nearly 300 manuals on trade-off analysis. The trade-off analysis approach is currently being applied to a watershed management research project in Arrow Forest, British Columbia, Canada. Other resource managers in the Caribbean have expressed interest in replicating the approach.

The Tobago House of Assembly is aware of the constraints to participatory resource management and has been investigating, in collaboration with UEA, the institutional and regulatory constraints to participation. In addition, the Tobago House of Assembly has been investigating the co-management approaches to natural resources applied in other Caribbean islands. This information is being compiled in order to advise the Tobago House of Assembly on possible alternative institutional arrangements for managing marine parks in Tobago. These alternative institutional arrangements are likely to involve some element of co-management or community-based resource management. In terms of developing improved resource use strategies for the coastal zone, the Tobago House of Assembly, through the Department of Marine Resources and Fisheries has indicated that it will use participatory approaches in its coastal resource management planning.

In conclusion, it is clear that trade-off analysis is appropriate for application to wider natural resource management issues. Trade-off analysis does not have to be applied as an entire package but elements within it may be appropriate for different resource management situations. Institutions can constrain their ability to implement participatory approaches by restricting their spaces of exchange and dependence. Knowledge exists within institutions to determine the opportunities and constraints to participatory resource management. This knowledge can be extracted by considering the institution at different scales. Preconditions for participatory resource management can be usefully evaluated at the different scales. For the resource management issues at Buccoo Reef, these scales are: community level, institutional structure, and legal and regulatory setting. Furthermore, individual actors can play a central role in determining spaces of exchange and dependence. Developing participatory methods cannot guarantee that they will be successfully adopted without a clear understanding of these institutional dimensions.

## 2. Background

The present project has sought to identify institutional constraints and barriers to the uptake of participatory natural resource management (including that proposed under trade-off analysis) within Trinidad and Tobago and more broadly within the Caribbean region. This research builds on the work undertaken in 1997-1999 through the DFID NRSP project R6919 (Brown et al, 1999). That research developed a participatory decision-support tool, termed 'trade-off analysis' which involved stakeholders analysis, multi-criteria analysis and consensus building techniques to bring together diverse and sometimes conflicting stakeholders to resolve their resource-use conflicts and find consensus on management strategies and development options (Adger et al, 2000).

Trade-off analysis was shown in project R6919 to be a useful decision-support tool, which has the potential to engage stakeholders in the decision-making process for coastal resources. Trade-off analysis involves four main activities: generating future scenarios of future development options in consultation with stakeholders, defining key management criteria by which the scenarios are judged, quantifying the impacts of the scenarios on the criteria, and then deriving weights from each stakeholder group and using the model as the basis for stakeholder participation in decision making.

Application of the trade-off analysis method to the Buccoo Reef Case Study provided an application of 'bottom-up' modelling in a developing country, and it showed that it is possible to effectively incorporate quantitative and qualitative indicators within multi-criteria analysis, supporting the argument that it is not necessary to reduce all measures to monetary measures. By incorporating a wide range of stakeholders, the approach also showed that it is possible to integrate participatory approaches into technical decision-support tools. The trade-off analysis method, findings, outputs and lessons learned are described in detail in Brown et al (1999).

This research examines the factors affecting the application of approaches such as trade-off analysis and the implementation of participatory decision-making for natural resource management, and identifies the opportunities and constraints to institutionalising participatory approaches to natural resources.

Natural resources have traditionally been managed by the top-down allocation of property rights, and the creation of exclusive reserves for specific activities where the activity is excludable[1]. Such top-down management strategies have been criticised for ignoring alternative institutional arrangements, such as co-management or collective action, that could be created to facilitate management (Berkes et al., 1989). In addition, Moe (1990:213) argues that such top-down policies make institutions 'weapons of coercion and redistribution', and result in certain actors ('political losers') absorbing the costs of conservation.

[1] Marine protected areas in many parts of the globe have been created as exclusive areas, although these are frequently protected in name only as the reality of enforcement is politically unpopular. This phenomenon of ineffective 'paper parks' has been widely reported, for example Ticco (1995).

Empirical research on participatory approaches to natural resource management has found it is possible to identify pre-conditions for the successful[2] application of participatory approaches, such as co-management and collective action. Olson (1965) described collective action as the co-ordination of efforts among groups of individuals to achieve a common goal, when individual self-interest would be inadequate to achieve the desired outcome.

It is now well recognised that understanding the institutional arrangements surrounding the utilisation of common property resources by stakeholders is critical to designing better management of regulated common property resources (Berkes and Folke, 1998; Gezon, 1997; and Imperial, 1999). Debate remains unresolved over what constitutes an institution and how to analyse successes and failures of those institutions.

Analysis of social institutions most often focuses on the rules and contractual arrangements; consideration of norms of behaviour has received less academic interest from common-property researchers (Nabli and Nugent, 1989). There are exceptions, such as Uphoff, who has considered the behavioural norms within institutions. Uphoff (1986) focuses on behavioural issues in defining the nature of institutions. He notes that institutions are 'complexes of norms of behaviour that persist over time by serving collectively valued purposes' (Uphoff, 1986: 9).

Extensive work has been undertaken to assess the impact of individual and collective behaviour on the 'success' of private sector organisations (Hampden-Turner, 1990). Brown (1998) suggests that at an individual level, cognitive limitations, such as selective perceptions are important barriers to organisational learning and change (for a review of organisational culture management, see Hassard and Sharifi, 1989). At the collective level, political and cultural influences can have the most profound retarding effects on organisational change. Therefore, understanding how individual and collective behaviour is influenced and can influence management is central to developing relevant and useful participatory approaches for natural resource management.

There was strong support for additional research to identify the institutional opportunities and constraints to participatory approaches within both government agencies and NGOs in Trinidad and Tobago. Several agencies, such as the Institute of Marine Affairs and the Environmental Management Authority in Trinidad who have indicated an interest in applying trade-off analysis to resource management issues, have acknowledged that institutional constraints to participatory approaches require research. There was also demand for a practical manual to guide the application of trade-off analysis and for more information generally on the approach.

[2] Success, herein refers to the success of the process in engaging stakeholders; it does not refer to the success or sustainability of the outcome of the decision.

## 3. Project Purpose

There are two main aims of the project. First, to improve the resource-use strategies in coastal zones, through understanding the opportunities and constraints to institutionalising participatory approaches to natural resource decision-making. Second, to disseminate information on techniques for incorporating participation and consensus building in decision-making.

The activities proposed to achieve these aims contribute to promotion of more sustainable management through identification of the institutional constraints to implementation and increased uptake and application of participatory methods. Greater application of participatory decision-making for coastal zone management could lead to improved livelihoods through reduced resource degradation of coral reefs and the associated ecosystem components. Management improvements could also occur through more effective enforcement of regulations and an enhanced sense of ownership of the coastal zone resource by local users and communities.

## 4. Outputs

### *Interviews with resource managers in Trinidad and Tobago and the Caribbean region*

A series of semi-structured interviews were completed in Trinidad and Tobago in October and November 1999 and a workshop with diverse stakeholders in resource management in Trinidad and Tobago was held in November 1999. The objective of the interviews was to identify the opportunities and constraints to the institutionalisation of participatory approaches to natural resource management. For a schedule of interviews in Trinidad and Tobago see Table 1.

Resource management professionals engaged in land-water interface management issues were targeted specifically. Interviews involved an open discussion of a number of issues, namely:

1. Identifying which projects the individual was currently working on that engaged stakeholders, or that was located at the land-water interface.
2. The regulatory and legal framework in which the individual works.
3. The individuals perception of public participation as a tool.
4. The ability of the organisation in which the individual worked to implement participatory approaches.
5. Their perceptions of the success of participatory and inclusive approaches implemented by the organisation.
6. Availability of resources (human and financial) to implement participatory approaches in their area.
7. The level of experience and training of those working on participatory approaches, in their office or Department.
8. Specific constraints to implementation of participatory resource management.
9. How institutions determine best practice for participation, when it is applied.
10. The potential for their institution to move from consultation towards participation.

These issues were taken forward during a one-day workshop on the potential role of trade-off analysis in natural resource management in Trinidad and Tobago by focussing on the experience of institutions in Tobago in enhancing community participation in resource areas over the previous three years (see Brown et al, 2000); a copy of the report is appended as Annex A. Participants at the workshop included private, public and non-governmental institutions. The applicability and adaptability of the 'trade-off analysis' process in Trinidad and Tobago was explored during the interviews with staff members within the institutions involved in resource management in Trinidad and Tobago.

**Table 1 Schedule of interviews in Trinidad and Tobago, October-November 1999**

| Organisation | Type of organisation | Department or office | Position (name) |
|---|---|---|---|
| Tobago House of Assembly | Local government | Policy Research & Development Institute | Business Analyst (Mr Rennie Dumas) |
| Tobago House of Assembly | Local government | Policy Research & Development Institute | Resource Economist (Mr Willian Benjamin) |
| Tobago House of Assembly | Local government | Department of the Environment | Manager (Ms Gillian John) |
| Tobago House of Assembly | Local government | Department of Marine Resources and Fisheries | Manager (Dr Arthur Potts) |
| Tobago House of Assembly | Local government | Division of Health and Social Services | Honourable Secretary (Ms Judy Bobb) |
| Tobago House of Assembly | Local government | Division of Employment, Co-operatives & Education | Honourable Secretary (Mr Max James) |
| Environment TOBAGO | NGO | | Manager (Mr Kamau Akili) |
| Government of Trinidad & Tobago | Central government | National Parks Office | Assistant Parks officer (Ms Marissa Clarke-Marshall) |
| Government of Trinidad & Tobago | Central government (local office) | Tourism and Industrial Development Company (TIDCO) Tobago | Manager (Ms Sandra Hendrickson) |
| Government of Trinidad & Tobago | Central government | Tourism and Industrial Development Company | Manager (Dr Carla Noel) |
| Government of Trinidad & Tobago | Central government | Town & Country Planning | Manager (Ms Carol Smart) |
| Government of Trinidad & Tobago | Central government | Forestry Department | Forestry Officer (Mr Barry Mahabir) |
| Government of Trinidad & Tobago | Central government | Wildlife Division | Manager (Ms Robyn Crosse) |
| Government of Trinidad & Tobago | Research & policy | Environmental Management Authority | Director (Dr Mackintosh) |
| Government of Trinidad & Tobago | Research & policy | Environmental Management Authority | Manager Information & Communication Services (Ms Joan Ferreira) |
| Government of Trinidad & Tobago | Research & policy | Environmental Management Authority | Manager Technical Services (Mr Wayne Rajkumar) |
| Government of Trinidad & Tobago | Research & consultancy | Institute of Marine Affairs | Director (Ms Hazel McShine) |
| University of the West Indies | Research | Zoology Department | Head (Professor Peter Bacon) |

Some degree of stakeholder participation in environmental resource management already takes place in some organisations in Trinidad and Tobago. In addition, there are several environmental NGO's that are actively promoting more participation in environmental management, and the development of more appropriate legislation to permit participatory approaches. Several institutions, including the Institute of Marine Affairs, and the Tobago House of Assembly have indicated a desire to apply the process to other resource management problems.

### *Institutional networks as determinants of successful participatory natural resource management*

To understand the structure and behaviour of coastal zone management institutions in Trinidad and Tobago, institutions were considered in terms of three institutional scales, derived from the insights of new institutional economics and common property theories (for example, Firmin Sellers, 1995, North, 1981, and Imperial, 1999):

1. External factors and the policy, legal and regulatory scale (constitutional order);
2. The institutional and structural scale (institutional arrangements);
3. community level (cultural endowments).

Information generated from the series of interviews with resource managers in Trinidad and Tobago, and from the workshop held in Tobago in October 1999 (for a report of the workshop see Annex A) describes the specific influences in Trinidad and Tobago that are affecting natural resource management. Table 2 reports the main issues identified by workshop participants as affecting the development of a participatory approach to natural resource management in Trinidad and Tobago.

Once the major issues affecting the institutionalisation of participatory approaches to resource management were identified, the gaps in structures, rules and behaviours were considered. It was hypothesised that the gaps might reveal the need for an improved institutional design, either through the creation of new institutions or the modification of existing institutions. As Firmin-Sellers (1995: 204) notes: 'The question of institutional design is of profound importance. Institutional design determines whether institutions function to promote socially productive ends, benefiting all members of society; or whether they function to promote re-distributive ends; benefiting a narrow segment of society, often at the expense of all others'.

**Table 2 Perceptions of issues affecting the development of a participatory approach to natural resource management in Trinidad and Tobago at three scales.**

| Area | Issues |
|---|---|
| Legal/regulatory | Existing legislation. External policy influences. Unclear roles of Government Departments and Ministries. Legal liability of resource managers. Level of law enforcement. Legal support for managers. Lack of co-management legislation. Unclear property rights. Legal protection for volunteers. |
| Structural | Level of staff skill. Number of trained staff. Lack of previous successful examples. Credibility of the implementing agency. Hidden political agendas. Possible power loss by government agencies. (Dis)empowered staff. Local vs central Govt. Information hoarding. Project time tabling. Project cycle. |
| Community | Representativeness. Level of communication. Potential downsides to participation. Resource intensive process. Stakeholder engagement guidelines. Intra-community relations. |

Source: Interviews with government, non-government and other stakeholders, Trinidad and Tobago, October-November 1999 (Adger et al. 1999).

The information generated from the interviews and the workshop was analysed in two ways, firstly in terms of the rules, structures and behavioural norms within each of the institutions (see Annex B), and then in terms of institutional scale, and the importance of the institutional networks of dependence and engagement (see Annex C).

The first method of analysing the data collected explored the overlap between rules, organisational behaviour, and individuals' motivations in determining pre-conditions for participatory resource management. The rules, structures and behavioural norms found in institutions in Trinidad and Tobago were framed within a hierarchy of pre-requisites for participatory natural resource management. The framework structures the pre-conditions for participatory resource management, thereby facilitating identification of the regulatory, structural and behavioural gaps that require consideration in participatory resource management. The gaps that exist in Trinidad and Tobago suggest that satisfaction of just the lower level pre-conditions, such as enabling legislation and organisational capacity to manage and police the resource are not adequate to ensure successful participatory resource management. These features are without doubt important pre-requisites, but are not sufficient. The research suggests that issues of governance and citizenship also need to be considered and tackled.

The importance of specific individuals within the decision-making process for resource management is apparent in Trinidad and Tobago. This further highlights that institutional investigations that only explore structural and regulatory change are not adequate to explain institutional uptake of participatory approaches. It appears from the research undertaken that 'successful' resource management in Trinidad and Tobago requires consideration of a spectrum of issues from governance to the self esteem needs of individuals. The framework of institutional pre-requisites was presented in a paper at the Development Studies Association Environment, Resources and Sustainable Development study group conference in May 2000 (see Annex B).

In addition, the data were analysed in terms of a new framework to understand the nature of the actors and networks involved in determining institutional conditions for natural resource management. The networks explored exist at the local, national and international or external policy level. These networks can be described as: *spaces of dependence* – which define the networks that enable individuals to realise their interests through social interaction, and *spaces of exchange* – which are networks created by institutions to enable them to continue to operate or expand their influence. It is growth in the latter that facilitates social learning and increases the potential for institutional uptake of participatory approaches.

Resource managers whose spaces of dependence and exchange are limited can find that their ability to manage the resource becomes severely constrained, as is the case for Buccoo Reef Marine Park. Extending the spaces of dependence to include an active external stakeholder group can facilitate management possibly through a co-management arrangement. One implication of shared management arrangements is that a shift in the balance of power towards the stakeholders would occur. Such a loss of central government power may discourage those in control of power from enabling any change to the existing institutional structure.

In relation to natural resource management in Trinidad and Tobago, analysis of the existing networks suggests that there are many areas within existing institutions that require strengthening. In particular, networks of dependence and exchange at different scales need to be fully explored and mapped. Without an understanding of where the power lies and with whom it may not be possible to assign management responsibility to the appropriate individuals or groups. This paper has been submitted to the journal Environment and Planning A (see Annex C).

The significant institutional barriers currently in place in Tobago to such co-management arrangements are common to state-centred protected area management. At the constitutional level, for example, the relevant legislation courses obfuscation and ambiguity over the roles of the government agencies and departments. As a result the relevant agencies do not have the authority or social sanction to distribute new rights to the stakeholder groups.

Developing a longer term commitment to participatory approaches is an issue of governance; how much power the decision-makers are willing to give up and to whom they are willing to give those powers is an important consideration. Given the nature

of these governance issues they would have to be considered at the highest levels of policy making to have an impact.

### *Development of the Buccoo Reef Stakeholder Group*

The potential for the Buccoo Reef Marine Park to be managed through a co-management system has been explored through the on-going Buccoo Reef stakeholder meetings. Initiated under project R6919, as a product of two consensus-building workshops, the Buccoo Reef stakeholder group comprises the primary stakeholders affected by interventions at Buccoo Reef Marine Park. For more information on the proceedings of the first consensus building workshop see Adger et al (1999). The Buccoo Reef stakeholder group has been meeting monthly since the consensus building workshop in March 1999 to discuss the potential for and the implementation of co-management options.

The UEA/THA research team has provided on-going support to the Buccoo Reef stakeholder group from November 1999 to August 2000, through co-ordination of meetings, to facilitate the development and independent running of the group. The first Buccoo Reef Stakeholder Group meeting under project R7408 was held in November 1999. Meetings were held once a month thereafter during the project. A summary of the proceedings of the monthly meetings can be found in Annex D.

The group has now adopted a formal name: 'Buccoo Reef Action Group' (BRAG), and has developed a mission statement: *"Buccoo Reef Action Group seeks to preserve and conserve the Buccoo Reef through co-management, while educating the public about the reef, its ecosystem, and its watershed."* An e-mail account for BRAG has been established (mail to: savebuccoo@hotmail.com), and the group is planning to develop a web page.

Highlights of the group's activities include the production and publication (in the media) of a letter to the Secretary for Agriculture, Land, and Marketing, Tobago House of Assembly, that identified four management issues requiring urgent action by the THA and the local communities. The issues are: oil and gas pollution in the lagoon; direct physical damage to the reef (reef walking and anchoring); inadequate waste water treatment; and limited knowledge and awareness about the environment in Tobago. The letter was sent to four national newspapers that either published the letter verbatim, or commented on the letter in an article (The Trinidad Guardian newspaper on the 7th and 8th February 2000).

The BRAG has identified four projects that it is working on in collaboration with the Department of Marine Resources and Fisheries, THA (see Box 1). External funding is required for several of these projects, and this is being sought from a variety of Trinidad-based or Tobago-based companies.

**Box 1 Projects planned by the Bucoo Reef Action Group (BRAG )**

1. placing mooring buoys within the marine park.
2. Stopping or phasing out reef walking and a questionnaire for the Reef Tour Operators.
3. Creating and mounting signs which note the legislation concerning what can and can not be done in the marine park, and remind users not to litter.
4. Developing and implementing a Reef Education Programme, starting with the creation of brochures. Information in the brochures will include:
    - an overview of coral biology
    - an overview of the coral reef ecosystem
    - an overview of the types of coral reefs
    - information on BRAG
    - an introduction to BRMP, marine parks, marine protected areas in general
    - an overview of the natural and human impacts on Buccoo Reef Marine Park
    - what is being done to protect/ preserve the reef and what individuals can do to protect the reef
    - legislation and regulations for BRMP.

Technical assistance for the projects and educational programmes that BRAG members want to undertake has been offered as part of the support provided by the UEA/THA researchers. The research team has been withdrawing from active participation in the BRAG, and the group is increasingly taking responsibility for arranging the meetings and undertaking activities themselves. The project team is working towards complete removal of themselves from the preparation and running of BRAG meetings and activities. Although the continued participation of the THA, through the Department of Marine Resources and Fisheries (as a key stakeholder), is a critical element in the success of the group. Without the support of the THA, BRAG will lose their access to the decision making process and their network of exchange will be reduced.

***Disseminating experience and lessons learned from applying trade-off analysis to Buccoo Reef Marine Park, Tobago***

A paper was presented at the 9th International Coral Reef Symposium to an audience of marine park managers, coastal zone scientists, coral reef scientists and researchers. More than 1500 people attended the conference. The paper, which is appended as Annex E, provides an overview of the trade-off analysis process and investigates the lessons learned for management. The focus of the paper is on practical considerations for applying participatory approaches. Four main issues are considered: complex knowledge dissemination, consensus building methods, empowerment and trust building techniques (see Table 3).

**Table 3 Use of diverse participatory tools during the trade-off analysis process**

| Participatory tools | Point of implementation |
|---|---|
| Knowledge dissemination | Stakeholder analysis, Multi-criteria analysis |
| Trust building | Stakeholder analysis, Consensus building |
| Inclusivity | Stakeholder analysis, Consensus building |
| Feedback loops and learning mechanisms | Stakeholder analysis, Multi-criteria analysis, Consensus building |
| Empowerment | Stakeholder analysis, Multi-criteria analysis, Consensus building |

The paper presented to the International Coral Reef Symposium highlights two key factors that drive the process of consensus building, namely trust building and having an open and inclusive process. Early inclusion of stakeholders requires information dissemination to alert stakeholders to the process, and active recruitment and mobilisation by the research team. This process can be facilitated by holding public meetings, sending out news-sheets, or running informal discussion groups. One of the central elements in getting stakeholders on board, and maintaining their interest can be through sharing information.

Once engaged, stakeholders require feedback on the development of the process and their input into it. Providing a feedback loop can facilitate the learning process of the stakeholders, but it is also empowering for the stakeholders to know that their 'local' knowledge is a valid input into the decision-making process. This knowledge builds confidence in the process, and in the stakeholders' ability to participate. Knowledge dissemination is a crucial element within participatory processes as it facilitates stakeholder and decision-maker learning and understanding of the scientific aspects and the process. Sharing information can open the doors to participatory approaches.

Building trust is important, not just in the process, but also in the people who are applying the method. Trust can form the ground-rules for fair play in participatory processes. By showing stakeholder groups how other stakeholders' interests are affected by changes, mistrust between stakeholder groups can be reduced. In addition, because there will be winners and losers in any process, it is important that all stakeholders and participants have trust in the process itself, so that, even if they become the losers, they are willing to support the decision.

Time spent explaining the process and its objectives in a clear understandable fashion is a valuable part of any participatory process, as is ensuring that participants engaged

in the process are clear about the benefits and limitations of the approach. This is particularly important so that false expectations are not developed. Honesty and integrity are essential qualities for people managing this process. By treating all stakeholders with equal respect, and being open and straightforward with them can maximise the potential benefits of co-operation. These results presented at the International Coral Reef Symposium were well received by the marine park management community, and supported research findings from other parts of the world.

***Dissemination and uptake of trade-off analysis approach in other areas***

Trade-off analysis is currently being applied to a watershed management research project in Arrow Forest, British Columbia, Canada. The University of British Columbia (UBC), through the Forest Resources Management and Landscape Architecture School and Forest Renewal B.C. (a government funded organisation) are in the initial stages of applying it to determine an accepted management plan.

The approach has also been discussed with NRSP projects in Kenya and Bangladesh. A new research project, funded by ESRC/NERC/EPSCR through the Tyndall Centre for Climate Change with the current project leaders as principle investigators will further develop 'stakeholder led multi-criteria analysis' in the context of sustainable forest management and as a means of providing policy advice for investments under the Clean Development Mechanism. Requests for copies of the manual (see below) also indicates an interest to adopt trade-off analysis for resource management in other regions.

***Collaboration with CANARI to disseminate the trade-off analysis approach at the CANARI Workshop on participatory approaches to resource management***

Through initial contact with Dick Beales of DFID Caribbean, and a visit to St Lucia, the project assisted with planning for a training workshop on participatory methods targeted at resource managers within the region. The Caribbean Natural Resources Institute (CANARI) organised the workshop, held in Tobago for regional senior resource managers on 'Participatory Management Approaches for Managers and Decision Makers' from January 22$^{nd}$ to January 26$^{th}$ 2001. This was the second week of a two-week programme. The focus of the workshop was 'Designing Participatory Institutions for Effective Management'.

A team from UEA and the THA jointly presented the trade-off analysis process to workshop participants and engaged the participants in applying aspects of the process to four case studies identified by the participants. Feedback from the participants indicated that trade-off analysis may be an appropriate tool for resource management in different resource settings.

***Dissemination of the manual on participatory decision-making for coastal zone management***

Three hundred manuals, and thirty CD-ROM disk copies of a manual 'Trade-off Analysis for Participatory Coastal Zone Decision Making' have been produced (see Annex E). Two hundred and seventy seven copies of the manual have been disseminated around the world to resource managers and government planners as well as to research organisations in the field of coastal zone and natural resource management (see Table 4).

**Table 4 Distribution of the manual by country and type of organisation**

| Country or region | On-site marine park managers | National govt. resource managers | Govt. depts. | Public research - includes academic | International resource management organisation | Private NGO | Total |
|---|---|---|---|---|---|---|---|
| Tobago | 2 | 3 | 5 | | | 2 | 12 |
| Trinidad | | 4 | 3 | 6 | | 1 | 14 |
| Jamaica | | 6 | | 1 | 3 | 3 | 13 |
| Barbados | 1 | | 10 | | 1 | | 12 |
| Turks & Caicos Islands | 1 | | | | | | 1 |
| Anguilla | | | | | | 1 | 1 |
| Antigua & Barbuda | 2 | | | | | 1 | 3 |
| St Lucia | 1 | 1 | | 4 | | 1 | 7 |
| Cayman Islands | 1 | | | | | | 1 |
| UK | | | 157 | 42 | | 1 | 200 |
| USA & Canada | | 1 | 1 | 3 | | | 5 |
| Indonesia | | | | | | 2 | 2 |
| Australia | 1 | | | | | | 1 |
| Holland | | 1 | | 1 | | | 2 |
| Mauritius | | 1 | | | | | 1 |
| Fiji | | | | | 1 | | 1 |
| Samoa | | | | | 1 | | 1 |
| Total | 9 | 17 | 176 | 57 | 6 | 9 | 277 |

The manual describes practical means of including stakeholders in making decisions about the management of coastal zones, although the approach can be applied in many different resource management settings. The manual does not argue the case for participatory approaches, but assumes that a participatory approach has already been decided upon and is to be implemented. It describes the scope of participation, possible methods of engaging stakeholders and incorporating them into decision-making processes.

The manual contains general information about the nature of participatory research and stakeholder involvement, defines key terms, and provides a step by step approach to identifying and engaging stakeholders, bringing stakeholders together and then applying conflict resolution techniques to find support for management decisions. Examples are provided throughout from the case study at Buccoo Reef Marine Park in South West Tobago, West Indies, where trade-off analysis has been applied to the management problem.

The manual is divided into seven chapters: Chapter One introduces the trade off analysis method and discusses the issue of how to sustain participatory processes and participatory decision-making. Chapter Two provides an overview of the trade-off analysis approach and defines the key concepts underlying the approach, such as, stakeholders, participation, multi-criteria analysis and consensus building. Working definitions are provided for a number of key terms. Chapter Three describes basic methods for identifying, categorising and engaging stakeholders. Chapter Four describes methods for identifying information needs and understanding and structuring decision problems. Chapter Five looks at how information can be managed using multi-criteria analysis and how stakeholders' preferences can be included in the analysis. Section Six tackles issues of how to bring stakeholders together. This section looks at issues relating to conflicts, conflict resolution and consensus building techniques. Finally, Chapter Seven provides a list of references where more information can be obtained. Useful web addresses and contact details for important information centres are also listed. A copy of the manual can be found in Annex F.

The manual has been well received so far. Requests have already been made for additional copies of the trade-off analysis manual by two of the participants at the CANARI workshop, namely Mr Noel Bennett, a Rural Sociologist at the Forestry Department in Jamaica, and Dr Marie-Louise Felix in the Department of Fisheries, St. Lucia. Participants from Anguilla, Turks and Caicos Islands and others expressed interest in follow-up activities relating to wider resource management issues. Dr Jack Ruitenbeek has requested further copies for his counterparts in the Nature Conservancy and government developing the management plan for Komodo National Park, Indonesia. Dr Leslie Walling Deputy Project Manager from Caribbean Programme on Adaptation to Climate Change (CPACC) Regional Project Implementation Unit has requested further copies and has indicated that the manual will be distributed to National Focal Points (NFPs). The NFPs are currently involved in establishing a consultative process for reviewing national issues papers on climate change impacts and adaptation. All of this will feed into the development of national policies for adaptation to climate change impacts. This demonstrates that trade-off

analysis is appropriate for management of land water interface resources more generally than just MPAs, and in many different contexts..

***Summary***

The institutional constraints to applying participatory approaches to resource management in Trinidad and Tobago have been thoroughly explored and a framework for understanding those constraints has been developed. We argue that the utility of this framework, which explores institutional constraints in terms of spaces of dependence and exchange can be used to determine whether a participatory approach may be practically applied in a resource management setting. The framework does not dictate whether participation will generate a "successful" outcome, rather it determines whether or not a participatory process can be applied given the existing institutional design, and where design changes may be required.

Expressions of demand for the manuals on trade-off analysis and demand for earlier work on trade-off analysis reveals that the production of the manual met an existing need. Response to dissemination of the manual in the region and internationally again revealed a demand for more information on the trade-off analysis approach by resource managers and researchers.

## 5. Research Activities

The aims of the research are twofold: to explore and understand the constraints to institutionalising participatory approaches to coastal zone management in Trinidad and Tobago and in other DFID LWI target countries in the Caribbean, and to disseminate the research methods, findings and results from the DFID funded project R6919. The research comprised six main activities (see Box 2) which were undertaken in both Trinidad and Tobago and the UK.

**Box 2 Research activities for R7408**

1. Identifying local level and informal institutions and new institutional mechanisms necessary for implementing 'Trade-off Analysis' for management of LWI resources in Trinidad and Tobago.
2. Developing a co-management framework for Buccoo Reef Marine Park and other coastal resources in collaboration with the Department of Marine Resources and Fisheries.
3. Participating in an international workshop on MPA management to assess the degree of support for and opportunities and constraints for adoption of participatory approaches to tropical MPA management.
4. Identifying the needs for capacity building in regional institutions in order to adopt approaches in collaboration with CANARI.
5. Convening two workshops to promote Trade-off Analysis and other consensus building techniques applied to coastal resources in the region.
6. Producing and disseminating regionally a manual detailing the trade-off analysis approach developed in R6919.

There were three separate periods of field work and dissemination in addition to the on-going work of the Tobago-based team:

1) Undertaking interviews and running the workshop in Tobago (October to November 1999).
2) Presenting a paper at the 9th International Coral Reef Symposium in Indonesia (October 2000).
3) Participating in the CANARI workshop in Tobago (January 2001).

In the first period of field work the opportunities and constraints to institutionalising participatory approaches were explored in a workshop held in Tobago. For a report of the workshop see Annex A. The capacity building needs of regional and local institutions were explored, and the potential for developing a co-management strategy with local stakeholders was explored through re-establishing meetings of the Buccoo Reef Stakeholder Group. The possibility of using the outputs of project R6919 to develop and implement a co-management strategy were investigated through a series of elite interviews with key decision-makers in Trinidad and Tobago. The attitudes and preferences towards participation and participatory decision-making in Trinidad and Tobago elicited from these interviews were reported in a paper presented at the Development Studies Association study group on Environment, Resources and Sustainable Development (DSA/ERSD) - see Annex B. A second paper that analyses the opportunities and constraints to participatory approaches at different institutional scales, and through different networks was recently submitted to the journal *Environmental Planning A* – see Annex C.

During the second period of field work a paper on the trade-off analysis approach and the lessons learned from its application to the Buccoo Reef case was presented at the 9th International Coral Reef Symposium. The paper presented has since been submitted for inclusion in the proceedings of the symposium (see Annex E).

In the third period of field work, a second workshop was convened by the Caribbean Natural Resources Institute (CANARI). Senior natural resource managers from the Caribbean region were invited to attend the workshop on participatory natural resource management, specifically on designing institutions for effective resource management. At that workshop the UEA/UWI/THA team jointly engaged workshop participants in applying aspects of the trade-off analysis process to some of the participants own resource management issues.

The UK based research has involved analysing the data collected in Trinidad and Tobago, and producing a manual on the trade-off analysis approach. The manual describes guidelines for applying the trade-off analysis approach to participatory coastal zone decision-making and has been disseminated within Trinidad and Tobago and to other resource managers in the Caribbean and Pacific (for a copy of the manual see Annex F).

For eleven months of the project there were two permanent Tobago-based researchers. Kathy Young who worked on project R6919, was seconded to the Tobago House of Assembly to continue working with the Department of Marine Resources and Fisheries and the Buccoo Reef Stakeholder Group to explore the potential to develop a co-management arrangement for Buccoo Reef. A counterpart from the Tobago

House of Assembly (Ms Keisha Sandy) worked alongside Ms Young to ensure that the decision-makers were fully engaged in the process. Under the guidance of Dr Arthur Potts, these two Tobago-based counterparts examined the legislative and regulatory constraints to participatory decision-making in Trinidad and Tobago and reviewed other management approaches to marine parks and coastal zones in the Caribbean region, see Annex G.

The Department of Marine Resources and Fisheries, Tobago House of Assembly, played a central role in ensuring the Buccoo Reef Stakeholder Group meetings continued. The two THA counterparts continued to support the newly formed Buccoo Reef Stakeholders Group for 11 months of the project. A summary of the events of the stakeholder meetings is contained in Annex D.

The project was completed according to the project timetable, although two modifications were made. First, one of the research team participated at the 9th International Coral Reef Symposium in October 2000 to maximise dissemination to the wider international community of researchers and coastal managers. Second, at the request of the Tobago House of Assembly, funds were diverted to hiring the second counterpart to work on the reviews of the legislative and regulatory constraints to participatory decision-making in Trinidad and Tobago, and other management approaches to coastal zone management in the Caribbean region. These funds were also used to collect additional water quality data from Buccoo Reef Marine Park (see Annex H). The additional information collected was used to aid decision-makers and to keep the Buccoo Reef Stakeholder Group informed about the quality of Buccoo Reef Marine Park.

## 6. Contribution of Outputs

Understanding the opportunities and constraints to the application of participatory approaches in Trinidad and Tobago has provided insight into existing resource use strategies in coastal production systems and courses of action for improving these strategies within target institutions. The Tobago House of Assembly is aware of the constraints to participatory resource management and has been investigating, in collaboration with UEA, the institutional and regulatory constraints to participation. In addition, the Tobago House of Assembly has been investigating the co-management approaches to natural resources applied in other Caribbean islands. This information is being compiled in order to advise the Tobago House of Assembly on possible alternative institutional arrangements for managing Buccoo Reef Marine Park, and the Speyside area, both in Tobago. These alternative institutional arrangements are likely to involve some element of co-management or community-based resource management. In terms of developing improved resource use strategies for the coastal zone, the Tobago House of Assembly, through the Department of Marine Resources and Fisheries has indicated that it will use participatory approaches in its coastal resource management planning.

As evidence of the support for the trade-off analysis process and institutionalisation of the process, the Tobago House of Assembly has recruited the UEA/THA collaborator who was working with the Buccoo Reef Action Group as a full time member of staff.

Further dissemination of the research results and the method has increased the potential for the uptake of the trade-off analysis method by other target institutions. The Institute of Marine Affairs and the Environmental Management Authority, both in Trinidad, and CANARI have continued to express their interest in applying the method. Dissemination of the manual on trade-off analysis to all target institutions and more widely should facilitate the application of trade-off analysis by interested groups.

The contribution of the project to achieving the outputs is detailed in Box 3.

The findings and the methods have been disseminated widely, within Trinidad and Tobago, the Caribbean region and internationally (see Box 4). The main means of dissemination have been:

- Production and dissemination of 280 manuals on 'Trade-off analysis for participatory coastal zone decision making'.
- Presentation of the trade-off analysis methodology at three international conferences in Japan, Indonesia and the UK, and to researchers at universities in the UK, Australia and New Zealand.
- A paper on the trade-off analysis method has been accepted for publication in *Ecological Economics,* and a paper on the institutional constraints to participatory approaches has been submitted to *Environment and Planning A*.
- Hosting a workshop in Tobago for senior resource managers in Trinidad and Tobago in November 1999, and participating in a CANARI workshop for regional resource managers in January 2001.
- Interviews and meetings held with target institutions in Trinidad and Tobago, and the Caribbean region in October 1999 and January 2001, when information and publications were disseminated.

## Box 3 Summary of project outputs from the project logical framework

**Output 1: Opportunities and constraints to the institutionalisation of participatory techniques to marine and coastal resource management within target institutions identified and assessed.**

Semi-structured interviews with persons within target institutions were carried out in Trinidad and Tobago in October and November 1999. In addition a workshop on 'The Potential Role of Trade-off Analysis for Natural Resource Management in Trinidad and Tobago' was held in November 1999. The proceedings from the workshop were written up and disseminated to all workshop participants (Adger et al. 1999). The findings from the workshop and interviews have been synthesised into two papers. One of the two papers - on the pre-conditions for participatory resource management – was presented at the Development Studies Association Environmental Resources and Sustainable Development (DSA/ERSD) study group meeting in May 2000 (Tompkins et al. 2000). The other paper which explored institutional networks was submitted to the journal *Environment and Planning A* (Tompkins et al. 2001).

Two full-time researchers were engaged to work with the Tobago House of Assembly and the Buccoo Reef Action Group as part of the process of institutionalising a participatory approach to decision making for Buccoo Reef. One of the two counterparts has since been appointed to work full time within the Tobago House of Assembly.

**Output 2: Applicability and adaptability of 'trade-off analysis' to other LWI and coastal resources in the region evaluated.**

A paper was presented at the 9th International Coral Reef Symposium in October, 2000 on the applicability of trade-off analysis to marine protected area management, and lessons learned for management. Positive feedback from the symposium participants and a request for additional information from 32 individuals who attended the session provides evidence of interest in the method and the potential for uptake in other areas.

At the workshop on 'Designing Participatory Institutions for Effective Management' convened by CANARI, participants had the opportunity to apply elements of the trade-off analysis approach to resource management dilemmas that they were facing. Four resource management dilemmas were examined and the methods applied. Feedback from the groups revealed a general interest in applying the trade-off analysis approach to resource management issues.

The utility of applying trade-off analysis to resource management was also assessed in the interviews with resource managers in Trinidad and Tobago, CANARI, OECS and DFID Caribbean during October and November 1999. Respondents suggested that while small islands are in need of new institutions for management, where traditional management roles cannot be supported by government due to lack of resources, there are clearly institutional constraints to implementing participatory management approaches.

**Output 3: Participatory approaches, conflict resolution and consensus building techniques disseminated regionally**.

- Two workshops were successfully completed in Tobago. At both workshops all members of the UEA/THA collaborative research team presented aspects of the trade-off analysis method.
- A manual on trade-off analysis was produced. Almost 300 of these manuals have been disseminated globally.
- Presentations on the participatory approaches, consensus building and the trade-off analysis method were made to all the target institutions (THA, EMA, IMA, UWI, CANARI, and DFID Caribbean) during the field trip to the eastern Caribbean region in October and November 1999.
- Two papers have been submitted to academic journals for publication, a further one has already been accepted. A third paper will be included in the proceedings of the 9th ICRS.

**Box 4 Formal dissemination and presentations**

1 Presentation on 'Engaging with stakeholders and trading off their preferences: Marine protected areas in the Caribbean' at the 1999 Open Meeting of the Human Dimensions of Global Environmental Change Research Community, Shonan Village, Kanagawa, Japan, June 1999.

2 Presentation on 'What the North can learn from the South? Deliberative and Inclusionary Processes and Development Studies' at the ESRC seminar series on Deliberative and Inclusionary Processes, University of East Anglia, Norwich, July 1999

3 Convened a one-day workshop on the Potential Role of Trade-off Analysis in natural resource management in Trinidad and Tobago, Rovanel's Resort, Bon Accord, Tobago, 27 October 1999.

4 Distributed 50 copies of the *Report of the workshop on the potential role of trade-off analysis in natural resource management in Trinidad and Tobago* to all 35 workshop participants, and 15 others who expressed interest in the workshop.

5 Presentation on 'Evaluating economic, social and environmental impacts of development: a case study of Buccoo Reef Marine Park' to a Geography Department research seminar, University of Canterbury, Christchurch, New Zealand, March 2000

6 Presentation on 'Trade-off analysis for marine protected areas: A case study of Buccoo Reef Marine Park, Tobago', and at the Centre for Resource and Environmental Studies, Australia National University, Canberra, Australia, April 2000.

7 Presentation of paper 'A Hierarchy of Institutional Pre-conditions for Participatory Natural Resource Management' to the Development Studies Association Environmental Resources and Sustainable Development Study Group Conference on Environmental Resources: Conflict, Co-operation and Governance, May 17-18, 2000, Development and Project Planning Centre, University of Bradford, Bradford, U.K.

8 Presentation on 'Sustainability and Empowerment', British Association for the Advancement of Science Festival, September, London, September 2000

9 Presentation to the School of Development Studies Natural Resources Research Group at the University of East Anglia, on 'Conflict over damaged goods: the end of the road for tropical coastal zone management', on 16th October, 2000, UEA, Norwich.

10 Presentation of paper 'Trade-off analysis for marine protected areas' at a mini-symposium entitled 'Bringing social sciences and economic issues into coral reef management' as part of the 9th International Coral Reef Symposium, 23-27 October, 2000, Nusa Dua, Bali, Indonesia.

11 Presentation on 'Participation in Coastal Zone Decision-making by Diverse Individuals, Groups and Institutions' at NRSP Poverty Workshop, November 2000.

12 Plenary presentation on 'A new dialogue? Interdisciplinary research for conservation and development'. Launch of UEA Centre for Ecology, Evolution and Conservation, 12-13 January.

13 Joint UEA/THA presentation to CANARI workshop participants on 'Designing Participatory Institutions for Effective Management' on January 23rd 2001, the Buccoo Reef case study.

14 Presentation of the manual, and an overview of the trade-off analysis approach, followed by a question and answer session, to 20 researchers and the Director from the Institute of Marine Affairs, Trinidad, on January 24th 2001.

15 Series of shorter informal presentations of the manual, and an overview of the trade-off analysis approach to: Director of Wildlife Division, Trinidad, Director of Town & Country Planning, Trinidad, Director Economic Planning, THA, 2 senior researchers at the Policy Research and Development Institute, THA, Environment TOBAGO, Manager Department of the Environment, THA on January 24th – 25th, 2001.

Final project presentations to and meetings with resource managers in Trinidad and Tobago in January 2001 revealed continuing support for the trade-off analysis method. There was also a strong interest in results from the investigations into opportunities and constraints to applying participatory resource management approaches.

***Lessons Learned***

- Trade-off analysis is appropriate for application to wider natural resource management issues. Current application to forest management in Canada reveals the versatility of the approach.

- Trade-off analysis does not have to be applied as an entire package but elements within it may be appropriate for different resource management situations.

- Institutions can constrain their ability to implement participatory approaches by restricting their spaces of exchange and dependence.

- Knowledge exists within institutions to determine the opportunities and constraints to participatory resource management. This knowledge can be extracted by considering the institution at different scales.

- Preconditions for participatory resource management can be usefully evaluated at the different scales. For the resource management issues at Buccoo Reef, these scales are: community level, institutional structure, and legal and regulatory setting.

- Individual actors can play a central role in determining spaces of exchange and dependence. Further research on human and organisational behaviour may generate greater understanding of the conditions that enable rogue individuals to exert excessive influence on an institution.

## 7. Publications and other communication materials

1. Books and book chapters

none

2. Journal articles

2.1 Peer reviewed and published

None

2.2 Pending publication

Adger, W. N., Brown, K., Tompkins, E., Bacon, P., Shim, D., and Young, K. (2000) Trade-off analysis for marine protected areas. Accepted by *Ecological Economics* in 2000 for publication in 2001. Attached as Annex I.

Tompkins, E., Adger, W. N., Brown, K. (2001) Institutional networks as determinants of successful participatory natural resource management. Submitted to *Environment and Planning A*.

Brown, K. Beyond consensus and empowerment: sustainability in linking conservation and development, submitted to *Geographical Journal*. (features Buccoo Reef case study)

2.3 Drafted

None

3. Institutional Report Series

Adger, W. N., Brown, K., Tompkins, E., (2000) Trade-off analysis for marine protected areas. *CSERGE GEC Working Paper 2000-02*. Centre for Social and Economic Research on the Global Environment, University of East Anglia, Norwich, U.K.: 32.

Adger, W. N., Brown, K., Tompkins, E. and Young, K. (1999) *Report of the Workshop on The Potential Role of Trade-off Analysis in Natural Resource Management in Trinidad and Tobago.* Overseas Development Group Working Paper, November 1999, University of East Anglia, Norwich: 23

4. Symposium, conference, workshop papers and posters

Tompkins, E., Brown, K., Adger, W. N., Bacon, P., Young, K., and Shim, D. (2001) *Trade off analysis for marine park management: institutional lessons learned for participatory resource management.* Submitted for inclusion in the Proceedings of the 9th International Coral Reef Symposium.

Tompkins, E., Adger, W. N., Brown, K. (1999) *A hierarchy of institutional pre-conditions for participatory coastal zone decision-making.* Paper presented at Environmental Resources and Sustainable Development Study Group of the Development Studies Association multi-disciplinary conference on 'Environmental Resources: Conflict, Co-operation and Governance'. May 17-19, 2000, University of Bradford, Bradford, U.K.

5. Newsletter articles

Article on '*Consensus building in the Caribbean'* appeared in January 2001 issue of New Agriculturist (internet publication) at
http://www.new-agri.co.uk/01-1/develop/dev03.html -Attached as Annex J

6. Academic theses

None

7. Extension oriented leaflets, brochures and posters

None

8. Manuals and guidelines

Brown, K., Tompkins, E., Adger, W. N (2001*) Trade-off analysis for participatory coastal zone decision-making*. Overseas Development Group, University of East Anglia, Norwich, U.K: viii + 109.

9. Media presentations (video, web sites, TV, radio, interviews etc…)

None

10. Reports and data records

10.1 Citation for the project Final Technical Report

Brown, K, Adger, W. N., Tompkins, E., (2001) *Building Consensus Amongst Stakeholders for Management of Natural Resources at the Land-Water Interface: Final Technical Report to DFID Land-Water Interface Programme.* February 2001, Overseas Development Group, University of East Anglia, Norwich, U.K.

10.2 Internal project technical reports

none

10.3 Literature reviews

none

10.4 Scoping studies

none

10.5 Datasets

none

10.6 Project website

under development

## 8. Project logframe: Building Consensus amongst stakeholders for management of natural resources at the Land Water Interface

| Narrative summary | Measurable indicators | Means of verification | **Important assumptions** |
|---|---|---|---|
| GOAL:<br>Benefits for poor people in targeted countries generated by application of new knowledge to natural resources management in the land water interface | By 2005 evidence of application of research products to benefit target communities by achieving one or more of:<br>sustainable production increase<br>less variable production<br>productivity increase<br>improved employment (numbers, income, quality)<br>increased access by poor people to RNR output | DFID commissioned reviews<br>Monitoring against relevant baseline data<br>Reports of in-country institutions<br>National statistics. | Enabling environment (policies, institutions, markets, incentives) for widespread adoption of new technologies and strategies exists. |
| PURPOSE:<br>Improved resource use strategies in coastal production systems developed and promoted and local livelihoods improved through reduced coral reef and other coastal resource degradation | By 2002 new approaches to integrated natural resource management and prevention of pollution which explicitly benefit the poor validated.<br>By 2004, these new approaches incorporated into strategies for the management of coastal resources and adopted by target institutions | Reviews by Programme Manager<br>Reports of research team and collaborating / target institutions<br>Local, national and international statistical data<br>Data collected by the Programme Manager | Target institutions invest in the uptake and application of research results |
| OUTPUTS:<br>1. Opportunities and constraints to the institutionalisation of participatory techniques to marine and coastal resource management within target institutions identified and assessed<br>2. Applicability and adaptability of 'trade-off analysis' to other LWI and coastal resources in the region evaluated<br>3. Participatory approaches, conflict resolution and consensus building techniques disseminated regionally | Adoption of participatory techniques by target institutions initiated by end of project (September 2000)<br>Workshops successfully convened by September 2000<br>Manual produced and disseminated by September 2000<br>Paper prepared for submission to academic journal by September 2000 | Reports on progress will be made according to normal guidelines – quarterly, annual and final. | Participation of local government officials and NGOs in regional workshop<br>Effective dissemination of research findings to local government and NGOs |
| ACTIVITIES: | BUDGET SUMMARY: | Quarterly, Annual and Final | Continued local collaboration |

| | | | |
|---|---|---|---|
| 1.1 Identify local level and informal institutions and new institutional mechanisms necessary for implementing 'Trade-off Analysis' for management of LWI resources in Trinidad and Tobago<br><br>1.2 Development of co-management framework for Buccoo Reef Marine Park and other coastal resources in collaboration with Department of Marine Resources and Fisheries<br><br>2.1 Participation in Workshop on MPAs in the Caribbean (Jamaica, July 1999) to assess the degree of support for, and opportunities and constraints for adoption of participatory approaches to MPA management in the region<br><br>2.2 Identify the needs for capacity building in regional institutions in order to adopt approaches, in collaboration with CANARI<br><br>3.1 Convene two workshops: one in Tobago and one regional (potentially through CANARI and/or DFID regional office) to promote Trade-off analysis and other consensus-building techniques applied to coastal resources in the region<br><br>3.2 Manual detailing the approaches developed and based on the work undertaken in R6919 and subsequent analysis produced and disseminated regionally | Salaries: 38010<br>Overheads 16604<br>Overseas Travel: 9900<br>Equipment 0<br>Misc.(UK travel, collaborators, communications, workshops) 13280<br>VAT 0<br><br>Total: £77,794<br>(over 15 months) | Research Reports<br>Field visits and reports<br>Briefing papers detailing methods and scenarios generated<br>Academic publications | and participation with all stakeholders<br>Continued successful collaboration with regional institutions |

**9. Keywords**

Stakeholders, coastal zone, natural resource management, participation, trade-off analysis, Trinidad and Tobago, institutions, Buccoo Reef, UEA, THA, marine protected areas

**10. References**


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## 11. Annexes