



Trade-off Analysis for Participatory Coastal Zone Decision-Making

Katrina Brown, Emma Tompkins, W. Neil Adger



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Katrina Brown

Emma Tompkins

W. Neil Adger

Overseas Development Group

University of East Anglia

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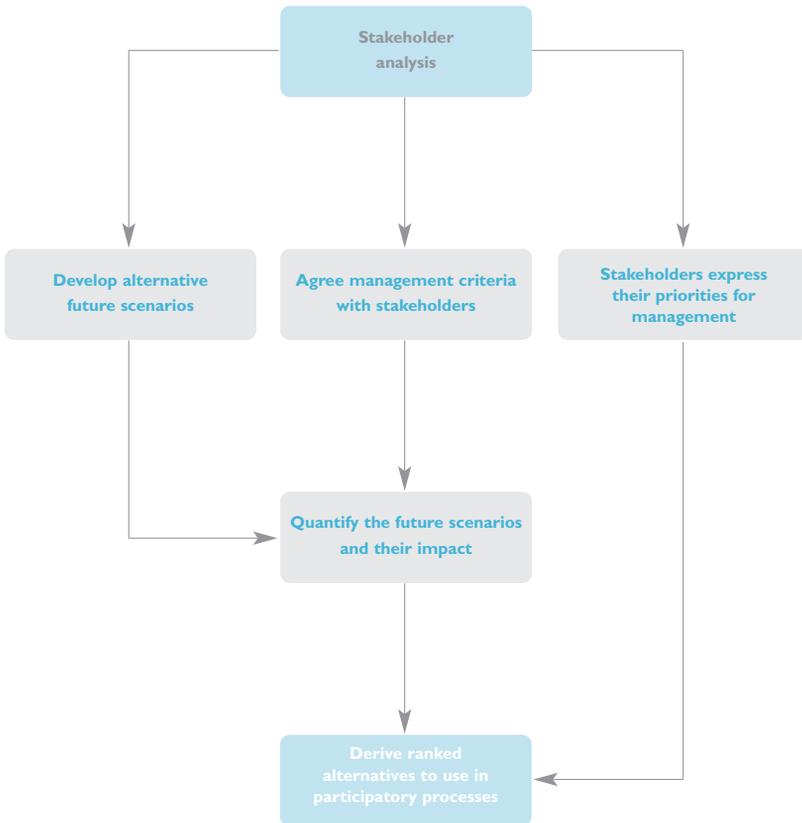
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C H A P T E R 1

Objectives and Overview



Stakeholder analysis

Multi-criteria analysis

Participatory consensus building

Topics covered

- Rational for the approach
- Structure of the manual
- Purpose and target audience
- Skills needed to apply the approach
- Example of an application of trade-off analysis
- Issues for consideration for a long term commitment to participatory decision-making

1.1. Why employ participatory decision-making for coastal zone management?

The purpose of this manual is to promote practical means of including stakeholders in making decisions about the management of coastal zones. The approach can be applied in many different resource management settings. The approach described is a three-step process known as trade-off analysis.

Effective coastal zone management is important to improve the well-being of communities who depend on coastal resources now and in the future. Finding a balance between satisfying competing present-day demands, without compromising the potential for future users of coastal resources to maintain their well-being is one of the central objectives of coastal zone management.

Coastal zone management is a complex issue. The complexity stems from the same factors that make coastal zones such important resources.

- Coastal zones provide a range of different goods and services (fish, recreation, natural beauty, shoreline protection) to many diverse users (fishing communities, tourist sector operators, residents).
- Coastal zones can span nations or regions, and it is difficult to restrict access to them.
- There are a range of different natural environments at the land-water interface, each environment has the capacity to affect the others, making management a complex task.
- Coastal zones play important cultural roles and support social interactions in diverse ways.

Given the diversity of functions and users of coastal zones, management can become mired in conflict and disagreement. It is therefore necessary to engage stakeholders to promote solutions that command broad agreement and are likely to be successfully implemented.

Wide participation in coastal zone management on its own is not a panacea to coastal zone management problems. In cases where there are multiple users competing over scarce resources, participation may offer support to decision-makers in developing or implementing management plans. This manual describes techniques to support participation in coastal zone decision-making by diverse individuals, interest groups and institutions.

1.2. Structure and organisation of the manual

This manual contains 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 them together and applying conflict resolution techniques to find support for management decisions. Examples are provided throughout from a case study of trade-off analysis applied to the management problem at Buccoo Reef Marine Park in South West Tobago, West Indies. The examples provide detailed insights into how the tools and techniques have been applied, and offer advice on how to avoid potential mistakes.

- Chapter 2** defines the key terms and concepts underlying participatory approaches, and provides an overview of the trade-off analysis approach. Working definitions are provided for a number of key terms, such as, stakeholders, participation, focus groups and multi-criteria analysis.
- Chapter 3** describes methods for categorising and engaging stakeholders using techniques such as focus groups and interviews. It also covers the related issues of trust-building and the appropriate level of inclusiveness of the participatory approach.
- Chapter 4** describes how to determine what information needs to be collected and the method of working with stakeholders to agree management criteria. It also examines the process of organising information to support participation in coastal zone management.
- Chapter 5** describes how information can be managed using multi-criteria analysis and how stakeholders' preferences can influence the outcome when incorporated in the analysis.
- Chapter 6** suggests methods to bring stakeholders together and examines issues relating to conflicts, conflict resolution and consensus building techniques.
- Chapter 7** provides references where more information can be obtained. Useful web addresses and contact details for important information centres are also listed.

Throughout the text three main aids are used: definition boxes, ‘go to’  indicators and **blue text**. In addition, there is a full reference list in Chapter 7, where readers can find further information.

For practical help within the manual definition boxes are used. ‘Definition boxes’ offer users a working definition of an important concept or phrase.

Definition

A *definition* is a formal and concise statement of the meaning of a word or phrase.

‘Go to’ indicators point readers to additional information on the same topic that can be found within the manual.

e.g.  Section 7.1

Words that are in **blue** can be found in the Glossary of Terms in section 7.3.

Chapters 3 to 6 describe specific elements of the trade-off analysis approach. Readers can utilise individual chapters, as each chapter gives direction on how to start and complete the different activities described in the chapter title. In addition combinations of chapters describe the approaches used in the manual, for example, if the reader wanted to undertake a thorough stakeholder analysis they should read Chapters 3 and 6. If the reader wanted to undertake a multi-criteria analysis they should read Chapters 4 and 5. Or, if a reader just wanted to employ conflict management techniques they should dip into Chapters 3, 4 and 6.

The manual is structured so that key terms and definitions are described within one chapter (Chapter 2), although more information on each topic can be found in other chapters, and simple descriptions of important terms can be found in the Glossary.

1.3. Purpose and target audience

The manual has been written as ‘how to’ guide for participatory decision-making, specifically on how to apply the trade-off analysis approach. This manual is for use by extension workers in the field as well as to those preparing for field work where participatory approaches may be used. It is useful to government, NGO’s, research organisations, or other agencies interested in employing participatory decision-making techniques for resource management. It may also be of use to policy makers who are interested to learn the practical steps that are involved in applying a participatory approach to decision-making. It is however, fundamentally, a practical guide. While the focus is on the coastal zone the more general lessons learned are applicable to other resource management issues including forestry, fisheries and watershed management.

1.4. Skills needed to apply the approach

The manual describes a range of methods for working with stakeholders, undertaking conflict management and consensus building techniques as well as a statistical method for analysing numerical data. Each of these methods requires very different skills. Therefore, a small team is the best option for implementing the method. One of the members of the team should have a reasonable level of numeracy, and be confident with multiplication, and division. A basic understanding of statistical calculations such as averages and ratios is necessary. If the mathematical content is too complicated, statistical computer software packages can be useful.

At least one other team member will ideally have some experience of working directly with people, and have an understanding of the social skills that are needed for such work. Working with stakeholders can be very rewarding, but it requires a lot of patience, tolerance, and a non-judgemental attitude.

A central part of the process comes from sharing information. Therefore, all team members must be willing to share the information they collect and transform possible complex economic, social or ecological data into accessible information for lay-people. Other important considerations when working with stakeholders are honesty and integrity. It is important for people working with stakeholders to be honest about their motives for undertaking the work, and honest about the expected outcomes. Raising stakeholders' hopes or expectations without the ability to deliver promises is unethical and ultimately damaging to the research process and the stakeholder groups' trust in the process. Finally the researchers must treat all stakeholders with equal respect. Without these standards, trust is unlikely to be built, and the process is much less likely to be successful.

1.5. A note on developing a longer term commitment to participatory decision-making

To sustain participatory approaches in the longer term, there often has to be a change in many different areas, including, national legislation or local bylaws, government organisational structure and the way in which work is carried out.

Participatory approaches work best when there is commitment to them by the implementing agencies and the highest level decision-makers. In addition, the legislative and regulatory conditions have to be appropriate for implementation. In many countries, existing legislation does not readily support participatory approaches. Institutions may need to be strengthened through capacity building or other means; financial resources may be required to support the process. All these issues need to be tackled to institutionalise participatory approaches.

It is not the role of the researcher to make these changes, however, the researcher should be aware of these changes that would be necessary if a longer term commitment to participation were to be pursued.

1.6. Case Study: Buccoo Reef Marine Park

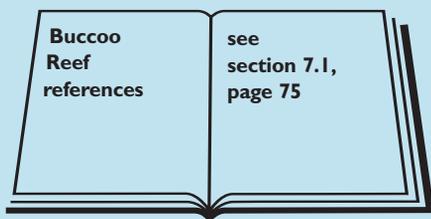
The trade-off analysis approach has been successfully applied to resource management at the Buccoo Reef Marine Park in Tobago, West Indies. Throughout this manual examples are given which refer to this application of the trade-off analysis approach. Examples are separated from the text through the use of ‘Example Boxes’.

Example 1.1 The management problems at Buccoo Reef, Tobago

The Buccoo Reef is one of the most visited recreational sites in Tobago. Both foreign and local visitors enjoy the beauty of the coral reefs, the clear waters and abundant marine life that can be found there. Tourism has become an important contributor to local incomes yet it degrades the natural resource base on which many islanders directly depend for their livelihoods. Thus tourism brings benefits to Tobago, but not for everyone. The challenge is therefore to find ways of managing the Buccoo Reef that are acceptable to stakeholders while maintaining environmental quality to certain minimum standards.

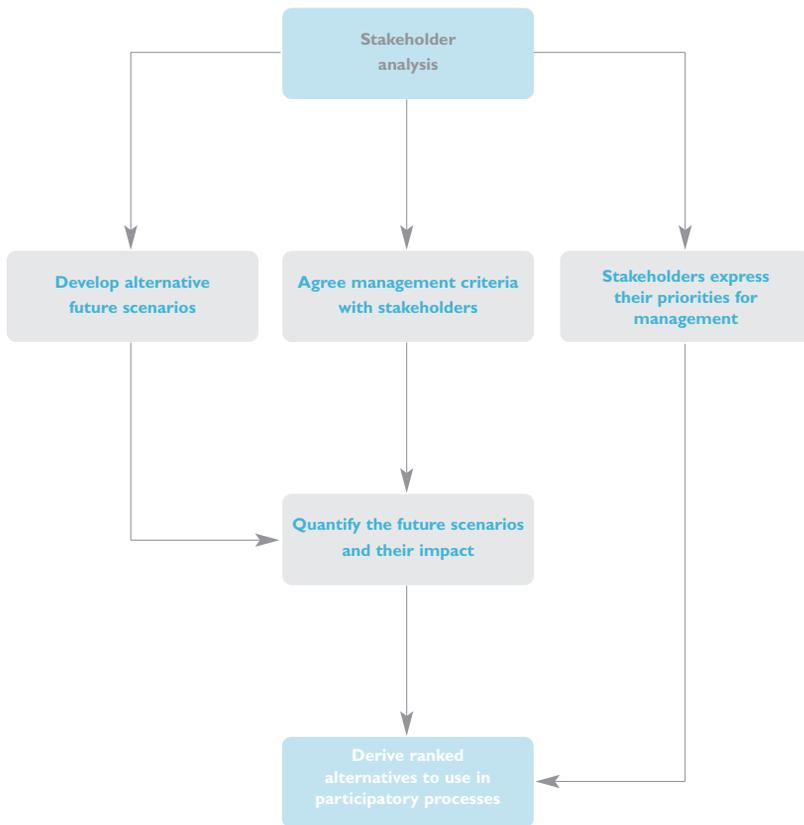
The issue of how best to manage Buccoo Reef has been on-going since the 1960’s when the appropriateness of clearing mangroves in the coastal zone to make way for tourism developments was questioned. The impacts of tourism development have been a major coastal zone management issue for Buccoo Reef to the present day.

A collaborative research team from the University of the West Indies, the University of East Anglia, and the Tobago House of Assembly proposed applying the trade-off analysis process to help understand the decision-making process for Buccoo Reef Marine Park and to try to find consensus on management priorities. This work was undertaken between 1997 and 1999.



C H A P T E R 2

Defining key terms and concepts



Stakeholder analysis

Multi-criteria analysis

Participatory consensus building

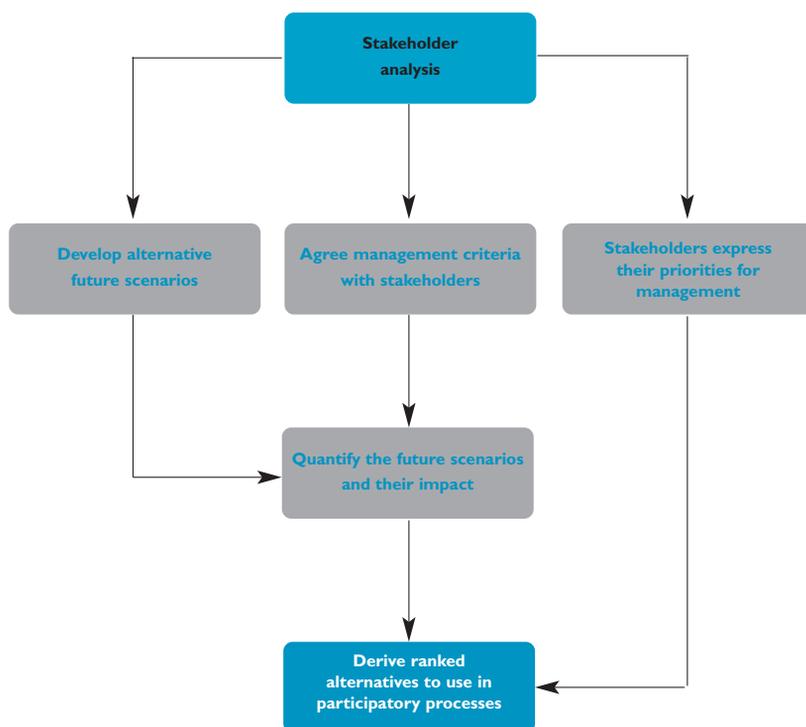
Topics covered

- Trade-off analysis
- Coastal zone management
- Conflicts
- Focus groups
- Multi-criteria analysis
- Participation
- Stakeholder analysis

2.1. Trade-off analysis

Trade-off analysis is a process whereby stakeholders are engaged to consider the merits of different management strategies, and explicitly determine management priorities (see Figure 2.1). It requires information to be able to answer stakeholders' questions about impacts of different activities on the resource in question. Organising that information, so that it is understandable and useable is a central feature of trade-off analysis. Trade-off analysis is a tool that can help decision-makers understand resource use conflicts and stakeholders' preferences for management.

Figure 2.1 The Trade-Off Analysis Process



Stakeholder analysis

Multi-criteria analysis

Participatory consensus building

Trade-off analysis begins with a **stakeholder analysis** to identify stakeholders, and a conflict assessment to determine stakeholders' **interests** and potential use-conflicts. Information from the analysis can be used to generate future **development scenarios**. The stakeholders who have been identified as important to the process are then engaged to agree upon a set of likely impacts of the alternative future scenarios (these impacts are referred to as the **management criteria**) for the resource under investigation - in this case the coastal zone. This information forms the basis for the **multi-criteria analysis**. Information is collected to determine the impacts of the alternative future scenarios on each of the management criteria. This information is collated in an '**Effects Table**', a table containing all the information.

Multi-criteria analysis is used to analyse the data that has been collected. The multi-criteria analysis method generates a ranking of the alternative future scenarios, from a least preferred outcome to a most preferred outcome. The impact of the stakeholders' management preferences on this ranking is then assessed. The stakeholders are again engaged and asked to express their priorities for management in an iterative process using information dissemination, trust building and consensus building techniques. At each stage of the iterative process the stakeholders' preferences, in the form of **weights**, are fed into the multi-criteria analysis model. Each time a ranking of outcomes is generated and this is circulated to all other stakeholder groups. Again, using consensus building techniques, the stakeholders are given the opportunity to reconsider their prioritisation in light of the other groups' stated priorities. The purpose of this is to reveal to stakeholder groups the areas of consensus on which they already agree, and to indicate to the decision-makers the future development options that would be supported by the stakeholders.

Finally, all the stakeholder groups are brought together in a consensus building workshop to identify specific management decisions they support, and actions that they can undertake to contribute to the desired outcome.

Trade-off analysis can be undertaken at a range of levels of participation and available information. The depth of the analysis depends on the available resources to expend on the investigation.

Within the trade-off analysis process the major activities are:

1. Identification and classification of the stakeholders and their interests.



Chapter 3, sections 3.1, 3.2, and 3.3

2. Identification of the alternative courses of action open to the decision makers (the alternative future development scenarios).



Chapter 4, sections 4.1, 4.2 and 4.3

3. Identification of the main issues and concerns of the stakeholders - the management criteria.

 Chapter 4, section 4.4

4. Estimation of the impact of each of the alternative courses of action on the management criteria.

 Chapter 4, sections 4.5 and 4.6, Chapter 5

5. Engaging stakeholders to create management priority weights.

 Chapter 3, sections 3.4 and 3.5, Chapter 6, section 6.1

6. Building consensus among the stakeholders using the information collated and weights elicited to find areas of common understanding.

 Chapter 6, sections 6.2 and 6.3

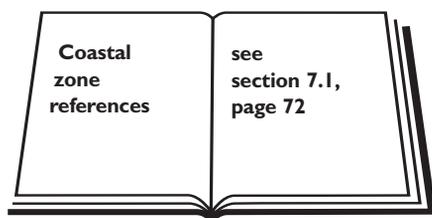
2.2. Coastal zones

Coastal zones provide a wide range of economic, social and environmental benefits. They are frequently centres of economic activity, industry, population growth and transport links. Approximately 50 percent of the world's population presently live in the coastal zone and this is likely to increase in the future with urbanisation, migration and development. Coastal zones are expected to provide clean and safe environments for human habitation, yet they have to absorb large amounts of human-generated waste. As a result, coastal zones are possibly the most stressed of all our natural ecosystems.

What is a coastal zone?

Coastal zones have three elements:

1. The offshore zone, from the low water mark to the sea,
2. The inter-tidal zone, from the low water mark to the seaward edge of the coastal vegetation, or to the base of a cliff or dune;
3. The adjoining coastal land, from the landward limit of the beach inland.



2.3. Coastal zone management

Coastal zone management is a relatively new concept; a range of differing opinions exist on how best to manage the often complex, multiple use coastal resources. Some proposals for management include allocating ownership rights and other property rights to bring the resource under private or state control. Examples are the designation of marine protected areas - these bring marine resources under the control of a government agency. Designating ownership rights is often proposed as a means to minimise the chances of over-use and over-exploitation of the coastal resources by ensuring long term management on behalf of society. This does not always occur due to the simultaneous existence of both legal and informal ownership rights that exist within coastal zones.

Table 2.1 Coastal zone management strategies

Approach	Summary and objectives
Allocation of property rights	Privatising commonly owned resources or bringing them under government control, prevents over-use of resources.
Creation of exclusive marine protected areas or restrictive zones	Marine protected areas reserved by law or other effective means to protect part or all of the enclosed environment. They are often part of fisheries management strategies as marine areas act as spawning grounds for important fish species.
Integrated coastal zone management	A continuous and dynamic process that unites government and the community, science and management, sectoral and public interests in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources.
Co-operative coastal zone management	A framework that guides diverse and conflicting individual interests into 'co-operative' collective decisions which draw maximum support, and enhance stakeholders willingness to voluntarily co-operate in the implementation.
Learning based coastal zone management	Management initiatives are experiments which must be subjected to scientific rigour in terms of developing hypotheses for testing, use of control sites, documentation of the experiment and analysis.
Community-based management	Local communities and other stakeholders who choose to engage in management of a coastal resource.

Sources:

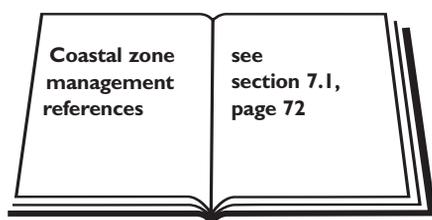
Crance, C, and D. Draper (1996), Socially Co-operative Choices: An Approach to Achieving Resource Sustainability in the Coastal Zone. *Environmental Management* 20 (2), pp. 175-184

Olsen, S., J. Tobey, and L.Z. Hale (1998), A Learning-based Approach to Coastal Management. *Ambio*, 27 (8), pp.611-619

White, A.T., L.Z. Hale, Y. Renard, and L. Cortesi (1994) *Collaborative and community-based management of coral reefs. Lessons from experience.* Kumarian Press, Hartford, Connecticut.

Zoning and allocating user rights to specific areas, engaging stakeholders in management, and creating exclusive reserves or protected areas to promote conservation are other methods of management that have been applied. Some of the strategies for coastal zone management are summarised in Table 2.1. The range of approaches used attests to the fact that there is still much uncertainty on how best to manage the coastal zone.

While a variety of management approaches exist the debate continues about the most appropriate form of management. There is some consensus that participation in decision-making can contribute to sustainable management and use of natural resources. Participation is particularly relevant for complex multiple use resources, where conflicts can develop over management objectives. It is also relevant where different stakeholders' needs may lead to use-conflicts. In these cases participation can lead to more robust management processes, particularly for small island states, where participatory decision-making can enhance self reliance while maintaining resource integrity.



2.4. Conflicts

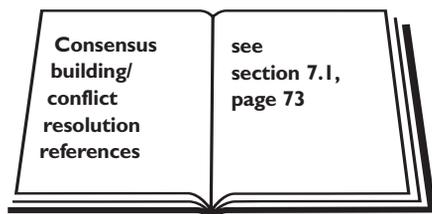
Conflicts are a part of our daily lives, and people manage them in different ways. Differences and conflicts between people can lead to disputes which cause a break down of communication between those people. Disputes are common when trying to develop management strategies for multiple-use resources. When conflicts arise it is difficult to get the disputing parties to talk together and to find areas on which they agree as many have become attached to their stated positions - and the issue has become 'personal'.

There are four main types of conflict:

1. Conflicts over *information or facts*. These types of conflicts can often be dealt with by collecting additional objective information.
2. Conflicts over *values or beliefs*. This could be conservation versus development, or cultural value versus economic value of the resource. Where values or beliefs are firmly rooted, there is often no possibility of conflict management. The only option is to agree to disagree.
3. Conflicts about *inter-personal relationships*. Relationship conflicts tend to develop when different stakeholders compete for position and engage in posturing whereby they stake personal reputations or pride on certain outcomes. Personality clashes between and within stakeholder groups can most often be resolved by neutral third party intervention.

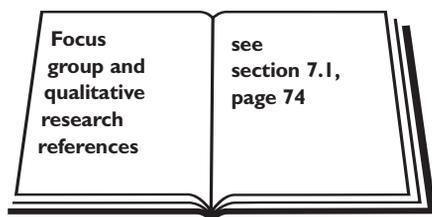
- Conflicts of *interests or needs*. This is the area where conflict management can play the most useful role. Conflicts of interest are the focus of this manual.

Consensus building and conflict management techniques can be used to resolve conflicts over inter-personal relationships and conflicts over interests or needs. These techniques are explained in detail in Chapter 6.



2.5. Focus groups

Focus groups are group interviews, where individuals are brought together to consider and discuss a specific topic. The purpose is to generate qualitative in-depth information about the attitudes, beliefs and feelings of a group of individuals towards an issue. Focus groups do not use a question and answer format, where a question is posed and answers are given, rather they are led by a moderator who encourages discussion and interaction between individuals in the groups. The issues to be discussed are pre-determined by the researcher - who usually acts as the moderator for the group. Typically, groups of 4-10 people discuss issues raised by the moderator for 90-120 minutes. Group members are selected on the basis of common characteristics of relevance to the issue being discussed, such as gender, age, profession, home location.



2.6. Multi-criteria analysis (MCA)

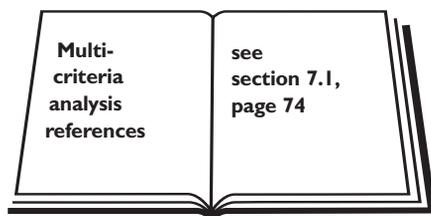
Making decisions about how to manage coastal zones involves many stakeholders, who often have different ideas about how the area should be managed and about which issues are most important in the decision-making process. Multi-criteria analysis provides a useful framework within which the issues and management objectives can be considered. Multi-criteria analysis also displays the information on which decisions are being made in a clear format.

Multi-criteria analysis (MCA)

Multi-criteria analysis is a method of choosing between a set of alternative options on the basis of a set of defined evaluation criteria. It is a tool that is often used to support decisions where there are conflicting management objectives and conflicting stakeholder preferences.

Multi-criteria analysis (MCA) is a flexible method of analysis that can evaluate and rank the range of management options that often exists for natural resources. There is rarely an immediately preferable option as it is often the case that there is a range of management objectives. For example the government may be trying to ensure that the coastal zone management system: provides an equitable distribution of the benefits from management among all stakeholders, maintains employment levels, minimises costs and maintains water quality all at the same time. Multi-criteria analysis provides a useful tool for comparing the impacts of the different options.

Multi-criteria analysis requires an identification of the possible development options and an assessment of the impacts of those options on a set of management criteria. Once identified, multi-criteria analysis can be used to rank the development options in terms of their impacts on the criteria. Multiple users' preferences for different management priorities can be included through the use of weights. The weighted ranking of development options can be compared with the unweighted rankings to inform decision-makers about the level of support for and the possible impact of their decisions.



2.7. Participation

Participation

Participation most often means, taking part in, or being actively involved in a process.

Participation in natural resource management can exist in many forms, and can use many different levels of inclusion. At the most basic level participation can be passive consultation where information is disseminated and those impacted are informed of future plans. At its most active participation involves people and communities in sharing power and actual management. Table 2.2 is a typology of participation that shows the possible range of participation in coastal zone management.

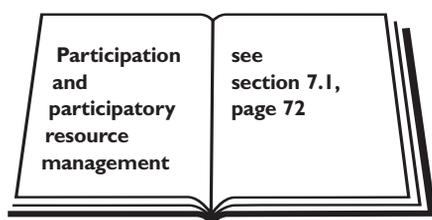
Table 2.2 A typology of participation in coastal zone management

Forms of participation	Characteristics of each type of participation
Passive participation	People are told what is going to happen or has already happened. The administration or project management makes announcements without the mechanisms to respond to suggestions. The information shared belongs to management.
Participation in information giving	People participate by answering questions posed by project management using questionnaire surveys or similar approaches. No opportunity for stakeholders to influence proceedings exists, as the findings of the research or project design are neither shared nor checked for accuracy.
Participation by consultation	Stakeholders are consulted and external agents listen to the views expressed. These external agents define both problems and solutions and may modify these in light of stakeholders' responses. Consultative processes do not offer any share in decision-making and project managers or administrators are under no obligation to take views on board.
Participation for material incentives	People participate in return for food, cash or other material incentives. This is called participation, yet those involved have no stake in prolonging activities when the incentives end.
Functional participation	People participate by forming groups to meet pre-determined objectives related to the project, often involving the development or promotion of externally-initiated social change. Such involvement does not tend to be at early stages of project cycles or planning, but rather after major decisions have been made. These institutions tend to be dependent on external assistance, but may become independent in time.
Interactive participation	People participate in joint analysis that leads to the creation of new local groups or the strengthening of existing ones. These groups take control over local decisions so that people have a stake in maintaining structures or practices. It tends to involve interdisciplinary methods, and systematic and structured learning processes.
Self-mobilisation/ active participation	People participate by taking initiatives independent of external institutions to change systems. Such self initiated mobilisation and collective action may or may not challenge existing distributions of land or assets and power.

Source: Pimbert, M.P. and J.N. Pretty (1994), *Participation, People and the Management of National Parks and Protected Areas: Past Failures and Future Promise*. United Nations Research Institute for Social Development, IIED & WWF

The level of participation depends on the degree of control decision-makers hold over the resource in question, and the amount of decision-making power they are willing to give up. These factors affect how the decision makers perceive the affected community or population, either as a threat to the success of a decision, or as possible owners of the decision, or co-managers of a resource.

In general, participatory approaches to resource management involve engaging stakeholders (see below), or those affected by decisions, and getting them involved in the management process. Evidence suggests that community-based resource management, or participatory resource management can increase the chances of effective resource management. If communities or important stakeholders are committed to making a community based resource management programme work, it stands more chance of success than if it were not supported. Participatory resource management can be undertaken in any number of ways. These guidelines focus specifically on the potential for community-based resource management and co-management regimes.



2.8. Stakeholders

A stakeholder is a person, organisation or group with interests in an issue or particular natural resource. Stakeholders are both the people with power to control the use of the resources as well as those with no influence, but whose livelihoods are affected by changing use of resources.

Stakeholders vary in the degree of influence and importance they have, and they can be broadly categorised according to whether they have relatively more or less influence or importance to the success of coastal zone management.

- **Primary stakeholders** have low influence over the outcomes of decisions, but their welfare is important to the decision-makers. Often, the primary stakeholders are those who stand to lose the most from a decision - although this is not always the case.
- **Secondary stakeholders** can influence decisions being made because they are predominantly decision-makers and those engaged in implementing decisions. They are relatively unimportant, as their welfare is not a priority.

- **External stakeholders** are those individuals or groups who can exert an influence over the outcome of a process through lobbying the decision makers, but whose interests are not important; church groups, or NGO's might fall into this category.

2.9. Stakeholder analysis

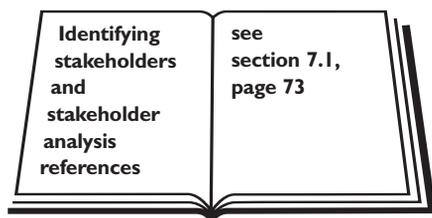
Stakeholder analysis

Stakeholder analysis is a system for collecting information about groups or individuals who are affected by decisions, categorising that information, and explaining the possible conflicts that may exist between important groups, and areas where trade-offs may be possible. It can be undertaken simply to identify stakeholders, or to explore opportunities for getting groups or individuals to work together.

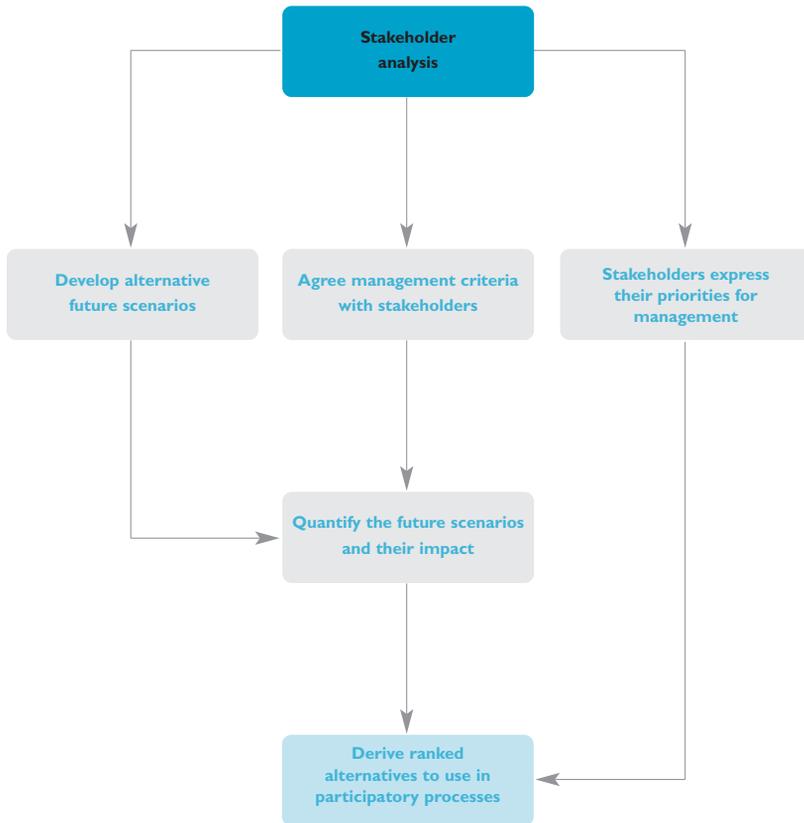
Stakeholder groups are often described by socio-economic classifications such as income level, occupational group and employment status, or by degree of formal involvement in the decision-making processes, degree of group cohesion, formal or informal structures.

Stakeholder identification is complicated by the fact that stakeholders tend to fall into more than one category. Finding the right balance of stakeholders and interests is very important to the trade-off analysis process. Yet ensuring that the right balance is found and maintained during the process is difficult.

 Engaging stakeholders - Chapter 3



C H A P T E R 3
Getting Started: Engaging with Stakeholders



Getting Started:
Engaging with
Stakeholders

Stakeholder analysis

Multi-criteria analysis

Participatory consensus building

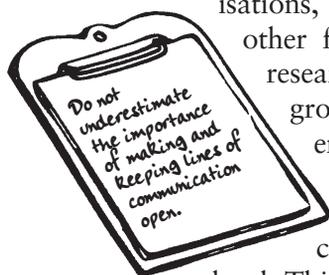
Topics covered

- Identifying stakeholders
- Categorising stakeholders into priority groups
- Who to include in participatory processes
- Building trust in participatory processes
- Engagement techniques

3.1. Identifying stakeholders

Identifying stakeholders marks the beginning of the formal stakeholder analysis process, and it is the first step towards successful conflict management and consensus building. Prior to any field work and information seeking, researchers need to introduce themselves to the resource managers and any other authorities engaged in resource management. These sources should offer advice on any official or unofficial permission needed, and other people or organisations that need to be informed about the research. Other departments may also be able to suggest literature that takes a different perspective on the management issue. Making good contacts initially is important for later stages of the project, especially in terms of building trust.

Good sources of information are the country's national Laws and Regulations, reports produced by the in-house resource managers or local research agencies, and studies by regional agencies, or NGO's. Other places to search for information include, although not exclusively, external aid/development/conservation agencies who have worked in the area, Government departments, NGO's, para-statal organisations, community based organisations, trade organisations and other formal organisations who work or live in the area being researched. The search should unearth a range of individuals and groups who may or may not turn out to be important or influential stakeholders.



One method for identifying stakeholders is to use a continuum of stakeholders from the macro to the micro level. This typology is general and so can be applied to other natural resources, and to a variety of settings (see Table 3.1). It is a useful reminder about stakeholders at different levels who may be important to the decision makers, or who are influential over the outcome of the decision.

Table 3.1 Typology of resource stakeholders on a macro to micro continuum

Continuum level	Resource stakeholders
Macro level	Global and international wider society
	National
	Regional
	Local off-site
Micro level	Local on-site

Source: Grimble, R.J., J. Aglionby, and J. Quan (1994) *Tree Resources and Environmental Policy: A Stakeholder Approach*. *NRI Socio-economic Series 7*. Natural Resources Institute, Greenwich, UK

Stakeholder identification is relevant only for the project or programme under consideration. Stakeholders identified for one project are not necessarily important to another project, unless the project objectives and the management area are the same. Stakeholders change over time, therefore stakeholders previously identified must be reconsidered rather than immediately assumed relevant.

Example 3.1 Buccoo Reef Marine Park (BRMP) stakeholders and their interests

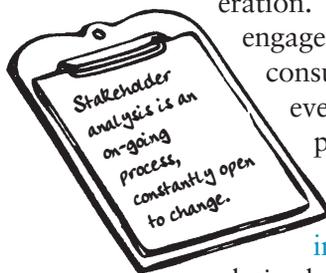
Table 3.2 Buccoo Reef Marine Park (BRMP) stakeholders and their interests

Continuum level	Stakeholder groups	Interest in Buccoo Reef
Global and international wider society	European Union	Funding infrastructure developments
	World Bank	Tying loans to compliance with international treaties
National	Town & Country Planning	Granting planning permissions
	Ministry of Finance	Funding Govt. projects
	Ministry of Tourism	Developing coastal tourism
	Ministry of Marine Resources and Fisheries	Developing coastal zone management strategies
Regional	Tobago House of Assembly	Planning and decision making
	Water & Sewage Authority (WASA) Tobago	Water and sewage treatment
	National Housing Authority	Managing housing estates
Local off-site	Buccoo Villagers	Residents adjacent to BRMP
	Bon Accord/Canaan and Mt Pleasant Villagers	Residents inputting waste indirectly to BRMP
	Mt Pleasant Credit Union	Managing sewage plant for Bon Accord/Canaan
	Hoteliers/restauranteurs	Waste run-off into the sea
	Taxi drivers	Taking tourists to Buccoo Reef
	Informal vendors	Selling marine shells to tourists
	Local land owners not resident on their land	Valuable land for sale to hotel developers or other developers
Local on-site	Reef tour operators	Taking tourists to Buccoo Reef
	Reef patrol (local Govt.)	Monitoring activity in BRMP
	Illegal fishers	Extractive fishing within BRMP
	Illegal souvenir collectors	Extraction of shells from BRMP
	Legal fishermen	Access to fish landing site from fishing grounds
	Watersports operators	Water-skiing/jet-skiing
	Tourists	Enjoying their visit to BRMP

3.2. Categorising stakeholders into priority groups

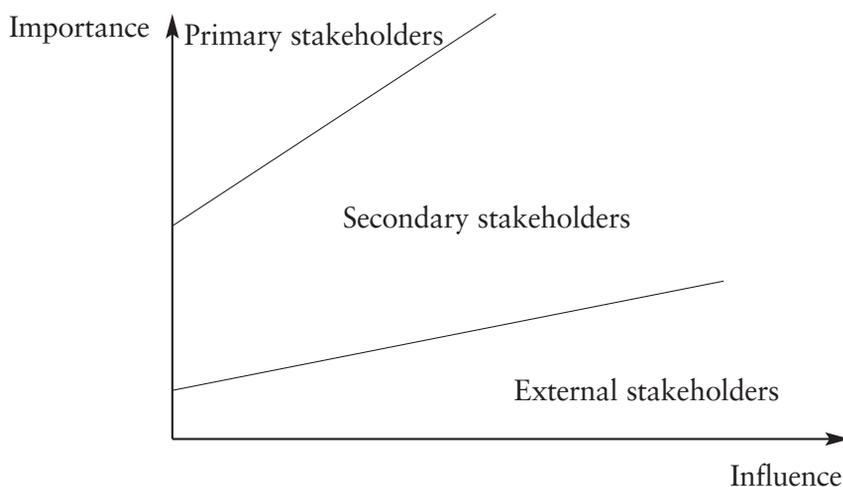
Prioritising stakeholders ensures that the project works with the most important stakeholders (the primary stakeholders). Once classified into **primary**, **secondary** and **external stakeholders**, the primary stakeholders need to be contacted to introduce them to the research process, to ask them if they are willing to become involved in it, and to collect more information about them and other stakeholders. The secondary and external stakeholders need to be contacted and informed about the research process. This Chapter describes the methods for prioritising, determining which groups to include or exclude, trust building, making contact, and engagement techniques.

At this stage there is likely to be a long list of possible stakeholders under consideration. This list needs to be prioritised to identify those who will be engaged actively in the trade-off analysis process, those who will be consulted, and those who will be kept informed of actions or events. In other words stakeholders need to be grouped into primary, secondary and external stakeholders.



Stakeholders can be categorised according to their level of **influence** and their **importance** to the decision-makers. The relative levels of influence and importance determines whether a stakeholder is a primary, secondary or external stakeholder.

Figure 3.1 The relative importance and influence of the different stakeholder groups



Notes:

Primary stakeholders have high importance to the process. They frequently perceive themselves as having low influence.

Secondary stakeholders can be both important and influential, they may be directly involved in the process, and are integral to success. They can in some circumstances be highly influential (for example, government implementing agencies).

External stakeholders can also be influential but tend to have low importance for particular coastal zone management activities. External stakeholders can be influential to outcomes.

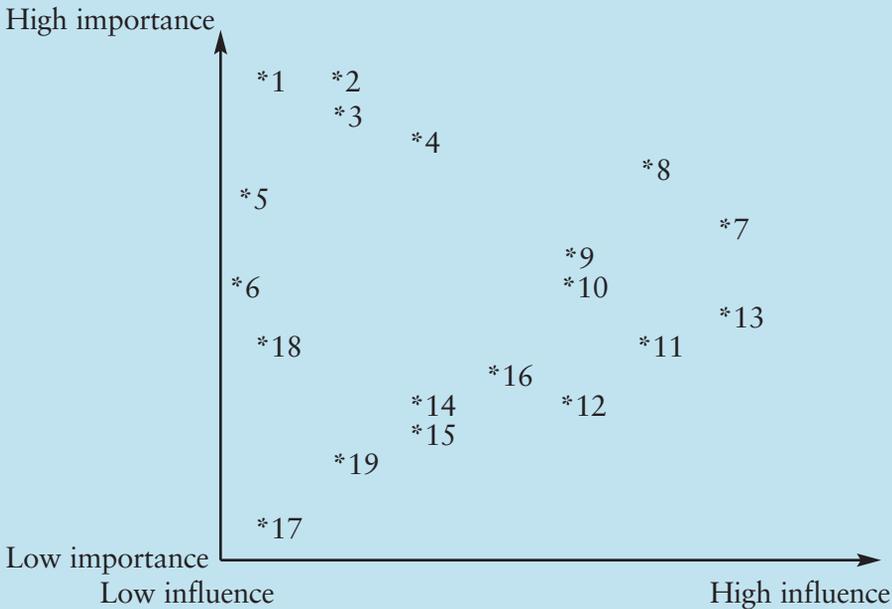
Importance refers to the degree to which the stakeholder is considered a focus of a decision to be made. For example, if the decision-makers are implementing a resource management project designed solely to improve the livelihoods of the poor, the poor who use the resource directly and indirectly would be the most important stakeholders. If, on the other hand, a resource management project was developed solely to conserve the environment for the use of future generations, then resource managers, resource owners and conservation agencies would be the most important stakeholders. Importance varies according to the objectives of the decision-makers.

Influence refers to the level of power a stakeholder has to control the outcome of a decision. Influence is dictated by stakeholders' control of, or access to, power and resources. Influential stakeholders, such as well-established lobbying groups, wealthy land owners, or respected religious leaders, often are already engaged in the decision-making process as they have access to it.

Influence is not the same as importance. For example, a government Ministry of Finance is clearly highly influential in alleviating poverty, but it is the poor themselves who are the most important stakeholder group in this activity. Importance is usually determined by the policy makers. Influence can be determined by the stakeholders themselves, or through assessment of independent reports on the stakeholder groups' access to power and resources.

Example 3.2 Stakeholders' relative influence and importance to the development of the Buccoo Reef Marine Park

Figure 3.2 Stakeholders' relative influence and importance to the development of the Buccoo Reef Marine Park



Primary stakeholders

1. Reef tour operators
2. Local communities
3. Local recreational users
4. Tourists
5. Watersports Operators
6. Catch/release fishers

Secondary stakeholders

7. Town & Country Planning, Trinidad
8. THA/Marine park regulators/IMA
9. Division of Tourism (TOBAGO)
10. NHA/WASA

External stakeholders

11. Hoteliers N of BRMP
12. Formal & Informal business sector
13. Land developers
14. Yachties
15. Ground handlers
16. EMA
17. TIDCO
18. Environment TOBAGO
19. Taxi Drivers

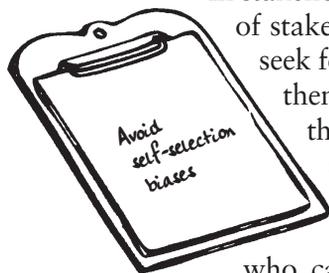
3.3. Who to include in the participatory process?

Once the stakeholders have been categorised, it is possible to identify which stakeholders should be included in the process, who should be consulted, and who should be kept informed.

When the beneficiaries of a decision are not clearly grouped, such as the poor, or the landless it is hard to identify specific stakeholder groups. In such situations, groups that contain target individuals should be included in the primary stakeholder category even though they may not be categorised as such in the classification exercise. An example of this would be legalised squatters living on beach-front land, who own their own dwelling, even though it may be only one room. An initial analysis might suggest that they should be grouped with landowners or sitting tenants and hence classified as external stakeholders. However, the legalised squatters are unlikely to have access to resources and power, and so should not be grouped with the landowners. Careful consideration of the range of members of stakeholder groups is necessary to avoid misclassification of stakeholders, and hence exclusion of important groups.

Self-exclusion by stakeholders themselves should be avoided. Groups who perceive that they may lose, rightly or wrongly, from the process may not feel inclined to engage at all (see Example 3.3). If a primary stakeholder group is resistant to engage, the project must exhibit perseverance and some creativity to keep that group interested, engaged and participating in the process. Even if a primary stakeholder group will not engage immediately, the researcher must continue to invite them to participate.

The project also has to be aware of self-selection by external groups wishing to influence the deliberation process. Groups who are likely to benefit from biasing the decision-making process are likely to request to be included. The project has to ensure that their inclusion will not jeopardise the critical confidence building process that is important to generating an active and confident group.



In stakeholder processes it is difficult to ensure that the correct balance of stakeholders occurs. The most important means is to constantly seek feedback. Once together as a group, the primary stakeholders themselves can decide who can be invited to join their group. At the outset of the process, despite their desire to participate, external stakeholders should not be included. External stakeholders tend to be more vocal, more powerful and often perceived as more senior to the primary stakeholders, who can be intimidated by their presence. Their presence may inhibit discussion and open revelation of preferences and can jeopardise the possibility of all stakeholders working together at a later stage. External stakeholders should be informed of the on-going process and kept up to date with actions and events.

The secondary stakeholders, who are predominantly the managers of the resource, and/or the decision-makers, should be included throughout the process but they should not be allowed to dominate combined stakeholder group meetings. In those meetings primary and secondary stakeholders must be treated equally and given equal time to talk. Managing the secondary stakeholders in the combined stakeholder meetings requires careful diplomacy.

Example 3.3 The self-exclusion of the Buccoo Reef Tour Operators

A video of the coral reef destruction at Buccoo Reef, made by a local non-governmental organisation (NGO), suggested that the main cause of the destruction was the actions of reef tour operators who take tourists to walk on the reef in rubber boots. The video was shown throughout Trinidad and Tobago and as a result the news media condemned the reef tour operators for destroying the reef. The operators were not given the opportunity to put forward their case, that they affected only a tiny part of the reef by their activity, and that other factors, most notably run-off from the land seemed to be causing more serious problems at Buccoo.

As a result of the video, the reef tour operators felt that they were being painted as villains by conservationists, NGO's and government. When the project invited the reef tour operators to the meetings, they were initially reluctant to come along to multi-group meetings as they felt that they would be criticised, in their mind unfairly, for their actions. As the reef tour operators are clearly primary stakeholders, central to the decisions of management of Buccoo Reef Marine Park, they were invited repeatedly. The first meeting with them was arranged through the Buccoo Reef Tour Operators' Co-Operative. Gradually, through continual invitation to single stakeholder group meetings, and by building trust they became more involved in the process.

3.4. Building trust in participatory processes

None of the stakeholders are obliged to participate in the process. Stakeholders may have been asked to engage in previous participatory research projects by other researchers, the government, or NGO's. New projects may be perceived as beneficial, or a waste of time. The researchers have to find methods to build trust between themselves and the stakeholders and to build confidence in the process that they are implementing to generate a willingness to participate. If this can be achieved, there is likely to be greater success in the trade-off process.

Building trust between individuals or groups is a complex process, but begins with honesty and a willingness to share. The researchers must be truthful about their objectives, their source of funding, and what outcomes the stakeholders could realistically expect from the process. They must be willing to share information,

expertise and time with the stakeholder group. It is the responsibility of the researcher to describe to the stakeholders what benefits they could expect from their participation in the process, and from building a relationship of trust with the researchers.

The researcher must be willing to commit to the relationship before they can expect the stakeholders to commit to participate. One method of showing commitment is to provide information that affects the environment in which the stakeholders live or work but is mostly inaccessible to the stakeholders, as it is either too complex, or too difficult to obtain. For example, water quality data for an adjacent coastal area, which is often recorded in scientific units, could be translated into units (such as variation from the World Health Organisations safe standards) that a lay-person could understand. This information could then be disseminated at a public meeting or through flyers directly to stakeholders' houses or meeting areas.



Building stakeholders' trust in the process is a practical issue, but one that must not be overlooked. Stakeholders are unlikely to provide input into a process that they feel will not bring about change. Therefore it is critical that the manager of the resource agrees to engage in the process, and appears at the meetings with the stakeholders and verbally supports the process. Without the support of the decision-makers stakeholders are unlikely to have faith in the process or the research team. Trust building should continue throughout the stakeholder analysis. The initial period of sharing information by the research team will be time consuming.

Example 3.4 Building trust with the people of Buccoo

A presentation was planned on Buccoo Reef water quality (which was a topical issue, it had been in the local newspapers in the weeks before the presentation), and the impact of tourism on the reef. The research team was aware of the difficulty in obtaining information, and thought that stakeholders who may have provided information to other research groups may be interested in the results of previous research, particularly research which had left no easily accessible public record of their findings.

Formal letters of invitation were sent to stakeholders for whom the research team had contact addresses (including government agencies). The invitations described the research team and the project and invited the individual and their stakeholder group to attend the meeting. Public announcements were made on the local radio station, and small flyers were handed out at the central market on a Saturday morning, and in the local villages adjacent to Buccoo Reef.

The meeting was scheduled for a night that did not clash with either government community meetings, or the village councils' meetings. The presentation was held in the evening to enable maximum attendance. The presentation was chaired by the Manager of the Marine Park and was supported by various government officials. All these factors contributed to a high turn out on the night.

One page presentation summaries were distributed which included contact information. Interested parties were encouraged to ask directly for more information at the presentation.

A broad selection of stakeholders attended. Those present were asked if they could be contacted again to attend similar meetings, or to engage in further discussions about Buccoo Reef, they were also asked to inform the speakers of any other people who would be interested in such events, or in the management of Buccoo Reef.

3.5. Engagement techniques

The research team needs to meet with the **primary stakeholders** to elicit their perceptions of management priorities, and to determine their willingness to become part of the management solution. **Secondary stakeholders** need to be consulted on actions, and **external stakeholders** need to be kept informed about the process. A range of engagement techniques are available to the researcher. Engagement options depend on the nature of the group (see Table 3.3).

Table 3.3 Suggested methods of engaging different types of stakeholder groups

Type of stakeholder group	Example of group	Method of engagement
Cohesive organisation with formal structure	Village council	Focus group
Cohesive organisation without formal structure	Informal trade group	Focus group
Mobile individuals, time-limited	Tourists	Questionnaire
Mobile individuals, frequent users	Informal sector workers	Individual interviews
Leaders of hierarchical organisations	Policy makers	Individual interviews
Workers within hierarchical organisations	Government departments	Structured group interviews



A variety of approaches are needed to engage stakeholders. Where organisations already exist and where the stakeholders are well known to each other and meet regularly, it is possible to hold **focus groups**, where certain issues can be discussed in carefully moderated meetings. However, with certain groups, particularly government agencies, where hierarchies exist, and power relationships are sensitive, the researcher may find that it is best to interview the managers of these organisations separately from the key staff in lower offices.

 Chapter 2, section 2.8 on focus groups

Not all groups have cohesive organisational structures with an obvious contact and a key spokesperson. If a group does exist, however loosely, they should be brought together in a focus group forum, as this provides the most carefully managed environment in which to elicit information and build trust.

Some stakeholders are linked informally but do not belong to any organisation or group. In this case, it is often very difficult to find a contact person, and all stakeholders in that group need to be approached individually and invited to attend a meeting to discuss the management issues. This can be a time-consuming process, but it ensures that those most disenfranchised and voiceless are given the opportunity to participate. There will be individuals who feel that, because they are illiterate or innumerate, they are not able to participate. These individuals should be encouraged to participate along with the others. All participants must be treated with equal respect, irrespective of their education, or academic qualifications.

If a group is unwilling to meet together at the outset, possibly because of conflicts within the group, there are alternative methods of eliciting their opinions, such as through individual interviews. Other groups, such as tourists, are unlikely to want to attend a meeting on their holiday. For these time-limited stakeholders, a questionnaire type study is the most effective way of ensuring their participation in the process.

It is recommended that all meetings take place:

1. at a date, time and location suitable to the group - not the researcher,
2. with 4-10 people from the same stakeholder group,
3. with some refreshments if the meeting lasts more than one hour.

The time, date and location are important issues, and careful consideration should be given to them.

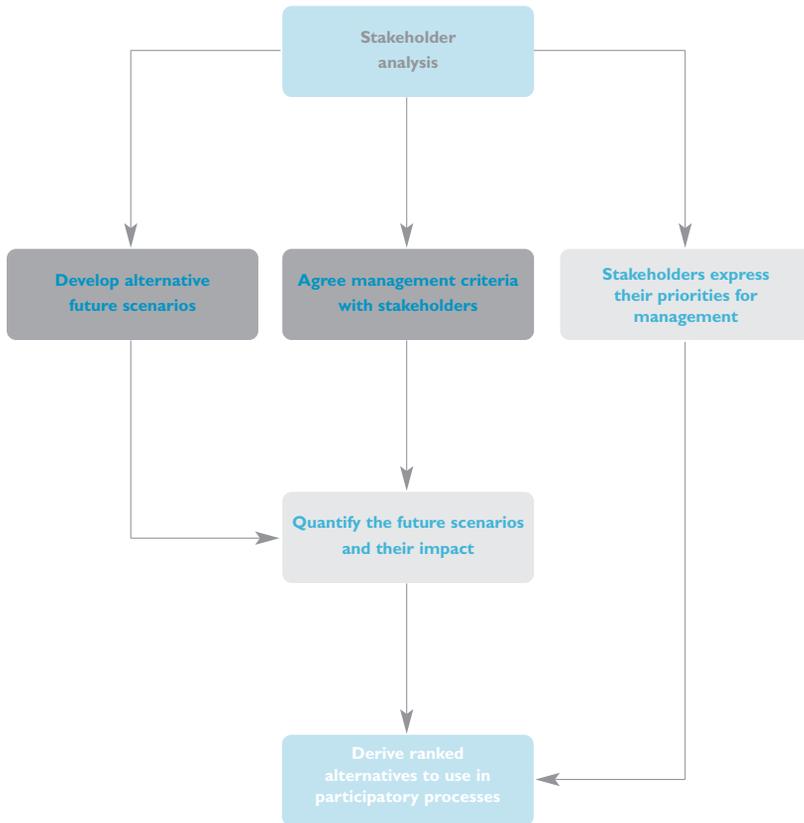
Example 3.5 Getting the Buccoo Reef Tour Operators to attend a meeting

The reef tour operators were an unusual group, in that a co-operative existed - the Buccoo Reef Tour Operators' Co-Operative. The purpose of the co-operative was to enable the reef tour operators to meet to discuss common issues. A dispute had previously developed between the members over where to base the central collection and drop off point for the reef tour. Half the group departed from Buccoo and half from Store Bay, each half aligned their preferences to the location that would maximise their own financial benefit. As a result of this rift the group rarely met, when they did, the dispute over the central collection point would dominate discussions.

Each individual member of the reef tour operators was approached separately and invited. After making initial contact with reef tour operators from Buccoo and from Store Bay further encounters were arranged to discuss the possible gains from their attendance and participation in a series of meetings. After three or four visits to each reef tour operator and a reminder to each on the day of the first meeting, fifteen operators attended the first stakeholder meeting. Even though this was a relatively large number for the focus groups (other stakeholder groups were restricted to 8-10 people), the researchers were reluctant to turn anyone away as it was felt that some would not come back after the first meeting.

C H A P T E R 4

Quantifying future scenarios and impacts



Quantifying future scenarios and impacts

Stakeholder analysis

Multi-criteria analysis

Participatory consensus building

Topics covered

- Doing the ground work for multi-criteria analysis
- Designing and describing possible alternative future development scenarios
- Choosing between alternative future development scenarios
- Selecting management criteria
- Collecting and compiling information for use in multi-criteria analysis
- Using an Effects Table to organise and display information

4.1 Designing alternative future development scenarios

Where management plans or strategies for the coastal zone already exist, these are the best sources of information to develop alternative future **development scenarios**. These plans may have been generated by the government, research institutes, developers, or academics. In most countries, governments undertake development planning, whereby they make short term, medium term, or roll-over financial plans, or at least some type of draft economic development plans. Such development plans indicate the planned areas for economic growth, planned areas of expansion, and areas where government is willing to target spending.

Where development plans or very specific management plans have already been developed, the range of alternative **scenarios** may still need to be explored. Development plans can give a very clear idea of the type of development strategy a country is following. However, this information has to be read and understood in light of actual actions that the government is taking. For example, if the government states that it is placing a moratorium on new hotel developments and then allocates planning permission for a new hotel development, this might be a case where actions speak louder than words. The possibility of inaction, or a ‘do nothing’ scenario also needs to be considered. It is often the case that no action is taken where a decision is considered politically difficult. Such inaction creates outcomes that need to be evaluated.



In a few cases development plans will not exist. Here, the researcher must piece together pictures of development options from various signals. Sources include: the annual budget, the Budget speech, planning guidelines from the town planning department, economic survey reports, laws and regulations developed and implemented by the environment department or environmental management agency, reports or public statements from any quasi-governmental research institutes or think-tanks, reports prepared by external aid, research or development agencies. It may be that the absence of any references to a specific topic is interesting, and a policy statement in itself. For example, a lack of references to improved sewage treatment might imply, in a country where there is no sewage treatment to tertiary level, that sewage treatment conditions may remain the same for at least the next 5-10 years.

The people who make management decisions must guide the definition of the management strategies. Key informants from government should verify the reality of management strategies.

Example 4.1 Developing management scenarios for Buccoo Reef Marine Park

Desk research combined with discussions with members of various departments within the Tobago House of Assembly (the local government agency) revealed that two issues (the level of environmental management, and the level of tourism development) were the most important driving forces that could affect Tobago's development in the short term and medium term.

The Tobago House of Assembly commissioned the development of a Fifteen Year Development Plan for Tobago. Various developmental actions were promoted within this plan including an economic expansion rate of 10-15% per annum. The plan recommended that this growth be generated through tourism development. One scenario had to therefore reflect a very rapid increase in visitor expenditure in Tobago (it was assumed that this would come through increased arrivals), another should reflect what would happen if growth remained as it was, reflecting 'with' and 'without' policy intervention.

Given the potential growth in the economy in Tobago, it was assumed that waste produced from tourism would also grow. A range of waste management systems had been considered by WASA (Trinidad and Tobago's Water and Sewerage Authority). These systems included a central waste management system that would be very expensive initially, but could significantly upgrade the present waste treatment facilities. The other options included developing regional waste treatment stations, or leaving existing 'soakaway' systems in place. One scenario therefore had to reflect possible improvements in waste treatment, and another had to reflect a no-change scenario.

Tourism development and environmental management therefore were selected as the two drivers that informed the shape of the alternative future development scenarios. Each driver was estimated under 'no change', and realistic change (as defined by the Water and Sewage Authority for environmental management, and the Fifteen Year Development Plan, for economic growth).

4.2 Clarifying the alternative future development scenarios

The descriptions of the alternative future development scenarios should be as detailed as possible, in addition they should be:

1. Understandable to the layperson.
2. Distinct from each other.
3. Possible and realistic.
4. Clear.
5. Substantiated by existing information, if possible.



The alternative scenarios can be described in either quantitative or qualitative terms. The description used will depend on the type and quantity of data available, and also on the skills of the researcher.

A word of caution

It is advised that those who undertake this work follow known and respected methods of statistical estimation and projection. This will provide credence to quantitative values, and will provide the researcher with a solid base on which to argue the validity of the data.

Many statistical textbooks exist which describe time-series data projection and forecasting. As a word of caution the researcher should use techniques they are most comfortable with, and not attempt techniques that they are uncertain of, or unable to defend. The scenarios only need to describe broad trends.

Example 4.2 Clarifying the alternative future scenarios for Buccoo Reef Marine Park

Four future scenarios for south-west Tobago were developed describing different levels of tourism development and environmental management. Tourism growth could continue along its current development path or it could be influenced by Government policy and promoted more actively. The environment could be managed as at present, or the Government could engage in more active environmental management. The scenarios were:

- A: Limited tourism development without enhanced environmental management**
- B: Limited tourism development with enhanced environmental management**
- C: Expansive tourism development without enhanced environmental management**
- D: Expansive tourism development with enhanced environmental management**

Indicators for tourism development include visitor expenditure, visitor arrivals, occupancy rates, number of tourist accommodation beds. The number of tourist beds was selected as the best indicator for tourism development as the number of tourism beds can be directly measured, whereas other indicators such as visitor arrivals were unknown (no data is collected on visitor numbers to Tobago alone). In addition, number of beds could be directly related to the level of employment, and visitor expenditure could be extrapolated from it. Indirectly the level of waste water produced by each tourist could be estimated.

The main environmental impact was described by the percentage of waste treated to tertiary level, and the volume of waste produced. Waste water was produced by both tourists and residents, so any increase in either population would impact on environmental quality (see Table 4.1).

Table 4.1 Scenarios for Buccoo Reef Marine Park and the driving forces of change

Scenario	New tourist beds in BRMP area*	Population in BRMP area*	Percentage waste treated
A: Limited tourism development without enhanced environmental management	240	6900	9
B: Limited tourism development with enhanced environmental management	240	6900	49
C: Expansive tourism development without enhanced environmental management	1580	7400	18
D: Expansive tourism development with enhanced environmental management	1580	7400	69

Note:
* BRMP area is the watershed area for the Buccoo Reef Marine Park.

The future scenarios use a 10 year time frame as this time period reflects changes that might occur from developments in the tourism sector and in the area of environmental management that are already planned. This information was then interpreted and it was possible to paint a picture of how Tobago might look in 2007 under the different scenarios.

4.3 How to choose between alternative future scenarios?

Alternative future coastal zone management scenarios are likely to have an impact on stakeholder groups. The impacts can generally be split into three groups: economic, socio-cultural, and environmental. Depending on the local situation, other impacts could be very important, such as access to resources, ownership rights, impact of pollution specifically on the elderly or children.

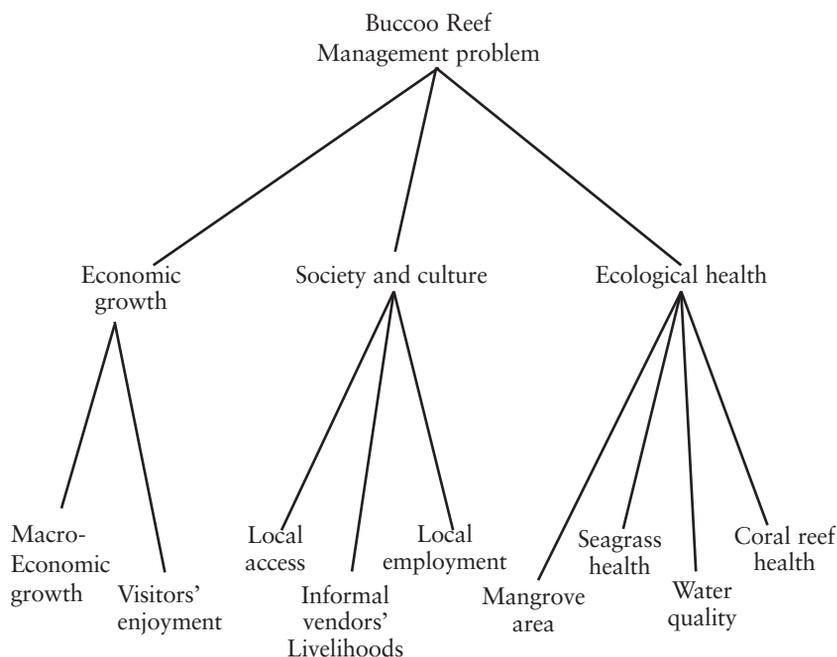
Management criteria, which reflect the impacts of the alternative future scenarios, should be compiled through discussion with both experts and the people affected by the changes - the stakeholders. Various methods exist to engage with the stakeholders in discussions where they can reveal their preferences. Options include: focus groups, informant interviews, structured interviews, open interviews, and open meetings. The most appropriate method for different groups are described in Table 3.5.



For more information on methods to engage stakeholders see section 3.5 ‘Engagement Techniques’ and sections 6.1 and 6.2.

Whichever method is chosen, very clear direction from the researcher is required to ensure that stakeholders have the opportunity to include or exclude as broad a range of management criteria as they feel are important. One way of ensuring that all criteria are considered by stakeholders is to draw a tree diagram (see Figure 4.1). A tree diagram uses a stem and branch system to arrange all the possible impacts from a decision.

Figure 4.1 Tree diagram showing the decision faced at Buccoo Reef and the main issues surrounding the decision



At the apex of the tree, the main issue under consideration is stated, usually management-focussed. On the branches leading from this node are the general issues of concern, such as the economy, society and ecological health (although it should be noted that there could be many others). On the branches leading from these nodes are the more detailed concerns. This exercise should continue until all the issues have been identified.

Nodes

A node is a point intersected by two or more branches (usually of a tree diagram).



All stakeholders need to be involved in the criteria selection. Local residents may not be aware of the important and complex environmental impacts of certain developments or the economic or social consequences. Therefore, specialists within individual government agencies should also have the opportunity to suggest additional criterion.

Example 4.3 Engaging the Buccoo Reef Stakeholders: the first meeting

Each Buccoo Reef primary stakeholder group was invited to attend a meeting with the research team. Informal contact had already been made with the groups and the first meeting was to be both sharing and extractive, therefore it combined formal presentations to disseminate information with participatory approaches to elicit stakeholders' perceptions and preferences.

The meeting took the form of several short presentations about Buccoo Reef interspersed with discussions led by the moderator using previously developed questions. At the end of the meeting the notes from the meeting were read back to the stakeholders who were asked to verbally confirm that the notes reflected their thoughts and concerns. If the notes were not accurate, the stakeholders were asked to help the note taker correct them. Reading back the notes to the stakeholders is an essential part of the process.

The meeting commenced with a short presentation by the researchers on how Tobago might look in ten years (based on the four future development scenarios). The stakeholders were then asked if they had any concerns about the possible impacts of the scenarios on their lives. The ensuing discussions were led by a moderator. An assistant moderator recorded the proceedings and a separate 'expert witness' was available to answer technical questions that arose. The discussions uncovered the issues that the stakeholders felt most strongly about. Towards the end of the discussions the stakeholders were asked what they would do if they were the Prime Minister of Trinidad and Tobago for one day, and they could change one problem area. The responses from each of the stakeholders were later used to re-confirm the issues raised during the discussions by participants. A copy of the moderators' notes used to direct discussions in the first round meetings are contained in Appendix 1.

During the breaks, informal discussions provided opportunities to discuss with the stakeholders some of their general concerns about Tobago and the changing nature of the island. The informal conversation and relaxed atmosphere helped build bridges between the researchers and the stakeholders.

The stakeholder meetings also contributed to other objectives, not least by further encouraging the stakeholders to verbalise their interests and concerns in a supportive environment, and to provide a forum for trust building.

4.4 Selecting management criteria

A quick method of reducing the number of criteria is to list all the criteria suggested by the stakeholders and experts and then to apply the following five conditions to each.

1. **Is the list complete?** Do the issues identified describe all the main issues of concern to the decision maker, or the primary stakeholders?
2. **Is the list operational?** Are all of the issues identified specific enough for the decision maker to evaluate and compare the different scenarios? The criteria do not need to describe the exact interaction of each system component, they only need to reflect general changes in the economic, social or ecological systems as a result of the alternative management decisions. The information is ultimately used by planners, and too much detail can be as confusing to non-scientists as too little detail.
3. **Has double counting occurred?** Can the performance of each management criterion under the different development scenarios be judged independently from the other criteria (to avoid double-counting)?
4. **Do the criteria vary under the scenarios?** Have criteria which do not vary under the different scenarios been eliminated? There is no point using criteria that do not vary across the scenarios, gathering the data to measure them is a waste of the researchers time and resources.
5. **Has the list been kept to a minimum size?** Have the criteria been kept to the smallest number to reduce costs of the exercise? For each criterion data need to be collected, and they add complexity to the multi-criteria analysis. The time limitations faced by the researcher should determine how many criteria are used. In general eight to fifteen criteria should be adequate for most problems, although the fewer, more concise criteria - the better.

This first fine-tuning of the criteria should remove many of the duplicated criteria. The issue of measurability is also important, and should be thought through carefully. Measurability refers to the ability to measure a criterion reasonably accurately. There is no hard and fast rule to determine this. If a researcher feels that a criterion cannot be represented by a suitable measure, the criterion should be dropped. Measurability does not require quantitative measurement, qualitative data and ranking can also be used.



Data on the impacts of the possible alternative future scenarios are always scarce. The most important action before data collection is to plan how much data you need, where to find the data, and how much it will cost to collect or collate it. Important considerations in data collection are:

1. How detailed does the information have to be to answer the questions you are asking?
2. Do you understand the relationship between the criteria and scenarios? For example, what is the impact of one additional tourist on coastal water quality? If you do not know this, do you know where to find the information that will describe the relationship to you?
3. Do existing sources of this data provide you with adequate information?
4. Do you need to collect original data? If so, how much will the data collection cost (in terms of labour, money and time), and can you afford it? If not, what alternatives exist?
5. Can you undertake the analysis yourself, or will you need to pay someone to assist you?
6. Do you need additional software for your computer to analyse the data?

A good starting point to help think through all these points is to create a table showing the area of interest, sub-criteria, the method to analyse the data, and the means of collecting the data (see Table 4.2). Once completed, answers to some of the other questions should become clearer.

Table 4.2 The type of data to be collected, the method of analysis and the sources of information

Criteria	Sub criteria	Measure/ basis of calculation	Sources of data
Economic criteria	1. Macro-economic benefits of tourism to Trinidad and Tobago	Tourism revenue x economic multiplier x (1-marginal propensity to import)	Secondary data from government statistical sources
	2. Tourist benefits	Consumer surplus of recreational users of BRMP	Primary data collection - contingent valuation survey of visitors and residents
Social criteria	3. Local employment in tourism	Additional full time 'quality' jobs x proportion of jobs to Tobagonians	Continuous Sample of Population (Trinidad and Tobago); Tobago House of Assembly management report on BRMP
	4. Informal sector benefits	Changes in informal sector benefits	Primary data collection - informal business survey
	5. Costs of local access to BRMP	Change in costs of accessing BRMP	Primary data collection - private access costs, public access costs, expert judgement of BRMP manager
Ecological criteria	6. Water quality	Nutrient concentration - nitrate loading and concentration	Secondary data and modelling using scenarios of tourist sector development
	7. Productivity - nursery function of sea grass	unit productivity	Primary data collection using rapid assessment techniques and modelling
	8. Coral reef health	% live coral cover	Primary data collection using rapid assessment techniques and modelling
	9. Mangrove Habitat	% change in area of mangrove (ha)	Historical aerial photographs and projected tourist development

4.5 Compiling information for the multi-criteria analysis

If the researcher plans to collect primary data care must be taken to avoid collecting too much data that will not answer the questions being asked. For this reason, the researcher must know how the data will be used, the method of analysis, and the relationship between the criteria and the scenarios before data collection begins. It is advisable that a period of desk research to develop methods of analysis and to identify secondary data is undertaken before any primary data collection begins.

A word of caution

Beware of hidden costs of primary data collection. You may find that you have estimated the costs of data collection, but forgotten to account for transport for yourself to the point of data collection, for access to the data, for shipment costs for samples, or for an assistant or boat captain.

There is a host of information within governments, on the Internet and from regional or international aid and research organisations, that can be accessed more cheaply than collecting primary data yourself. The list below provides several links to different sources of economic, social and ecological data.

Box 4.1 Internet resources for data collection

International Monetary Fund

By country statistical reports - downloadable pdf files

<http://www.imf.org/external/country/index.htm>

World Bank

By country economic data - also in pdf format

<http://www.worldbank.org/data/countrydata/countrydata.html>

International Labour Organisation

LABORSTA database can be searched by various keywords

<http://laborsta.ilo.org/cgi-bin/broker.exe>

United Nations' Educational, Scientific and Cultural Organisation (UNESCO)

Useful database on education, science, technology, communication and culture by country.

<http://unescostat.unesco.org/en/stats/stats0.htm>

Caribbean Coastal Marine Productivity Programme (CARICOMP)

Database of coastal marine ecology data by country

<http://isis.uwimona.edu.jm/centres/cms/caricomp/>

Food and Agriculture Organisation

Tables created by the user on fish stocks and catch as well as on agricultural and food production

<http://apps.fao.org/>

FishBase - produced by International Centre for Living Aquatic Resource Management (ICLARM)

A global information database on fish
<http://www.cgiar.org/iclarm/fishbase/>

ReefBase - by ICLARM

A global information database on reef ecology
<http://www.cgiar.org/iclarm/reefbase/frame/>

World Conservation Monitoring Centre

Easily accessible marine data
<http://www.wcmc.org.uk/marine/data/>

The Internet can also be a good source of information in methods for collecting and analysing data. An excellent source of information is the National Oceanographic and Atmospheric Administration's 'Coral Health and Monitoring Programme' (CHAMP) web site:

<http://www.coral.noaa.gov/themes/tools.html> This site provides information on selected guidelines, handbooks and other 'tools' for coral reef management and monitoring.

The Caribbean Coastal Marine Productivity Programme, Centre for Marine Sciences, University of the West Indies at Mona, Jamaica (CARICOMP) web site also offers useful guidelines:

<http://isis.uwimona.edu.jm/centres/cms/caricomp>

Sources of information will vary from country to country. Broadly speaking economic indicators are usually available from government statistical offices. Sources of data to describe social criteria may be more difficult to identify. Employment statistics are likely to exist in the central government statistics office, or department of social services. Ecological data may be found at universities, or research institutes, and possibly with a regional environmental agency or NGO.

Example 4.4 Analysing data for Buccoo Reef Marine Park

A wide range of criteria were selected, and so a variety of different methods were used to collect the data. These methods ranged from creating a simple macro-economic model, to undertaking an informal business vendors survey, and to underwater fish counting. Brief descriptions of some of the methods used are described here. If the researcher wanted to replicate the methods they are advised to seek additional information on how to undertake the specific types of analysis relevant to the questions they are asking.

The macro-economic benefits to Tobago from different levels of tourism development and environmental management were estimated using published government data in the formula:

Macro-economic benefits to Tobago = $f \{ \text{no. of beds} \times \text{av. occupancy rate} \times \text{av. daily expenditure per tourist} \times (1 - \text{marginal propensity to import in Tobago}) \}$

Using the number of beds and the average occupancy rate removed the problem of obtaining information on visitor arrivals to Tobago, as that information was unavailable during the study period. The average occupancy rate was determined from the statistics found at the Government's Central Statistical Office, and average visitor expenditure was obtained from estimates from the Caribbean Tourism Organisation. An estimate for the marginal propensity to import was obtained through discussions with staff in the Economics and Statistics Office, THA.

Visitors' willingness to pay for conservation of Buccoo Reef Marine Park was measured through a survey of using the contingent valuation method. Visitors to and residents of south-west Tobago were asked about their willingness to pay to prevent further damage to Buccoo Reef Marine Park and their willingness to pay under changes in environmental quality. From this an estimate of average willingness to pay was calculated under different environmental conditions. A mean estimate was then multiplied by the possible number of visitors and projected under the different scenarios of more or less tourists. The contingent valuation method questionnaire used to collect this data is contained in Appendix 2.

The social impacts of the alternative future scenarios (namely sub-criteria 3, 4 and 5 in Table 4.2) were derived from a variety of sources. Employment was estimated from government statistics - such as the Labour Force Report.

Local access to the coastal areas around Buccoo Reef was estimated through direct interviews with the managers of Buccoo Reef Marine Park. The current costs of access and ease of access were estimated, and changes in the ease of access and the cost of access were assessed under the different scenarios. Increases in access costs were considered a negative impact, as was reduced access.

Changes in informal business vendors' livelihoods were assessed through semi-structured interviews of most of the informal business vendors in the south-west of Tobago. A copy of the questionnaire is contained in Appendix 3. Vendors were asked about their preferences for different types of tourism development, and the impact of different level of environmental quality on their businesses. The responses were coded according to theme and then **scored** using an **ordinal scale**.



For more information on ordinal scales see section 5.3 and Table 5.4 ‘The Four Scales of Measurement’

A word of caution

Please note that this example describes the data collected and analysis that was appropriate for the case study at Buccoo Reef. The researcher has to determine their own data needs and their own methods of data collection and analysis, as these will vary depending on the skills of the researcher and the time available.

4.6 Using an Effects Table to organise and display information

Multi-criteria analysis can show the impact of each of the different scenarios on each of the different management criteria in an ‘Effects Table’. An Effects Table is simply a table with the management scenarios displayed as column headings and the management criteria displayed as row headings. The numbers in the Effects Table describe how the management criteria change under the alternative future scenarios.

Table 4.3 The Effects Table for Buccoo Reef Marine Park

Criteria	Scenario			
	A	B	C	D
Economic				
(1) Economic revenues to Tobago (US\$ m)	9	11	17	19
(2) Visitor enjoyment of BRMP (US\$ m)	1.2	2.5	0.9	1.7
Social				
(3) Local employment (no. jobs)	2,500	2,600	6,400	6,500
(4) Informal sector benefits (score)	5	4	3	2
(5) Local access (score)	6	5	6	7
Ecological				
(6) Water quality ((g N/l)	1.5	1.4	2.2	1.9
(7) Sea grass health (g dry weight/m ²)	18	19	12	15
(8) Coral reef viability (% live stony coral)	19	20	17	18
(9) Mangrove health (ha)	65	73	41	65

Notes: Scenario names explained in Table 4.1

The Effects Table can contain values in different units of measurement, these values are scaled to enable comparison.

 The [scaling](#) process is described in detail in sections 5.3 and 5.4

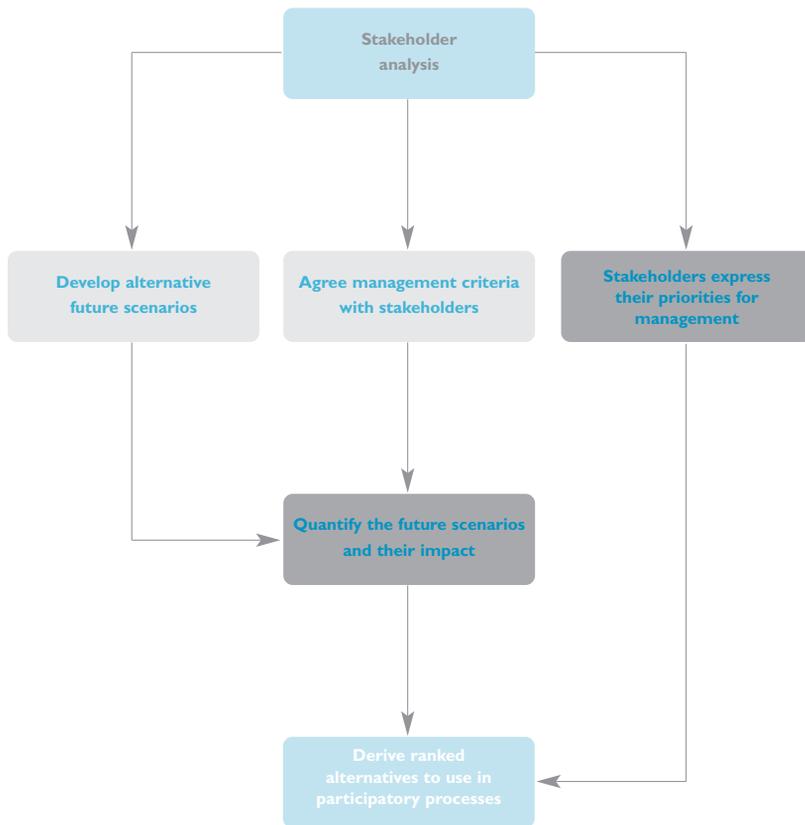
In the example economic criteria are measured in monetary units, social criteria are measured in qualitative [scales](#) and numbers of jobs, and the environmental data are measured in various ways, such as dry weight of sea grasses, and hectares of mangroves. The Effects Table can be set up in a computer spreadsheet (such as Lotus 123, Excel) or in a multi-criteria analysis package (such as DEFINITE or HIVIEW). If the researcher is not comfortable using a computer package, the data can be analysed using the techniques described in detail in Chapter 5. These techniques require the researcher to have an understanding of basic mathematics and statistical operations including mean average and ratios.

 For more information on [multi-criteria analysis](#), see the definition in section 2.7 and Chapter 5.



C H A P T E R 5

Defining ranked outcomes



Defining ranked outcomes

Stakeholder analysis

Multi-criteria analysis

Participatory consensus building

Topics covered

- Using multi-criteria analysis
- Scaling criteria values
- Calculating scores
- Eliciting stakeholders' preferences
- Converting stakeholder preferences into weights
- Ranking management strategies with and without weights

Multi-criteria analysis is most often used to identify a ranking of preferred alternative future scenarios. For the purpose of trade-off analysis, multi-criteria analysis is just one step in the process towards participatory decision-making. Multi-criteria analysis is used specifically to provide a framework within which to display scenario and impact data collected, to rank scenarios from most to least preferred, and to show the effects of including stakeholders preferences (in the form of **weights**).

 For more information on multi-criteria analysis go to section 2.6

The most preferred scenario is the one that achieves the highest score across the criteria. To enable comparison of scenarios across all criteria, the criteria values are converted to scores and stakeholder weights are applied. This can be achieved through the four step process described in this Chapter.

5.1 Scaling criteria values

Before the criteria can be converted into a scale, the researcher must be clear about whether each criterion constitutes an improvement to the situation (a 'benefit') or a loss (a 'cost'). Whether a change is an improvement or a loss ultimately depends on the objectives of the decision-makers. To illustrate, for the criterion 'local access to the coastal zone', if the research were being undertaken for a conservation agency, greater access by local people could be considered a loss as it could be damaging to the resource. Therefore the criteria would be a 'cost' criteria, where higher values reflect a deteriorating situation. If, on the other hand, ensuring local people have access to the coastal zone is an objective of the decision-maker, then if more local people could access the coastal zone this would be preferred. In this case the criterion 'local access' would be a 'benefit' criterion where higher values reflect an improvement.

Once the researcher has determined for each criterion whether a higher or a lower value is preferred, each set of criterion values are scaled from 0 to 100. The least preferred outcome is assigned a value of 0, the most preferred outcome is assigned 100. The values in between (for the same criterion) are ascribed scores relative to

their distance from the upper limit of 100 and the lower limit of 0. Different methods are used to score the values depending on whether the most preferred outcome is the highest value (a ‘benefit’ criteria) or the lowest value (a ‘cost’ criteria).

Example 5.1 Scaling a ‘benefit’ criteria: converting macro economic revenue values to scores

The macro-economic benefits to Tobago were estimated by aggregating the potential net revenues that could accrue from visitor expenditure within Tobago over a 10-year period under the four alternative future scenarios described in sections 4.1 and 4.2. The estimated benefits ranged from US\$9 million, to US\$ 19 million. This information is displayed in the Effects Table - Table 4.3, in section 4.6.

To convert the four values (US\$9 million, US\$11 million, US\$17 million and US\$19 million) into scores, the following method was used. The first step was to assign the score of 100 to the most preferred value, therefore US\$19 million was scored at 100. The next step was to score the least preferred value at 0, therefore US\$9 million scored 0. The middle values (US\$11 million and US\$ 17 million) were converted into scores using the formula:

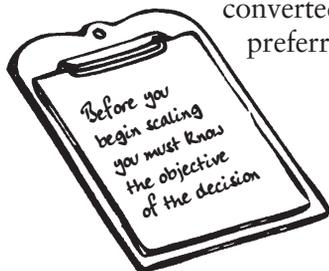
$$X_s = \frac{X - X_{\min}}{X_{\max} - X_{\min}} \times 100$$

where:

- X_s = Scored value
- X = the value being transformed into a score
- X_{\max} = Maximum value (= 19)
- X_{\min} = Minimum value (= 9)

For the macro-economic benefits criterion values (9, 11, 17, and 19), the final scores are therefore: 0, 20, 80 and 100.

In the case of a cost criterion - high values indicate less preferred outcomes and low values are preferred. This is the case in the example below, where the criterion ‘nitrates levels in the coastal waters of the Buccoo Reef Marine Park’ values are converted into scales. Here the scale is drawn such that the most preferred outcome is the lowest value.



Example 5.2 Scaling a 'cost' criterion: converting water quality values to scores

The water quality around the Buccoo Reef Marine Park was estimated from samples taken from twenty marine and freshwater sites around the park. Using estimates of the possible level of water treated to tertiary level (described in the alternative future scenarios in Table 4.1) it was possible to estimate the likely changes in levels of nitrates in coastal waters under the alternative scenarios. The estimated range of values is: 1.4, 1.5, 1.9 and 2.2 mg N l⁻¹. In this range, the highest level of nitrates was 2.2 mg N l⁻¹. From the four values, this was least desirable level of water quality, and hence was assigned a score of 0. The lowest expected level of nitrates was 1.4 mg N l⁻¹, indicating better water quality, and thus scoring 100. The nitrate values in between, 1.5 and 1.9 mg N l⁻¹ were converted into scores using the formula:

$$X_s = \frac{X_{\max} - X}{X_{\max} - X_{\min}} \times 100$$

where:

- X_s = Scored value
- X = the value being transformed into a score
- X_{\max} = Maximum value (= 2.2)
- X_{\min} = Minimum value (= 1.4)

For the water quality criterion values (1.4, 1.5, 1.9 and 2.2) the final scores using this method are therefore: 100, 88, 38 and 0 respectively. See Figure 5.1.

Figure 5.1 Conversion of water quality data from actual values to scores

	Score	Water quality data (mg N l ⁻¹)
Most preferred	100	1.4
	88	1.5
	38	1.9
Least preferred	0	2.2

5.2 Ranking the future development scenarios - not including stakeholders' preferences

Once the criteria values have been converted into scores, the values should be replaced within the Effects Table by the scores. For each criterion the most preferred and least preferred outcomes can clearly be seen, the least preferred outcomes have a 0 value, and the most preferred have a value of 100 (see Table 5.1).

Table 5.1 The Effects Table with scores and equal weights

Criteria	Scenario			
	A	B	C	D
Economic				
(1) Economic revenues to Tobago	0	20	80	100
(2) Visitor enjoyment of BRMP	19	100	0	50
<i>Average Scores</i>	<i>10</i>	<i>60</i>	<i>40</i>	<i>75</i>
Social				
(3) Local employment	0	3	98	100
(4) Informal sector benefits	100	67	33	0
(5) Local access	50	0	50	100
<i>Average scores</i>	<i>50</i>	<i>23</i>	<i>60</i>	<i>67</i>
Ecological				
(6) Water quality	88	100	0	38
(7) Sea grass health	86	100	0	43
(8) Coral reef viability	67	100	0	33
(9) Mangrove health	75	100	0	76
<i>Average scores</i>	<i>79</i>	<i>100</i>	<i>0</i>	<i>48</i>
Overall average scores	46	61	33	63

Notes: Scenario names explained in Table 4.1

If a decision were to be based solely on one criterion, Table 5.1 shows which scenarios would be preferred. For example, if the only important criterion were maximising macro-economic benefits, the most preferred alternative would be Scenario D. However, in terms of minimising nitrates in coastal waters Scenario B would be the preferred scenario.

To identify the future scenario that is most preferred, the impacts of all the criteria have to be taken into account. This is achieved by calculating mean scores for each criteria group, and then taking an average of these scores. This process generates one final score for each scenario, which permits the ranking of the four scenarios. The scenario with the highest overall average score is considered the most preferred, and the scenario with the lowest score, the least preferred. The final preference rankings do not indicate by how much one scenario is preferred to another.

Example 5.3 Identifying the scenario that best maximises benefits and minimises costs for Buccoo Reef Marine Park

Having defined the impacts of each of the scenarios on the criteria in the Effects Table (see Table 4.3), and converted all the criteria values into scores (see Example Boxes 5.1 and 5.2) it was possible to identify the ‘best’ scenario. Best in this case means the scenario where the benefits were maximised, and the costs were minimised. Identifying that scenario involved estimating mean average scores for each of the scenarios.

The mean scores of the main criteria groups (the economic, social and ecological criteria) were calculated by averaging the scores of the **sub-criteria** within each group (see Table 5.1). For example, the mean value for the economic criteria:

under scenario A is: $(0 + 19) / 2 = 10$

under scenario B is: $(20 + 100) / 2 = 60$

under scenario C is: $(80 + 0) / 2 = 40$

under scenario D is: $(100 + 50) / 2 = 75$

This exercise is repeated for the social and ecological criteria to create average scores for each criteria group under each scenario (see Table 5.1)

The averages from the economic, social and ecological criteria should then be averaged again to produce a final overall score. This score will lie between 0 and 100 for each scenario. For example, the overall scores for:

Scenario A is: $(10 + 50 + 79) / 3 = 46$

Scenario B is: $(60 + 23 + 100) / 3 = 61$

Scenario C is: $(40 + 60 + 0) / 3 = 33$

Scenario D is: $(75 + 67 + 48) / 3 = 63$

The most preferred scenario can then be identified from Table 5.1 as the column with the highest overall score in the bottom row. It can be seen that the overall average scores generate the following ranking of scenarios, from most to least preferred: D, B, A, C. The ‘best’ scenario would be Scenario D (with an overall average score of 63).

The close overall average scores for the top ranking Scenario D (score 63) and the second ranking Scenario B (score 61) needs some explanation. The method of averaging the scores generated an **ordinal scale** (for more information see Table 5.2). This means that it cannot be inferred from the overall average scores by how much one scenario is better than another scenario. The only inference that can be made here is that Scenario D is preferred to Scenario B, it is not possible to say by how much.

5.3 Eliciting stakeholders' preferences

When the preferences of the different stakeholder groups are identified and included in the analysis it is possible to see how the ranking of scenarios changes. Stakeholders' preferences for different management priorities can be elicited in various ways (see section 3.5). The method of eliciting information very often determines the format of the information. All information will be collected in one of the following formats: nominal, ordinal, interval or ratio data (see Table 5.2). The different types of information permit different levels and types of analysis.

Table 5.2 The Four Scales of Measurement

Scale	Description	Examples
Nominal	Classifies data into mutually exclusive categories that can be used for identification purposes. It is a naming device only. The information generated cannot be manipulated statistically beyond computation of modal average.	Gender (male/female) Country of residence Occupation User/non-user Social security numbers
Ordinal	Ranks information into ordered groups, where higher group numbers indicate more of the group characteristic. This type of data is more easily manipulated than nominal data. Median and modal averages can be estimated although some statistics cannot be estimated.	Level of education Difficulty level of tests Consumer brand preference
Interval	Ranks information into ordered groups, with equal intervals between groups. There is no absolute zero point. Interval data is a more advanced level of measurement than ordinal data and can be added and subtracted.	Temperature scale Likert scales
Ratio	This is the most advanced form of measurement, and is an interval scale with an absolute zero point. All arithmetic operations are possible and magnitudes can be compared.	Kilograms (weight) Money Probability

Ideally the most descriptive scale of measurement should be used when estimating weights. The **nominal scale** is the least descriptive scale, and the ratio scale is the most descriptive. More descriptive scales permit more accurate comparisons and more detailed conclusions to be drawn. By way of illustration it should be noted that in section 5.2 an ordinal scale of measurement was used and hence it was not possible to say by how much Scenario D was preferred to Scenario B. On the practical side, it is often the case that when asking questions to elicit more descriptive data, the question for the respondent to answer has to be more detailed and complex.



Tables 5.3 - 5.6 provide examples of how to collect the four different types of data.

Collecting nominal data is the easiest as questions only require a 'yes' or 'no' response (see Table 5.3). For example, a respondent either considers a management option important or they do not.

Table 5.3 Example of a question to collect nominal data

Question: Which of the following management options are important to you?

Tick (✓) all that apply.

Management Options	Tick
Economic	
Social	✓
Ecological	✓

Ordinal data is recorded in the form of a scale. People's ordered preferences are measured in relation to a created scale. Table 5.4 shows that respondents can rank their preferences according to the scale given, where '1' indicates the highest preference.

Table 5.4 Example of a question to collect ordinal data

Question: How much priority do you think each of the management options should be given by the government?

Assign the value '1' to the issues that should be tackled first, '2' to the issues which should be tackled second and assign '3' to the issues which should be tackled last.

Management Options	Rank (1, 2 or 3)
Economic	2
Social	1
Ecological	1

Interval data also reflects people's ordered preferences in relation to a created scale - however, unlike ordinal scales, the interval scale has equal intervals between the groups. Table 5.5, which could be used to collect interval data, requires respondents to think more clearly about their relative preferences and requires them to indicate the relative size of their preferences.

Table 5.5 Example of a question to collect interval data

Question: How important are each of the following management options (economic, social, ecological) to you?

Indicate how important they are by ticking (✓) the appropriate box for each option.

Management Options	Not at all important	A little bit important	Quite important	Very important
Economic		✓		
Social				✓
Ecological				✓

Finally ratio data, which reflects absolute values and hence can be used to reflect absolute differences between preferences, is collected using the most complicated form of question. To complete Table 5.6 the respondent must consider their absolute preferences for each of the management options. This is more difficult than merely stating that you prefer one option to another. Some respondents may find it difficult to place ratio values on their preferences because they are not familiar with thinking about their preferences in this way.

Table 5.6 Example of a question to collect ratio data

Question: How much priority do you think each of the management options should be given by the Government?

Divide 100 points among the three options to show how much priority should be given to each issue (if you feel one should be given no priority, allocate no points to it).

Management Options	Allocate all 100 points
Economic	20
Social	40
Ecological	40

It should be noted that if the researcher opts to collect ratio data, the numbers collected need to be interpreted carefully. In the example given, the votes cast by the participants were not associated with a money equivalent. This was important. Using money as a unit of comparison among people has problems associated with it, as it is often the case that a poor person places a higher value on \$100 than a rich person. With ratio data if one respondent allocates 50 points to ecological, 25 to economic and 25 to social we have to assume that this person values the environment twice as highly as either economic or social issues. If another person allocates 34 points to ecological, 33 to economic and 33 to social, they have the same preference order as the previous person, but their preferences for the environment are not as strong. Adding together the two people's preference values is not academically appropriate due to a problem known as interpersonal comparison of utility. This is a technical issue that can be overlooked in the interest of keeping the analysis simple, transparent and manageable. To avoid the problems associated with making interpersonal comparisons such ratio data can be treated as ordinal data, and hence could reflect ranked (i.e. 1st, 2nd and 3rd) preference.

Example 5.4 Using voting with the Buccoo Reef Tour Operators

The multi-criteria analysis model developed in the example boxes so far assumes that each of the criteria is equally weighted. To understand what happens when stakeholders' preferences for different management options are included in the analysis it is necessary to apply weights to the calculation. The weights were elicited in the stakeholder meetings described in section 4.3.

In the first stakeholder meeting, the Buccoo reef tour operators were asked to prioritise the main management issues for Buccoo Reef Marine Park. Each stakeholder was given a voting form (see Table 5.7), and were asked to vote in one of three ways. First, they were asked to indicate on their ballot which one of the three main issues (economic, social and ecological) they considered a priority for managers above the other two issues (see column 2 of Table 5.7). This was undertaken to focus the minds of the group on the issues that they felt needed immediate action.

Table 5.7 Example of a completed stakeholder voting form

Priority areas for management	Top priority issue	Rank priorities (1 = most important, 3 = least important)	Allocate 10 votes to the priorities
Economic		3	1/10
Social		2	3/10
Ecological	X	1	6/10

Participants were then asked to rank the three issues. They were asked to place a '1' beside the issue of most importance to them, a '2' next to the issue of second most importance and a '3' next to the issue of third most importance. Stakeholders were asked as far as possible not to rank two or three criteria the same in order to prevent them from ranking all issues as priority issues without thought (see column 3 of Table 5.7). Finally participants were asked to allocate ten votes to each of the specific sub-criteria. In this way the stakeholders were given a chance to allocate as many of the 10 votes to any or as many sub-criteria they felt were important to them (see column 4 of Table 5.7). The stakeholders were then asked if they wanted to change their initial ranking of the economic, social and ecological criteria.

The most important part of this process was the stakeholders ranking of the three main criteria. However, by asking them to allocate votes to specific sub-criteria it forced the stakeholders to think about relative priorities.

A summary of the prioritising exercise undertaken by the fishermen in one of the meetings is displayed in Table 5.8. The voting exercise identifies which criteria are afforded the highest priority by the members of each stakeholder group. The values are displayed in ratio form and so can be added and subtracted from each other and summary statistics including the median and modal average can be found.

Table 5.8 Summary of the votes cast by individuals in the fishermen's stakeholder group

Priority areas for management decision-making	Individual participants							Median
	#1	#2	#3	#4	#5	#6	#7	
Economic	2	2	2	2	2	2	2	2
Social	2	2	3	3	3	3	2	3
Ecological	5	5	4	4	4	4	5	4

These data show that for the fishermen the top priority for management is ecosystem health, the next most important item is socio-cultural issues, and economic issues are given the lowest priority.

To translate the values into weights, a scaling procedure is used.



For more on scaling, go to section 5.1.

5.4 Identifying a weighted ranking of the future scenarios

Within multi-criteria analysis, there are two levels at which **weights** can be applied: at the criteria level, and the sub-criteria level. Applying weights to the criteria reveals the management priorities among the criteria groups. Applying weights to the sub-criteria can be undertaken to reflect the relative importance of the sub-criterion *within* the main criteria groups.

Weights

Weights are numbers that can be attached to a group of items in order to represent the relative importance of the different items.

The example from Buccoo Reef only deals with the allocation of weights at the criteria level. If a researcher feels that applying weights at the sub-criteria level is appropriate the same principles described below should be applied. The actual application of weights to the multi-criteria analysis model is a straightforward process whereby the weights (in percent format) are multiplied by the scaled values (scores).

Example 5.5 Applying weights to the Buccoo Reef Effects Table

Applying a range of stakeholder derived weights to the Effects Table for Buccoo Reef Marine Park demonstrates how different preferences for management criteria by the stakeholders can show the level of support for different management strategies that would lead to the alternative future scenarios. The weights for a stakeholder with preferences for social improvement and ecosystem health, but with less concern for the direct economic issues might be:

Economic issues:	0.05
Social issues:	0.55
Ecological issues:	0.40
Total:	1.00

Using the various sets of the stakeholder-defined management priorities (in the form of weights), a weighted ranking of the possible future scenario can now be made. To illustrate the impact of different stakeholders' management priorities on the ranked outcomes the weights above (from the stakeholder with a strong preference for prioritising social issues) are multiplied by the scored values in Table 5.1 as shown in Table 5.9.

Table 5.9 Summary Effects Table showing weighted scores (calculation of weighted score in parentheses)

Criteria	Scenario			
	A	B	C	D
Economic	1 (0.05 x 10)	3 (0.05 x 60)	2 (0.05 x 40)	4 (0.05 x 75)
Social	28 (0.55 x 50)	13 (0.55 x 23)	33 (0.55 x 60)	37 (0.55 x 67)
Ecological	32 (0.40 x 79)	40 (0.40 x 100)	0 (0.40 x 0)	19 (0.40 x 48)
Total	61	56	35	60

To identify the preference ranking of the weighted future scenarios, the scores under each scenario are added:

$$\text{Scenario A : } 1 + 28 + 32 = 61$$

$$\text{Scenario B : } 3 + 13 + 40 = 56$$

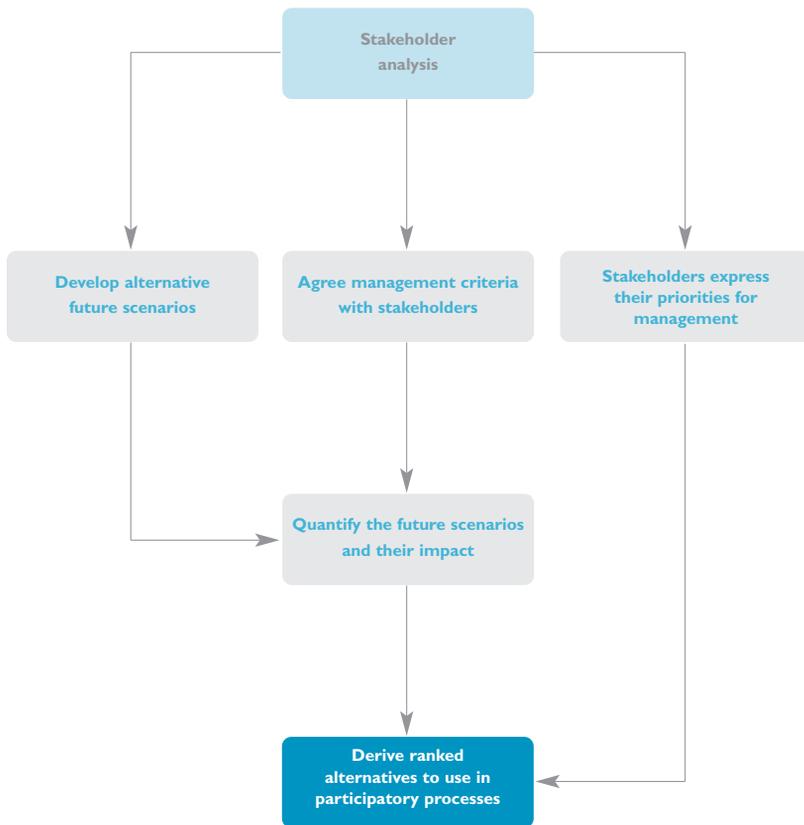
$$\text{Scenario C : } 2 + 33 + 0 = 35$$

$$\text{Scenario D : } 4 + 37 + 19 = 60$$

Using the sample set of weights, which show a high priority for improved management of social issues and ecological interests, but less priority for economic issues, Scenario A (with the highest score) is the most preferred scenario. It is important to note here the impact of including weights into the model, as it changes the most preferred outcome from Scenario D (see Table 5.1).

C H A P T E R 6

Participatory consensus building



Participatory
consensus building

Topics covered

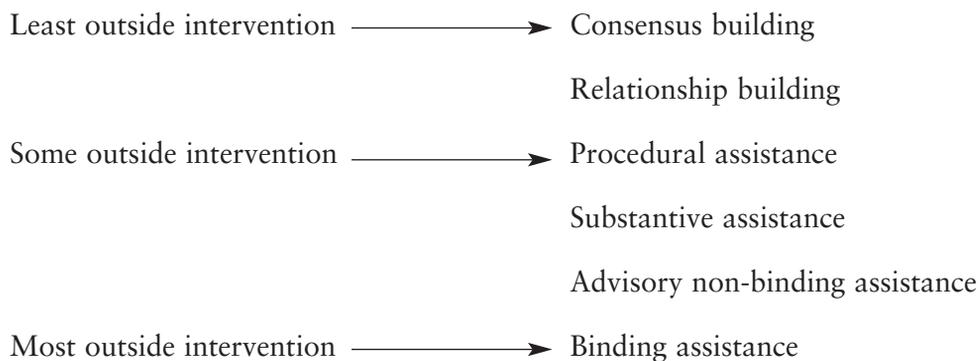
- Using multi-criteria analysis to bring stakeholder groups together
- Conflict assessment and management
- Consensus building
- Developing a longer term commitment to participatory decision-making

Before bringing stakeholders together, it is necessary to consider carefully how to approach each stakeholder group as conflicts of interest can easily become interpersonal disputes. Personality conflicts can occur between people within the same group, or between groups. Planning should ensure that all primary stakeholder groups, as well as all members of the stakeholder group are given equal opportunity to participate and to voice their preferences and concerns. It is very important to ensure that certain individuals are not immediately excluded because of their role within the group, or their role in society.

6.1 Bringing stakeholder groups together

Many techniques and tools exist which can be used to bring stakeholders together and to elicit their views and preferences on controversial and disputed issues. At one end of the scale there is consensus building - where there is minimum intervention from outside parties, where stakeholders find solutions among themselves. At the other end of the continuum there is enforced arbitration, either through the private arbitrators or the judicial system (see Figure 6.1).

Figure 6.1 Continuum of levels of intervention by a third party in conflict resolution activities



The techniques at the ‘minimum intervention’ end of the scale are often the cheapest means to resolve conflict. As soon as outside arbitrators are involved financial and time costs increase substantially. The least intervention options are also the most manageable by the coastal zone managers, who may not have a background in conflict management.

It may not always be possible to minimise direct intervention. For example, well known coastal zone management issues such as fisheries disputes over territorial waters may need international arbitration. If more intervention is required there are many resources which are available to assist the researcher.

 For more information on conflicts go to section 2.4 ‘Conflicts’

Example 6.1 Consensus building techniques used at Buccoo Reef

For the case study at Buccoo Reef Marine Park we have used relationship building methods and consensus building techniques and have tried to minimise the level of direct intervention in the conflict management process.

It was possible to use these methods as the numbers of people involved in the Buccoo Reef study were relatively small. In addition, the groups were located near each other and most importantly, there were very clearly areas of agreement amongst stakeholders.

6.2 Conflict assessment and management

The first stage in building consensus is to assess the issues that are involved, the source of the conflict, the people involved in the dispute, the nature of each groups’ or individuals’ interests or concerns, the legal and institutional context and the stage of the conflict. The willingness of stakeholders to participate in the process must be gauged and the researcher may have to work at building trust in the process. These issues have been covered earlier in the manual.

 Section 3.4 on Building Trust in Participatory Processes.

To review, the steps to take in assessing conflict are:

1. Notify individuals and stakeholder groups about what is planned, and the purpose of the exercise.

 Section 3.5 ‘Engagement Techniques’

2. Arrange and manage stakeholder or group interviews.

 Section 4.3 ‘How to choose between alternative future scenarios?’

3. Ensure the information collected in each stakeholder meeting is correct and accurately reflects stakeholders’ interests.

 Example 4.3 ‘Engaging the Buccoo Reef stakeholders; the first meeting’

This Chapter describes the general principles involved in conflict management, when the different stakeholders have stated their preferences and their concerns.

Two rules of thumb guide conflict management.

- 1) Do not bargain over positions.
- 2) Separate the people from the problem.

Conflict management principles should guide the researcher from the beginning of the process. From the initial introduction to the stakeholder groups, the researcher must focus on drawing out the issues, the conflicting interests among the different users of the resource and not allow discussions to reduce to conflicting personal disputes.

The researcher must be aware that hierarchies may exist within stakeholder groups that prevent certain individuals from speaking openly, there may be taboos about certain subjects, or there may be personality clashes. Whenever discussions become heated and individuals start to stake their position, the researcher must intercede and move the issue back to the interests and needs of the stakeholders. By doing this repeatedly, the message is given that the researcher is not interested in personal feuds, only in resolving the problem, which is essentially what the stakeholders also want.

One of the main reasons for bringing the stakeholder groups together is to build foundations on which consensus can be built. A starting point is to find areas of common ground among the stakeholders. Providing a forum to discuss priorities and the implications of different weights on the outcome of the multi-criteria analysis is a means of achieving this objective. Some individuals have anxieties about talking in front of other people, small meetings with the same group of people offer an environment where such people can practice their arguments and gain confidence in articulating them.

The researcher must also try to elicit from the stakeholders a range of possibilities on how to solve the problems. The best way for the researcher to achieve this is to carefully structure the focus group or interview before the event. Focus groups serve many functions, including eliciting weights for the multi-criteria analysis process, generating discussion and working towards conflict management.



Appendix 3 for a copy of the moderators notes' used in discussing Buccoo Reef Marine Park with one stakeholder group.

6.3 Consensus building

Once a series of smaller meetings have been held with individual stakeholder groups, all groups should eventually be brought together to find areas of agreement in a consensus building meeting or workshop.

Preparations to facilitate the consensus building meeting include:

- All participants should be known to the researcher, and personally invited.
- Similar numbers of participants should be invited from each group.
- Participants should know in advance the purpose and objectives of the consensus building meeting.
- Participants should know which other groups will be attending, but not individual names.
- Confidentiality should be assured.
- Stakeholder groups not involved in the process so far should not be invited (if the group continues to meet, additional parties may attend at the original groups invitation).
- The venue should have comfortable chairs and refreshments.
- A facilitator, ideally someone who is respected and locally known to be unpartisan, is useful.
- All groups should be encouraged to attend through follow up letters and phone calls.
- The meeting should have a comprehensive agenda, with clear time guides - distributed in advance.
- Participatory techniques for the consensus building meetings enable the stakeholders to become more involved in the consensus building process.

Further points to promote successful consensus building meetings include:

Before the meeting

- Arrive early and lay out the room to facilitate discussion with chairs in a circle or a horse-shoe shape, so that all participants are equal. Avoid a teacher-in-school-room layout.
- Brief all team members (including photographer, note takers, facilitator, assistants, presenters, catering staff) on their specific roles, the format of the day, what to do in the event of a time over-run or a significant no-show by participants, and any other possible scenarios.
- Set out only as many chairs as the number of people expected. If spare chairs are left at the back - people will sit there first and feel less involved.

During the meeting

- Start on time.
- Have an assistant stationed by the door to lead late-comers into the centre of the meeting, to prevent too many people from 'sitting at the back'.
- Establish very clear participation ground rules. For example: put your hand up

when you want to speak, always state your name before you speak, no personal feuds to be introduced. By doing so, participants are forced to stop and think before they speak.

- Initiate the meeting by asking all participants to introduce themselves and say what they expect from the meeting, or why they are there.
- Set clear time limits for parts of the meeting (including introductions).
- Describe the objectives of the day and the items on the agenda briefly.
- Listen and record all details as meticulously as possible.
- Clarify factual issues that are clearly misunderstood by participants.
- Use the agenda to keep the meeting moving.
- Summarise agreements while all participants are there.
- Identify additional information needed to make decisions.

At the end of the meeting

- Finish on time.
- Establish action items.
- Obtain verbal agreement on the next actions to be taken.
- Thank the participants for their time and contribution.



Example 6.2 Extracts from the Consensus Building Stakeholder Workshop for Buccoo Reef Marine Park, Tobago, April 1999.

The objective of the workshop was to bring together primary stakeholders and to build consensus on management issues. The workshop sought specifically to: identify three areas of consensus between stakeholders as the starting points for setting management priorities for the resources associated with Buccoo Reef; and identify three practical means of working towards achieving and implementing decisions based on areas of consensus.

At the workshop, the stakeholders pinpointed their main areas of concern, in terms of long term challenges, medium term planning issues and immediate problems. The stakeholders agreed that their priorities were:

1. Dealing with the issues of limited awareness and knowledge of the environment of Tobago (the long term challenge);
2. The level of waste water treatment (a medium term planning issue);
3. Direct physical damage to the reef, i.e. reef walking and anchoring (an immediate problem);
4. Oil and gas pollution in the lagoon (an immediate problem).

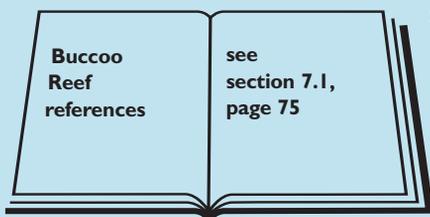
The stakeholders identified a number of actions that could be implemented, by themselves, by their stakeholder group, by their community group, or by the THA, immediately, in the medium term and also in the longer term to bring about change.

Figure 6.2 Stakeholder votes



The process highlighted several important lessons for resource management:

1. The way forward will involve building on the resources that people already have - local knowledge, experience, and ideas. Concentrating on solutions which require resources that are in short supply, such as money, will not bring about change. Opportunities exist to develop partnerships between local communities, stakeholder groups, government agencies and NGOs.
2. Concentrate on what is achievable. Considering unrealistic solutions, given the financial and human constraints, is a waste of limited resources.
3. Focus on the areas that have broad support. The consensus building workshop proved that there are areas of agreement amongst the stakeholders. Taking action on those areas of agreement can lead to increased co-operation amongst the groups, and should motivate the groups to reach further agreement.



6.4 Lessons learned from applying trade-off analysis

The techniques and examples outlined in this manual are meant as a guide to undertaking participatory management through seeking consensus and using available knowledge through trade off analysis. As highlighted in this final chapter on building consensus there are a number of key factors which can ensure the success of participatory management.

- Inclusiveness is all important - the initial stakeholder analysis is key in identifying and analysing all relevant stakeholders.
- Appropriate mechanisms and methods should be used to facilitate the participation of all stakeholders.
- Maintain the flow of information and feedback throughout the process to inform all stakeholders. Some stakeholders may be easier to meet or communicate with but it is important to disseminate to all groups in the appropriate format.
- Taking time to meet with stakeholders validates their diverse knowledge. This builds the trust and confidence of different actors and avoids placing too much weight on one groups' viewpoint.
- Use small groups to build this confidence and trust.

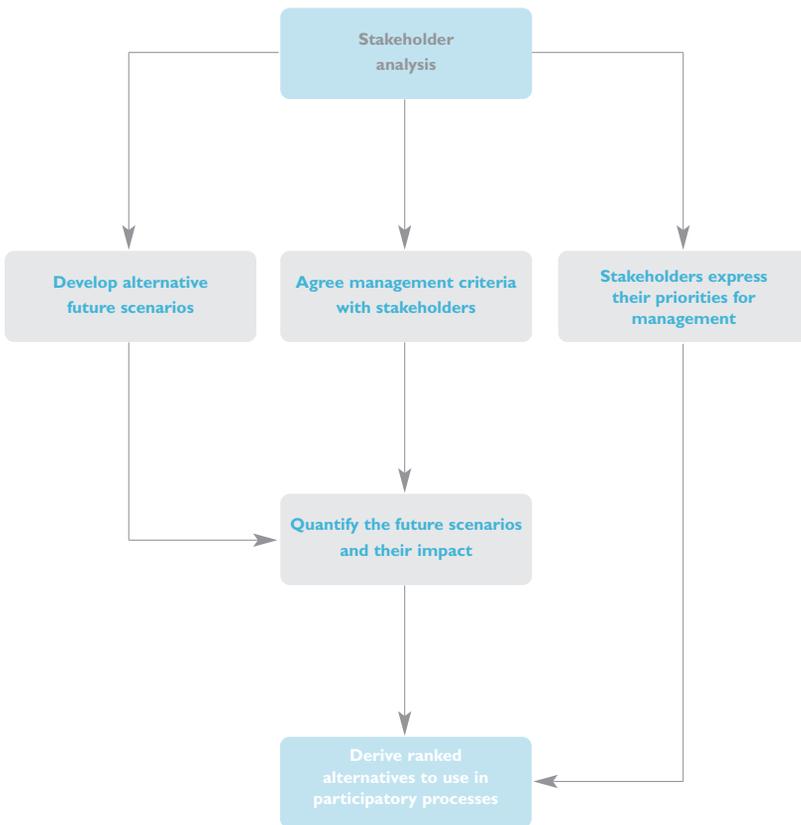
For most coastal management issues, finding consensus is not necessarily an end-point but part of an on-going negotiation. It is also an important means of finding common priorities and action points. The institutions and researchers involved in coastal planning can use trade-off analysis to take the first steps towards shared management of coastal resources.

Shared management responsibilities can enhance the sustainability of coastal resource use, but as this manual has shown, shared management often requires greater inclusiveness and sometimes new institutional arrangements. The participatory processes of listening to stakeholders may require resources and new ways of doing things. Further, the recommendations of stakeholders often require new policy measures and integration across government departments and agencies. The end result of trade-off analysis can be a shift in the balance of power in favour of poor, marginalised and excluded groups for the benefit of a more sustainable society.



C H A P T E R 7

Further applications and information



Stakeholder analysis

Multi-criteria analysis

Participatory consensus building

Further applications and information

7.1 References

Coastal zone references

Birkeland, C. (Ed.), 1997, *Life and Death of Coral Reefs*, Chapman & Hall, New York.

This is an excellent source of information on the history, ecology, biology, impacts of human activities and management of coral reefs.

Cambers, G. (1992) *Coastal Zone Management: Case Studies from the Caribbean*. Latin America and the Caribbean Technical Department, World Bank. Regional Studies Program, Report No. 26, December 1992.

Provides a summary of various coastal zone issues around the Caribbean.

<http://www.uicnhumedales.org/english/index.htm>

This is a useful website for general information on wetlands and coastal zones.

Coastal zone management references

Kay, R., Alder, J. (1998) *Coastal Planning and Management*. Spon Press, London. This is a comprehensive toolkit for coastal planners and those aiming to achieve effective coastal management worldwide.

White, A.T., L.Z. Hale, Y. Renard, L. Cortesi (1994) *Collaborative and community-based management of coral reefs. Lessons from experience*. Kumarian Press, Hartford, Connecticut.

Provides useful examples and practical advice on different methods of including the community in coral reef management.

<http://www.iczm.org/>

This web site provides back issues of the journal of Integrated Coastal Zone Management, and links to international conventions that apply to the coastal zone:

<http://www.ocrm.nos.noaa.gov/czm/welcome.html>

The US Office of Ocean and Coastal Resource Management web site provides information about the US coastal zone management programme including a copy of the U.S. Coastal Zone Management Act.

Participation and participatory resource management

IIED (1994) *Whose Eden? An Overview of Community Approaches to Wildlife Management*. International Institute for Environment and Development, London. July 1994.

This report to the Overseas Development Administration of the British Government is a good reference on the advantages and disadvantages of active community participation in decision making. It describes the range of participatory

approaches for wildlife management as well as a history of top-down approaches. It is illustrated by useful case studies from developing countries.

<http://www.worldbank.org/wbi/sourcebook/sbhome.htm>

The World Bank Participation Sourcebook is an excellent source of downloadable methods and tools for active participatory processes.

<http://nt1.ids.ac.uk/eldis/prapra.htm>

A very useful site that contains direct links to on-line participation manuals by the UNDP and the Inter-American Development Bank, as well as references to major Web participation-in-action sites, bibliographic sources, and information networks.

<http://www.ispnet.org/policyfme.htm>

This site describes a policy framework, developed by the Organisation of American States, for participation in sustainable development decision making, and draws out six main principles for participation.

Consensus building/conflict resolution references

Fisher, R, W. Ury (1982) *Getting to Yes: Negotiating Agreement Without Giving In*. Hutchinson Press, London.

This is an excellent resource for those managing conflict for the first-time, as well as the more experienced. The book presents the method first and then backs it up with case studies.

Rijsberman, F. (Ed) (1999) *Conflict Management and Consensus Building for Integrated Coastal Management in Latin America and the Caribbean. Technical Papers Series. Inter-American Development Bank, Sustainable Development Department, Washington D.C., December 1999.*

This IDB book offers clear descriptions of conflict, and conflict management and through the use of three case studies suggests what can go wrong in the conflict management process, as well as highlighting important lessons learned in the three cases.

Good web sites also exist such as <http://www.resolv.org/> which offers good advice and plentiful resources on conflict resolution and consensus building.

Identifying stakeholders and stakeholder analysis references

Grimble, R.J., J. Aglionby, J. Quan (1994) *Tree Resources and Environmental Policy: A Stakeholder Approach. NRI Socio-economic Series 7.* Natural Resources Institute, University of Greenwich, Chatham, UK

This offers a very clear guide on how to identify stakeholders.

Grimble, R. and M.-K. Chan (1995). Stakeholder analysis for natural resource management in developing countries. *Natural Resources Forum* 19(2) pp.113-124

Practical guidance on undertaking stakeholder analysis.

Overseas Development Administration (1995) *Guidance Note on How to Do Stakeholder Analysis of Aid Projects and Programmes*. Overseas Development Administration, Social Development Department, London, July 1995. A full text version of this publication can be found at:

<http://carryon.oneworld.org/euforic/gb/stake1.htm>

This is a practical users guide on how to undertake a stakeholder analysis for a development project.

Multi-criteria analysis references

David L. Olson (1996) *Decision Aids for Selection Problems*. Springer Series in Operations Research. Springer-Verlag, New York.

This is a very clear book that describes how to undertake multi-criteria analysis using various techniques. It provides many useful case studies and references to clarify the points it makes.

Janssen, R. (1994) *Multiobjective Decision Support for Environmental Management*. Kluwer Academic Publishers, Dordrecht.

This book clearly describes how to undertake a multi-criteria analysis and supports a multi-criteria analysis computer package (DEFINITE) which can be used to undertake the analysis. The book is clearly laid out and is possibly the easiest text on multi-criteria analysis, however, since multi-criteria analysis is a statistical method the reader should be able to understand basic statistics.

Keeney, R. L. and H. Raiffa (1993) *Decisions with Multiple Objectives: Preferences and Value Tradeoffs*. Cambridge University Press, Cambridge.

This is a more technical book for use by experienced economists and statisticians only, it describes the theory underlying multi-criteria analysis.

Focus group and qualitative research references

Bernard, H. R. (1995) *Research Methods in Anthropology: Qualitative and Quantitative Approaches*. Second edition. Altamira Press, Walnut Creek, CA.

This book provides a thorough introduction on how to undertake basic qualitative research, and on how to collect qualitative and quantitative data.

Churchill, G. A. (1996) *Basic Marketing Research*. Third edition. Dryden Press, Orlando, FL.

This provides clear guidance on qualitative questionnaire design, and analysis of data collected in questionnaires.

Krueger, R. A. (1994) *Focus Groups: A Practical Guide for Applied Research*. Second edition, Sage Publications, Thousand Oaks, CA.

Morgan, D. L. (1997) *Focus Groups as Qualitative Research*. Sage Publications. Newbury Park, CA.

Either the Krueger or Morgan book can be used as a complete manual on how to organise, manage, and understand focus groups. They are both accessible to first-time readers in the subject, and are both straightforward in their approach.

Buccoo Reef references

Adger, W.N., K. Brown, E. Tompkins, P. Bacon, D. Shim, K. Young (2000) Evaluating Trade-offs between Uses of Marine Protected Areas in the Caribbean. In *Sustainable Development and Integrated Appraisal in a Developing World*. Edited by N. Lee and C. Kirkpatrick. Edward Elgar, Cheltenham, U.K. pp 159-179.

Brown, K. W.N. Adger, E. Tompkins, P. Bacon, D. Shim, K. Young (1998) A Framework for Incorporating Stakeholder Participation in Marine Resource Management: A Case Study in Tobago. *CSERGE Working Paper GEC 98-23*, Centre for Social and Economic Research on the Global Environment, University of East Anglia, Norwich, U.K.

Both of these references provide more information on the application of trade-off analysis specifically to Buccoo Reef Marine Park.

Adger, W.N., Brown, K., Tompkins, E., Young, K. (1999) *Report of the consensus building stakeholder workshop for Buccoo Reef Marine Park, Tobago*. ODG Research Working Paper, April 1999. Overseas Development Group (ODG), University of East Anglia, Norwich, U.K.

Describes the events of the consensus building workshop, and summarises the list of actions agreed by workshop participants.

Other case studies in the Caribbean

The Soufriere Marine Management Area (SMMA) is an on-going community-based management project that was established at Soufriere in Saint Lucia. For more information on the Soufriere Marine Management Area see web site:

<http://www.smma.org.lc>

or contact the SMMA directly, details given in section 7.2.

7.2 Contact addresses for other organisations

Caribbean Coastal Marine Productivity Programme (CARICOMP)

Mailing address: Centre for Marine Studies, University of the West Indies,
Mona, Kingston 6, **Jamaica**, West Indies

Telephone: + 1 (876) 927 1069

Facsimile: + 1 (876) 977 1033

Email: pgayle@uwimona.edu.jm

Web address: <http://isis.uwimona.edu.jm/centres/cms/caricomp>

Caribbean Natural Resources Institute (CANARI),

Director: Dr Yves Renard

Street location: New Dock Road, Vieux Fort, **Saint Lucia**, West Indies

Mailing address: P.O. Box 383, Vieux Fort, **Saint Lucia**, West Indies

Telephone: + 1 (758) 454 6060

Facsimile: + 1 (758) 454 5188

Email: canari@candw.lc

Caribbean: Planning for Adaptation to Global Climate Change (CPACC)

Mailing address: CPACC Regional Project Implementation Unit, Lazaretto
Complex, St. Michael, **Barbados**, West Indies

Telephone: + 1 (246) 417 4580

Facsimile: + 1 (246) 417-0461

Email: cpacc@sunbeach.net

Web address: <http://www.cpacc.org>

Centre for Social and Economic Research on the Global Environment (CSERGE)

Director: Prof. Kerry Turner

Mailing address: CSERGE, University of East Anglia, Norwich, Norfolk,
NR4 7TJ, **United Kingdom**

Telephone: + 44 (0) 1603 593738

Facsimile: + 44 (0) 1603 593739

Email: sian.pearce@uea.ac.uk

Web address: <http://www.uea.ac.uk/env/cserge/>

Centre for the Economics and Management of Aquatic Resources (CEMARE),

Mailing address: Department of Economics, University of Portsmouth,
Milton Campus, Locksway Rd., Portsmouth, PO4 8JF,
United Kingdom

Telephone: +44 (0) 1705 844091

Fax: +44 (0) 1705 844037

Email: elizabeth.bennett@port.ac.uk

Web address: <http://www.pbs.port.ac.uk/econ/cemare>

Coastal Management Centre (CMC), University of Rhodes Island

Director: Dr Steven Olsen
 Mailing address: Narragansett Bay Campus, R.I. 02882, USA
 Telephone: + 1 (401) 874-6489
 Facsimile: + 1 (401) 789-4670
 Web address: <http://crc.uri.edu/>

DEFINITE MCA package

Author: Dr. Ron Janssen
 Address: Institute for Environmental Studies,
 Free University of Amsterdam,
 Amsterdam, **The Netherlands**

Department for International Development (Dfid), Caribbean

Senior Natural Resources and Environment Advisor: Dr Richard Beales

Mailing address: P.O. Box 167, Lower Collymore Rock, St. Michael,
Barbados

Email: r-beales@dfid.gtnet.gov.uk
 Web address: <http://www.dfid.gov.uk>

Department of Marine Resources and Fisheries, Tobago House of Assembly

Director: Dr Arthur Potts
 Street Address: TLH Building, Milford Rd. Scarborough, **Tobago**
 Mailing address: Department of Marine Resources and Fisheries, Botanic
 Station, Scarborough, **Tobago**
 Telephone: + 1 (868) 639-4354
 Facsimile: + 1 (868) 639-4446

Environmental Management Authority (EMA), Trinidad and Tobago

CEO/Director: Dr Dave McIntosh
 Street location: 2nd Floor, The Mutual Centre, 16 Queen's Park West, Port
 of Spain, **Trinidad**
 Mailing address: EMA, P.O. Bag 150, Newtown P.O., Port of Spain, **Trinidad**
 Telephone: + 1 (868) 628-8042/4/6
 Facsimile: + 1 (868) 628-9122
 Email - general: ema@ema.co.tt
 Email - Info. Office: infoctr@ema.co.tt
 Web address: <http://www.ema.co.tt>

HIVIEW MCA Package

Company name: KRYVALIS Ltd.
 Managing Director: Colin Simmons
 Mailing address: 28 Derwent Drive, Maidenhead, Berkshire, SL6 6LB, **United
 Kingdom**
 Telephone: + 44 (0) 1628 636861
 Facsimile: + 44 (0) 1628 638390

Institute of Marine Affairs (IMA), Trinidad and Tobago

Director: Dr Hazel McShine
 Street location: Hilltop Lane, Chaguaramas, **Trinidad**
 Mailing address: IMA, P.O. Box 3160, Carenage, **Trinidad**
 Telephone: + 1 (868) 634-4291/2/3/4
 Facsimile: + 1 (868) 634-4433
 Email: director@ima.gov.tt
 Web address: <http://www.ima.gov.tt>

International Association for the Study of Common Property (IASCP)

Mailing address: IASCP/Workshop in Political Theory and Policy Analysis,
 Indiana University, Woodburn Hall 220, Bloomington, IN
 47405-6001 USA
 Telephone: + 1 (219) 980-1433
 Facsimile: + 1 (219) 980-2801
 E-mail: iascp@indiana.edu
 Web address: <http://www.indiana.edu/~iascp/>

International Institute for Environment and Development (IIED)

Mailing address: IIED, 3 Endsleigh Street, London, WC1H 0DD, **United Kingdom**
 Telephone: +44 (0)20 7388-2117
 Facsimile: +44 (0)20 7388-2826
 E-mail: mailbox@iied.org
 Web address: <http://www.iied.org/>

Land-Ocean Interactions in the Coastal Zone (LOICZ)

Street address: LOICZ International Project Office, Netherlands Institute
 for Sea Research , Landsdiep 4, 1797 SZ 't Horntje, Texel,
The Netherlands
 Mailing address: P.O. Box 59, 1790 AB Den Burg, Texel, **The Netherlands**
 Telephone: +31 (222) 369 404
 Facsimile: +31 (222) 369 430
 E-Mail: loicz@nioz.nl
 WWW Home Page: <http://www.nioz.nl/loicz/>

Organisation of American States (OAS)

Director: Mr J. C. Campbell
 Street address: 49 Dundonald St., Port of Spain, **Trinidad and Tobago**
 Mailing address: P.O. Box 1231, Port of Spain, **Trinidad and Tobago**
 Telephone: +1 (868) 625 4192
 Facsimile: +1 (868) 623 8853
 Web address: <http://www.oas.org>

Overseas Development Group (ODG), University of East Anglia

Director: Dr James Sumberg
Mailing address: ODG, University of East Anglia, Norwich, Norfolk, NR4
7TJ, **United Kingdom**
Telephone: +44 (0) 1603 457 880
Facsimile: +44 (0) 1603 505 262
Email: odg.gen@uea.ac.uk
Web address: <http://www.uea.ac.uk/dev/odg/>

Policy Research and Development Institute (PRDI), Tobago House of Assembly

Director: Dr Vanus James
Mailing address: Corner Main and Burnett St., Scarborough, **Tobago**, West
Indies
Telephone: + 1 (868) 660 7063/5
Facsimile: + 1 (868) 660 7065

Soufriere Marine Management Area (SMMA)

Mailing address: SMMA, P.O. Box 305, 3 Bay Street, Soufriere, **Saint Lucia**,
West Indies
Telephone: + 1 (758) 459 5500
Facsimile: + 1 (758) 459 7799
Email: smma@candw.lc
Web address: <http://www.smma.org.lc/>

7.3 Glossary of terms

Criteria

See management criteria

Decision-makers

The individual, or groups of individuals who directly or indirectly make the decisions which change the way in which the coastal zone is used or managed.

Development scenario

Hypothetical description of the future under different decisions. The description includes estimated levels of the key drivers of change.

Driver

Factors that force change (in society, the environment, in individual behaviour, or in the economy). These factors could be determined by national government policy, by environmental change or by external events, for example drivers of change could be sea level rise due to climate change, or a new enforced government policy to reduce immigration.

Effects Table

A matrix with columns and rows which displays information that describes how the different **management criteria** are effected by the alternative future **development scenarios**.

External stakeholders

Stakeholders with influence but who are not important to the decision-makers. These stakeholders will generally not be directly affected by the outcome of the decision.

Focus group

Basically group interviews, where there is space for the interaction between members of the group. It is the interaction between the group members that generates the qualitative data.

Importance

The priority given to the stakeholders by the coastal zone managers. This may be different from the priority given to the stakeholders by others, such as the decision-makers. Highest importance is given to those stakeholders whose interests are most in line with the coastal zone managers.

Influence

The power which stakeholders have to change the way a decision is made, or a project is managed. Power may come from the nature of the organisation, or the stakeholders position relative to other stakeholders.

Interests

Issues that the stakeholders consider important to the sustainability of their livelihoods and well-being.

Interval scale

Ranks information into ordered groups, with equal intervals between groups. There is no absolute zero point. Interval data is a more advanced level of measurement than ordinal data and can be added and subtracted.

Management criteria

A criterion is a measure of effectiveness, it is the basis for evaluation of the [development scenarios](#). Criteria can emerge as attributes of the coastal zone, or as objectives identified in the initial problem-setting. For example, criteria might be economic benefits, or environmental costs.

Management strategies

See [development scenarios](#)

Management sub-criteria

These are similar to [management criteria](#). However, rather than describing a range of issues (such as economic benefits), management sub-criteria describe very specific and measurable issues, such as macro-economic benefits to Tobago.

Multi-criteria analysis (MCA)

Multi-criteria analysis is a method of ranking a set of alternative options on the basis of a set of defined evaluation criteria. It is a tool that is often used to support decisions where there are conflicting management objectives and conflicting stakeholder preferences.

Nominal scale

The nominal scale classifies data into mutually exclusive categories that can be used for identification purposes. It is a naming device only.

Normalise

See standardise

Ordinal scale

Ranks information into ordered groups, where higher group numbers indicate more of the group characteristic. This type of data is more easily manipulated than nominal data. Median and modal averages can be estimated although some statistics cannot be estimated.

Primary stakeholders

Those most directly affected by the decision-made: their interests are the focus of management decisions.

Qualitative

Relating to distinctions based on distinguishing characteristics, attributes, or qualities, such as the quality of a product, performance ratings such as good, average, poor.

Quantitative

Capable of being measured. Relating to distinctions based on size or quantity, such as wage rates, prices of goods, age.

Ratio scale

This is the most advanced form of measurement, and is an interval scale with an absolute zero point. All arithmetic operations are possible and magnitudes can be compared.

Scales

Units of measurement. There are four types: nominal, ordinal, ratio and interval.

Scaling

The process of transforming data into scales.

Scenarios

See [development scenarios](#).

Scores

Numerical records. In this case, scores are the numbers in the scales.

Secondary stakeholders

Intermediaries in a coastal zone management programme or project. They usually either fund, implement, monitor or advocate management decisions.

Stakeholders

Stakeholders are persons, groups or institutions with interests in a coastal zone management project or programme.

Standardise

If [criteria](#) are measured on different management scales, they must be standardised to a common dimensionless unit. The process of transformation of the scales is known as [standardisation](#) or [normalisation](#).

Sub-criteria

See management sub-criteria

Weights

Weights are numbers that can be attached to a group of items (such as criteria) in order to represent the relative importance of the different items.

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A P P E N D I X I

Moderators notes from first focus group meeting:
to agree criteria

Appendix I: Moderators notes from first focus group: to agree criteria

All text in **bold** was read, all text in *italics* were questions that were asked and then discussed, all text in CAPITALS describes actions taken by the researchers at the meeting.

INTRODUCTION OF TEAM MEMBERS AND ORGANISATIONAL AFFILIATIONS. EXPLAIN PURPOSE OF PROCESS AND OBJECTIVES OF THE SESSION:

- 1) TO SHARE INFORMATION WE HAVE COLLECTED ON BRMP
- 2) TO INVOLVE THOSE PRESENT IN THE DECISION-MAKING PROCESS BY ASKING THEM TO STATE THE ISSUES THAT CONCERN THEM MOST

EXPLAIN: CONFIDENTIALITY, NOTE TAKERS IS NOT RECORDING NAMES - ONLY OPINIONS.

To begin, with Ms X will describe how Tobago might change over the next 10 years, and how it may look in 2007 if it carries on its current path and also if certain changes occur. We will then ask you some questions, then we will present some more of our findings, about the possible economic, social and ecological impacts of these changes. Please feel free to ask questions at any time.

HANDOUT INFORMATION SHEET TO EACH PARTICIPANT

PRESENT ALTERNATIVE FUTURE SCENARIOS

Now I am going to ask you some questions but please: only one person speak at a time so that the person who is writing notes can record all your opinions, and please speak up so we can hear you. There are no right or wrong answers but rather differing points of view. Please feel free to share your point of view even if it differs from what others have said, and keep in mind that we're just as interested in negative comments as positive comments, and at times the negative comments are the most helpful.

1. *What are you hearing people say about Buccoo Reef Marine Park? Do you agree with them?*

We will now describe some of the data we have collected which measures what some of the economic, social and ecological impacts of the various development options could be. We will talk for about 15 minutes and please ask us questions at any time.

HAND OUT MCA TABLE TO EACH PARTICIPANT

2. *What economic issues are most important to you and why?:*

PROMPT (IF NECESSARY) WITH: MONEY TO YOU NOW/ MONEY COMING IN - IN THE LONG TERM/ LONGER TERM VISITORS ENJOYMENT - REPEAT VISITS/ SHORT TERM VISITOR ENJOYMENT

3. *What social issues are most important to you and why?:*

PROMPT (IF NECESSARY) WITH: JOBS IN THE HOSPITALITY INDUSTRY/ ACCESS TO THE BEACHES AND THE MANGROVES/ PEOPLES LIVELIHOODS OUTSIDE THE FORMAL HOSPITALITY INDUSTRY

4. *What environmental issues are most important to you and why?:*

PROMPT (IF NECESSARY) WITH: MANGROVE HEALTH/ SEAGRASS HEALTH/ WATER QUALITY/ CORAL COVER

5. *Of all the issues that we have just discussed, which one single issue do you think would have the most impact on you? And why? Please pick one or two issues and explain why they are the most important to you*

6. *I have one last question, if you were the Prime Minister, and you had the money and power to improve just one thing in SW Tobago, what would it be?*

[TO THE ASSISTANT MODERATOR] Do you have any points of clarification you require from the group?

ASSISTANT MODERATOR ASKS GROUP FOR CLARIFICATION WHERE IS NECESSARY

[TO THE ASSISTANT MODERATOR] Could you now please summarise the discussions that have occurred, and the groups responses to the questions.

[TO THE GROUP] Please could you listen to the Assistant Moderator, and correct him if you believe his records are inaccurate.

ASSISTANT MODERATOR SUMMARISES THE DISCUSSIONS

Thank you very much for attending. We are going to be asking these questions and presenting this data to all the other important groups in the area (fishermen, local village council, church groups, THA, dive association, watersports operators and the beach/street vendors). We will look at how your preferences change our results, then we will come back to you and let you know the results of this analysis. I hope you will be willing to meet with us again.

Thank you again for your time and participation.

A P P E N D I X 2

Contingent Valuation Questionnaire

Appendix 2: Contingent Valuation questionnaire

**UNIVERSITY OF EAST ANGLIA & UNIVERSITY OF THE WEST INDIES
DICHOTOMOUS CHOICE SURVEY (USD4)
ATTITUDES TOWARDS BUCCOO REEF MARINE PARK**

Questionnaire. No: D_C24

Alone/group:

Location:

Date:

Interviewer:

Start time:

Respondent (M/F):

End time:

Good day. My name is ., I am carrying out a survey for the University of the West Indies on visitors and residents opinions and attitudes towards Buccoo Reef Marine Park. I would be grateful if you would allow me to ask you the following questions. It takes about 10 minutes. Please respond carefully and truthfully as your answers will be used for policy making. This is not a marketing or sales survey and any information given will be treated in the strictest confidence.

I DON'T NEED TO KNOW YOUR NAME OR YOUR ADDRESS.

A. QUESTIONS ABOUT THE RESPONDENTS VISIT

1. Are you currently a resident of Tobago

No>

Yes>

(GO TO SECTION C)

2. Where are you visiting from? Please specify the city (town), state (county) and country

Country>

Area/State/County>

Town/City>

B. QUESTIONS ABOUT TRAVEL COST

3. Did you travel to Tobago

(i) by Plane?>

READ LIST

(GO TO Q.6)

(ii) on the Ferry from Trinidad?>

(GO TO Q.6)

(iii) on a Cruiseship?>

(iv) by some Other means (please specify)?>

(GO TO Q.6)

4. How many days is the cruise?>
5. and, how many places does your cruise visit?>
6. How long did (will) you stay in Tobago? >
7. What was (is) the main purpose of your visit to Tobago?
Was (is) it: **READ LIST**
- | | | |
|-----------------------------------|--------------------------|---------------------|
| (i) holiday> | <input type="checkbox"/> | |
| (ii) business> | <input type="checkbox"/> | (GO TO Q.10) |
| (iii) visiting family or friends> | <input type="checkbox"/> | |
| (iv) other (please specify)> | <input type="checkbox"/> | |
8. I now want to ask you about what attracted you to Tobago. Please indicate how many of the following reasons influenced your decision to visit Tobago:
SHOW CARD & READ LIST
- | | | | |
|-----------------------------|--------------------------|-------------------------|--------------------------|
| Buccoo Reef> | <input type="checkbox"/> | Climate and Beaches> | <input type="checkbox"/> |
| Culture/heritage> | <input type="checkbox"/> | Diving and snorkelling> | <input type="checkbox"/> |
| Heard about it in Trinidad> | <input type="checkbox"/> | Nature watching> | <input type="checkbox"/> |
| Tranquil/peaceful/relaxing> | <input type="checkbox"/> | Other (please specify)> | <input type="checkbox"/> |
-
9. How important were each of the reasons you have stated. Could you please give your answer as a percentage and make sure your responses add up to 100%.
SHOW CARD & READ LIST
- | | | | |
|-----------------------------|--------------------------|-------------------------|--------------------------|
| Buccoo Reef> | <input type="checkbox"/> | Climate and Beaches> | <input type="checkbox"/> |
| Culture/heritage> | <input type="checkbox"/> | Diving and snorkelling> | <input type="checkbox"/> |
| Heard about it in Trinidad> | <input type="checkbox"/> | Nature watching> | <input type="checkbox"/> |
| Tranquil/peaceful/relaxing> | <input type="checkbox"/> | Other (please specify)> | <input type="checkbox"/> |
-
10. Was (Is) this your first visit to Tobago? Yes> (GO TO Q.12) No>
11. How many other times have you visited Tobago in the past 5 years?

C. QUESTIONS ABOUT THE BUCCOO REEF MARINE PARK

Buccoo Reef and Bon Accord lagoon provide a home to 70 fish species, 39 coral species, numerous other marine animals, as well as the ecologically important turtle grass and mangroves. *(show pictures of healthy reefs, variety of fish life)*. Although on a typical day, a visitor to Buccoo Reef Marine Park would probably see 22 species of tropical fish and 10 species coral, with water visibility averaging about 6 meters.

In recognition of its importance, the Buccoo Reef/Bon Accord Lagoon area has been designated a marine park. However some areas of this Marine Park have already been damaged *(show pictures of over-used parts of the reef)* by both human activities and natural events. There are usually about 180 visitors to Buccoo Reef Marine Park daily.

The variety and diversity of fish, corals and other marine life forms in Buccoo Reef Marine Park could be reduced if the Park is not protected from further stress. Better protection could be achieved through good management and increased enforcement of existing laws. However, it may be that the only way to pay for this is through the creation of a Trust Fund financed through a NEW marine park entrance fee. This NEW fee would be used exclusively for the management and protection of Buccoo Reef Marine Park. It would only apply to Buccoo Reef Marine Park, other marine parks in Tobago may also ask for entrance fees. The fee would be additional to what you would pay for reef tour operator services.

ASK EITHER 12a OR 12b

VISITORS ONLY

12a. Did (Will) you visit Buccoo Reef Marine Park on this trip? Yes> No>

RESIDENTS ONLY

12b. Have you visited Buccoo Reef Marine Park in the past 5 years? Yes> No>

13. Which of the following attributes of Buccoo Reef Marine Park did (do you think) you (would) enjoy most, you can give more than 1 answer:

READ LIST

- (i) the variety of tropical fish and corals>
- (ii) good water visibility so you can see clearly the reef and the fish>
- (iii) no more than 180 other people at the site>
- (iv) some other attributes(please specify)>

14. Please rank the importance of the attributes you have chosen, by giving your answer as a percentage, making sure your responses add up to 100%.
- (i) the variety of tropical fish and corals> _____
- (ii) good water visibility so you can see clearly the reef and the fish>_____
- (iii) no more than 180 other people at the site>_____
- (iv) other attributes> _____
15. Are you in principle willing to pay to protect Buccoo Reef Marine Park?
No> (GO TO Q.16) Yes> (GO TO Q.17)
16. What is your main reason for stating no? **DO NOT PROMPT ONLY TICK ONE REASON**
- (i) I think the Government should pay from existing taxes> (GO TO SECTION D)
- (ii) We don't pay for national park in our country> (GO TO SECTION D)
- (iii) I can't afford the extra payment> (GO TO SECTION D)
- (iv) I don't think that conservation is important (in general)> (GO TO SECTION D)
- (v) I don't think that Buccoo Reef is worth conserving> (GO TO SECTION D)
- (vi) Other> (GO TO SECTION D)
17. Would you be willing to pay TT\$24 (US\$4, £2.40, DM.6,86, CAN\$5.33) as an entrance fee each time to enter and use Buccoo Reef Marine Park in addition to the reef tour operators fee?
Yes> (GO TO Q.18) No> (GO TO SECTION D)
18. If part of this fee went towards developing an interpretive/educational facility for visitors, providing permanent moorings for boats within the park, and developing permanent trails within the park would you be willing to pay more than the amount you have stated? Yes> No>
19. Could you please say why you would pay.
Is it: **SHOW CARD AND READ LIST**
- (i) your personal use of the Marine Park during this visit>, _____ or
- (ii) the option for you or your children to use the marine park one day in the future>, _____ or
- (iii) the existence of the Marine Park as a national treasure even though you/your family may never visit it (again)>_____
- You can give more than 1 reason.

20. Please rank the importance of the reasons you have stated, by giving your answer as a percentage and making sure your responses add up to 100%.

SHOW CARD

- (i) Your personal use of the Marine Park during this visit>_____
- (ii) the option for you or your children to use the marine park one day in the future> _____
- (iii) The existence of the Marine Park as a national treasure even though you or your family may never visit it (again)>_____

D. THE WIDER PICTURE

In addition to being a valuable recreational site, Buccoo Reef Marine Park generates investment and Government revenues for Trinidad and Tobago; provides jobs, business opportunities and income for the local community; and provides important ecological services as it supports the fisheries industry and conserves local and regional bio-diversity.

21. In your opinion, how important are each of the following 3 functions of Buccoo Reef Marine Park:

READ LIST AND SHOW CARD

- (i) generating investment and Government revenue for Trinidad and Tobago>_____
- (ii) providing jobs, business opportunities and other benefits to the local community>_____
- (iii) maintaining the reef ecosystem in its current state> _____

22. As before please rank the importance of the reasons you have stated, giving your answer as a percentage and making sure your responses add up to 100%.

SHOW CARD

- (i) generating investment and Government revenue for Trinidad and Tobago>_____
- (ii) providing jobs, business opportunities and other benefits to the local community>_____
- (iii) maintaining the reef ecosystem in its current state> _____

E. PERSONAL INFORMATION

We need some information about you so we can generate meaningful results for all kinds of people.

23. Are you a member of or do you contribute to any environmental or conservation organisations? Yes> No>
24. What is your age?

25. What is the highest level of education that you have completed: primary school, high school, or university? _____

26. Could you please indicate which of the following categories best describes your personal annual income before tax

SHOW PROMPT CARD

- | | | | |
|----|-----|---------------------------|--------------------------|
| 1 | (a) | less than US\$5,000> | <input type="checkbox"/> |
| 2 | (b) | US\$ 5,001 - US\$10,000> | <input type="checkbox"/> |
| 3 | (c) | US\$10,001 - US\$15,000> | <input type="checkbox"/> |
| 4 | (d) | US\$15,001 - US\$20,000> | <input type="checkbox"/> |
| 5 | (e) | US\$20,001 - US\$25,000> | <input type="checkbox"/> |
| 6 | (f) | US\$25,001 - US\$30,000> | <input type="checkbox"/> |
| 7 | (g) | US\$30,001 - US\$35,000> | <input type="checkbox"/> |
| 8 | (h) | US\$35,001 - US\$40,000> | <input type="checkbox"/> |
| 9 | (i) | US\$40,001 - US\$45,000> | <input type="checkbox"/> |
| 10 | (j) | US\$45,001 - US\$50,000> | <input type="checkbox"/> |
| 11 | (k) | US\$50,001 - US\$100,000> | <input type="checkbox"/> |
| 12 | (l) | over US\$100,001> | <input type="checkbox"/> |

Thank you very much for your time and co-operation. Any additional thoughts or comments are welcome. Please add them here:

Enumerator evaluation of quality of response:

1. P 2. F 3. G 4. VG

END OF QUESTIONNAIRE

A P P E N D I X 3

Informal Business Vendor questionnaire

Appendix 3: Informal Business Vendor questionnaire

UNIVERSITY OF EAST ANGLIA & UNIVERSITY OF THE WEST INDIES INFORMAL SECTOR BUSINESS SURVEY

Social Benefits from Buccoo Reef Marine Park

This is strictly confidential I do not need to know your name or your address.

Questionnaire No.: IBS Interviewer: _____

Time and Date: _____ Location: _____

Respondent:< M / F> _____ Type of outlet: street/booth/mobile _____

1. Name of business (optional - if any)
2. What sort of business are you involved in/what products do you sell?

3. Do you have any other sales outlets? 1 < > Yes 2 < > No
4. Do you employ anyone else or do any other members of your family or friends help you run the business or make the products?
No. of people employed - paid < >
No. of family members - unpaid < >
Anybody else (describe) < > _____
5. Do you have any other jobs or businesses. If yes, explain...

6. Are there other breadwinners in your household? 1 < > Yes 2 < > No
7. How important is this business to your total household income:
 - 1 < > only source of income (at least 80% of household income)
 - 2 < > important source of income (50-80% of household income)
 - 3 < > secondary source of income (20-50% of household income)
 - 4 < > minor source of income (10-20% of household income)
 - 5 < > not important at all (less than 10% of household income)

7. How many days a week does your business operate/do you trade?
 days a week < >
 and how many hours each day do you trade? hours a day < >
9. How many additional days/hours a week do you spend manufacturing, or acquiring, what you sell?
-
10. How long have you been operating this business?
 1 < > less than 1 year?
 2 < > 1 - 2 years?
 3 < > 3 -5 years?
 4 < > more than 5 years?
11. Over this period has the contribution that this business makes to your household income:
 1 < > increased
 2 < > been stable, or
 3 < > decreased?
12. Why has the contribution from this business to your household income changed?
-
13. Over this period, have there been any other significant changes to your business, such as where you do business, moving to a new site, the type of clients, or the type of business you are involved in?
-
14. Where do you obtain what you sell?
 1 < > make it yourself
 2 < > family make it/obtain it for you
 3 < > buy goods from someone else
 4 < > harvest goods yourself
 5 < > pay others to obtain/make what you sell
 6 < > other (specify).

15. What proportion of the cost of making your product constitutes materials from Trinidad or imports from elsewhere?

0 - 20%	<	>
20 - 40%	<	>
40 - 60%	<	>
60 - 80%	<	>
80 - 100%	<	>

16. Who are your major customers?

1	<	>	locals (Tobago)
2	<	>	locals (Trinidad)
3	<	>	foreigners

17. What months of the year do you consider to be the busiest months for your business/your peak season?

Jan / Feb / Mar / Apr / May / Jun / Jul / Aug / Sep / Oct / Nov / Dec

18. Does any of your business activity have to do with Buccoo Reef? 1< >Y 2< >N

19. If yes, in what way? _____

20. What percentage of your customers are tourists?

	peak season		low season?	
0 - 20%	<	>	<	>
20 - 40%	<	>	<	>
40 - 60%	<	>	<	>
60 - 80%	<	>	<	>
80 - 100%	<	>	<	>

21. The Tourism Master Plan says that there could be another 60,000 tourists here each year in the next 5 years. How do you think this will change your business, or change the way you do business?

22. What are your average monthly sales in peak season and in low season?

	peak season		low season	
under TT\$1,000	<	>	<	>
1,000 - 2,000	<	>	<	>
2,000 - 3,000	<	>	<	>
Over 3,000	<	>	<	>

23. What are your average monthly expenses in peak season and in low season?

	peak season		low season	
under TT\$1,000	<	>	<	>
1,000 - 2,000	<	>	<	>
2,000 - 3,000	<	>	<	>
Over 3,000	<	>	<	>

24a. Do you have any concerns about changes in the tourism industry which could have a negative impact on your business activity?

24b. What would you like to see happen in the tourism industry which would have a positive impact on your business activity?

25. Where do you live: Bethel/Black Rock/Bon Accord-Canaan/Buccoo /Carnbee/Hampden/Lambeau/Lowlands/Milford Court/Mt Pleasant/Plymouth/Scarborough/other

26. Do you think you are in the best location to maximise your sales?
 1 < > Yes 2 < > No

27. Would you use permanent facilities (such as vendor lay-by's, or booths) rented on a lease from the Government, if these facilities were somewhere else?
 1 < > Yes 2 < > No

A P P E N D I X 4

Moderators notes from second focus group meeting:
to elicit weights

Appendix 4: Moderators notes from second focus group meeting: to elicit weights

All text in **bold** was read, all text in italics were questions that were asked and then discussed, all text in CAPITALS describes actions taken by the researchers at the meeting.

WELCOME AND INTRODUCTION: EXPLAIN WHO WE ARE, WHERE WE ARE FROM, WHY WE ARE HERE AND WHAT WE HOPE TO ACHIEVE TONIGHT. ASSURE THE STAKEHOLDERS THAT CONFIDENTIALITY IS GUARANTEED. NOTE-TAKING IS ONLY TO RECORD OPINIONS ACCURATELY, NO NAMES WILL BE USED IN ANY WAY.

HANDOUT TEXT SUMMARY OF COMMENTS TO EACH PARTICIPANT AND VERBALLY REVIEW WHAT OTHER GROUPS THOUGHT ABOUT BUCCOO REEF.

Question 1. In the first round meeting there seemed to be general agreement that the biggest problem for Buccoo Reef Marine Park was poorly treated waste water, and there was general concern about water quality. Is this a fair summary of what you said?

Question 2. Do you think there are any other major causes of damage (direct or indirect) to Buccoo Reef Marine Park? If, yes, what are they?

Remember - this question asks ‘what’ are they, not ‘who’ are they!

Question 3. What do you think is the first thing that should be done to keep Buccoo Reef Marine Park healthy?

**We will now present to you the results of the votes from the other groups:
PRESENT VOTES FROM OTHER STAKEHOLDER GROUP MEETINGS.**

Question 5. Does it surprise you how the other groups have voted? Why?

Question 6. I would now like to ask you to vote again. Please now vote on which criteria you think is the most important for the management of Buccoo Reef Marine Park. In the first column you can vote by putting the number 1 next to the group of issues that you consider to be the most important (whether that is the economic issues, the social issues, or the ecological issues), [WAIT FOR PARTICIPANTS TO DO THIS] then please write the number 2 next to the group of issue you feel to be 2nd most important [WAIT FOR PARTICIPANTS TO DO THIS] , and the number 3 next to the group of issues you think are the least important to you.

Question 7. Can I now ask you to look at the next column. We now want you to vote. To say exactly what you want for yourselves and SW Tobago. Do you want more economic benefits, more jobs, more access, better water quality?

You have 10 votes (sticky labels) which you can put beside any or all of the 3 criteria. If you feel that only one issue is important, for example economic issues, you can put all your 10 sticky labels next to that one [SHOW EXAMPLE]. Alternatively you may feel that one criteria is most important but there are other criteria which are also important, for example, 5 stickers on ecological, 3 on social and 2 on economic benefits. You can vote however you want. BUT while you are doing this, please think about what you want done as a priority issue and put the most stickers beside that.

Question 8. Having voted do you wish to change your rank ordering of the management issues? You can change them now.

[To the Assistant Moderator] Do you have any points of clarification you require from the group?

Assistant Moderator asks group for clarification where is necessary

[To the Assistant Moderator] Could you now please summarise the discussions that have occurred, and this groups' responses to the questions.

[To the group] Please could you listen to the Assistant Moderator, and correct him if you believe his records are inaccurate.

Assistant Moderator summarises the discussions

Thank you very much for attending. The next stage in this process is to hold a consensus building workshop where I hope 3 of you will be willing to meet with us again. That will be on Tuesday 23rd March. Could you please tell me the names of those who will attend. It will be at Rovanel in the evening from 5.30pm - 8.30pm, this is to allow those who work to make it to the session. All the stakeholder groups will attend this meeting including the 4 Secretaries from the THA.

Thank you again for your time and participation.



Trade-off Analysis for Participatory Coastal Zone Decision Making

Katrina Brown, Emma Tompkins, W. Neil Adger

This manual provides a complete guide on how to undertake the trade-off analysis approach for participatory coastal zone decision making. Trade-off analysis is an inter-disciplinary tool that can provide support to decision makers. It is an approach that draws on stakeholder analysis, multi-criteria analysis and consensus building techniques.

The accessible and cross-referenced material is designed as a practical field guide that can be used by government resource managers, extension workers, and non-government organisations to implement a process of participatory decision making. The manual can also be used to inform decision-makers about the potential for and scope of participatory decision-making for coastal zone management.

Key features

- Step by step process takes the reader from the beginning to the end of the trade-off analysis process, all information necessary is contained in the manual.
- Contains useful chapters describing how to undertake stakeholder analysis, multi-criteria analysis and consensus building.
- A case study of Buccoo Reef Marine Park in Tobago is used to illustrate and expand upon techniques used and implementation issues.
- Contains practical questionnaires that can be used as templates for other studies.
- Provides references for additional sources of information both in print and on the Internet.

Katrina Brown is a Senior Lecturer in the School of Development Studies, Emma Tompkins is a Senior Research Associate in the Centre for Social and Economic Research on the Global Environment, and W. Neil Adger is a Lecturer in the School of Environmental Sciences, all at the University of East Anglia, Norwich, U.K.