Valuing the Environment in Small Islands

An Environmental Economics Toolkit

JOINT NATURE CONSERVATION COMMITTEE

OTEP

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Cover photograph:
Harvesting of seaweed in the Solomon Islands
by Pieter van Beukering

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Introduction

the importance, role and framework of environmental valuation

Photo: Dreamstime.com

Context

In 2007, three UK Overseas Territories – Bermuda, the Cayman Islands and Montserrat – were awarded funding by the Overseas Territories Environment Programme (OTEP) to conduct environmental valuation studies. All three Territories aim to use valuation to demonstrate the benefits of the environment for human wellbeing, and to support more sustainable decision making in small islands. These valuation studies cover a variety of issues and ecosystems typical to small islands; the contexts include marine, coastal, inland mangrove wetland, and forest ecosystems, located in Territories with varying levels of development[1]. The Territories face a range of pressing challenges that environmental valuation can help to address, thereby supporting the sustainable development goals articulated in their Environment Charters[2].

Although a large number of guides already exist on aspects of environmental valuation, none of these references specifically focus on the issues and needs of small islands. This toolkit was developed to address this gap. Its core aim is to provide a practical resource to meet the pressing needs of a group of pioneering stakeholders in Bermuda, the Cayman Islands and Montserrat who will lead valuation studies, but have no, or only limited, knowledge of environmental economics. In addition, the toolkit is designed to be of use to a wider audience of stakeholders in small islands around the world who wish to learn about practical aspects of environmental valuation, but struggle to find a reference adapted to small island contexts.

The development of this toolkit was jointly funded by OTEP and the Joint Nature Conservation Committee (JNCC). OTEP is a joint programme of the UK Government Foreign and Commonwealth Office and the Department for International Development to support the implementation of the Environment Charters and environmental management more generally in the UK Overseas Territories. JNCC is the statutory adviser to the UK Government on UK and international nature conservation, including in the UK Overseas Territories.

[1] For more details on the UK Overseas Territories valuation projects see: **http://www.ukotcf.org/OTEP/docs/OTEP2007PROJECTS.pdf**

[2] For more details on the UK Overseas Territories Environment Charters see: **http://www.ukotcf.org/OTEP/docs/general_brochure.pdf**

1 Introduction
the importance, role and framework of environmental valuation

What you will learn in this section:

- Why valuation of the environment can be useful in small islands
- The role of economic valuation in ecosystem management
- The basic framework of analysis for economic valuation
- How to use this toolkit

1.1 How can environmental valuation be useful in small islands?

Money speaks louder than words. Therefore, putting a monetary value on environmental and social impacts usually increases the chance of these effects being taken into account in decision making.

Success stories

In numerous cases, economic valuation studies proved to be the crucial step towards more sustainable development in small islands. For example:

- Valuation studies demonstrated that *self-financing* is a viable option in many Caribbean protected areas, especially those that attract large numbers of visitors. Several protected areas now have effective revenue generation strategies, and as a result are among the best managed in the region. The most successful cases in the region include Nelson's Dockyard National Park (Antigua), Bonaire and Saba Marine Park, Brimstone Hill Fortress National Park (St. Kitts), and Pigeon Island National Park (St. Lucia). Economic valuation played an important role in the establishment of these self-funded systems (e.g. Dixon et al. 1993).
- Monetary damage estimates (from economic valuation studies) were included in the legislation of penalties per square metre of coral reef damaged in the Florida Keys for reasons of *damage compensation*. Similar monetary penalties are also going to be introduced in the State of Hawaii. In both cases, the penalties are based on valuation studies (Leeworthy 1997; Cesar et al. (2001)).
- Economic valuation studies have contributed to the government of the Republic of the Marshall Islands considering a *moratorium on near-shore dredging* in Majuro Atoll. By valuing the true cost of aggregate mining activities in Majuro Atoll, it was shown that the damage from unsustainable mining in terms of lost coastal protection services is approximately US$52 per m^3. These economic damage costs are far higher than the costs of only US$36 per m^3 for aggregate obtained from more sustainable offshore sites in Majuro Lagoon (McKenzie et al. 2006).

Lagoon dredge, Majuro Atoll. Photo: Emily McKenzie

The purpose of this toolkit is to show how the value of the environment can be estimated and incorporated into decisions. Specifically, it is designed to help government officials and other stakeholders recognise the value of ecosystems and ecosystem services that might be affected by their decisions and how changes to the environment will affect the longer-term sustainable development of the island.

Ecosystems and ecosystem services
An ecosystem is a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit. Ecosystem services describe the benefits that ecosystems provide to people.
Source: Millennium Ecosystem Assessment

definition

Reasons to value the environment

Understanding the economic value of the natural environment is only one of the required elements in making good decisions about projects and policies that affect the environment. However, it can help to make the trade-offs involved more explicit. There are many reasons why an economic valuation study can be extremely useful, including:

- To raise *awareness* of the value of the environment as part of a project appraisal;
- To generate a value for the environment to be used for *policy advocacy*;
- To reveal the *distribution* of costs and benefits of projects among winners and losers;
- To design the most effective tools for environmental *management*;
- To design appropriate *charging* rates for environmental use;
- To design the best method to *extract finances* from environmental goods and services;
- To calculate possible *returns on investment*;
- To compare *costs and benefits* of different uses of the environment; and,
- To calculate damages for *compensation*

.

Is yet another toolkit really needed?

Existing economic valuation guidelines offer methods to assess the total economic value of ecosystems and the goods and services they provide. None of these other guidelines, however, focus on the issue of valuing ecosystems that are unique to small islands, or provide a set of case studies and examples that are relevant to small islands. Similarly, none of the existing guidelines provide tailored assistance on how to undertake economic valuation with limited resources and limited capacity. This toolkit was developed to address this gap.

1.2 The role of economic values in ecosystem management

Economic valuation is simply a technique to reveal how valuable the natural world is to us. Generating an economic value for the natural world begins with an understanding of all the different services that the environment can provide. In order to identify ecosystem services at the beginning of a valuation study, it can be useful to group them into four categories:

- Providing services to enable people to make a living (e.g. fisheries and forestry, both subsistence and commercial);
- Supporting human life (e.g. potable water and clean air);
- Regulating other important ecosystems (e.g. sea grass beds and mangroves which act as a nursery for juvenile fish); and,
- Having cultural significance and providing opportunities for recreation (e.g. the importance and meaning of land in some Pacific and Caribbean Islands).

Often, decisions to support economic development affect the functioning or quality of ecosystems. Although such decisions can potentially enhance short-term development, they can also reduce the supply of ecosystem services that are critical to human wellbeing and sustainable development.

Placing a monetary value on the environment

Every time we make a decision that affects the way in which the natural environment functions we are implicitly putting a value on the environment. If we choose to clear land for agricultural development, or to develop new tourism facilities, then a trade-off is made between the ecosystem services that we will forgo and the benefits that will accrue under the new development. Economic valuation of affected ecosystem services makes that trade-off explicit. Valuation reveals very clearly to decision makers what will be lost by making that decision, and how the loss will affect human well-being in the short- and long-term.

For most goods or services that we buy, we make decisions based on the price of those items. The price of the items is dictated both by their *scarcity* (think of the difference in the price of Beluga caviar which is extremely scarce, and bread which is not at all scarce) and the *demand* for those items (think of house prices going up in neighbourhoods where many people want to buy a house and house prices falling in neighbourhoods where very few people want to live). Prices reflect the supply of the good and our demand for it.

For ecosystem services and the natural environment, there are often no prices that reflect their value, as the goods and services that are provided are not traded on markets e.g. clean air. As a result we tend not to take the value of ecosystem goods or services into consideration when we make decisions that affect the natural world. When we investigate the implications of projects, such as constructing hotels, dredging for aggregate, or building a new marina, we need to fully understand the environmental as well as the financial implications of this decision. Economic valuation puts a price on ecosystem goods and services and hence reveals clearly the trade-offs that have to be made.

Demand: house prices in popular neighbourhoods are higher than prices for similar houses in less popular parts of town

Economic valuation in small island contexts

Under pressure to respond to immediate problems, but hampered by a lack of high quality information and analysis, policy makers in small islands often have to make quick decisions without full knowledge of the long term implications of their decisions. Having access to reliable information that describes the costs, values, and risks of environmental change facilitates more objective, more transparent and more informed decision making. Such information should reduce the pressure on decision makers by giving them a fuller and more balanced understanding of the economic gains from environmentally sustainable policies, projects and decisions, and the potential losses from unsustainable ones.

Economic valuation does not provide the 'correct' answer, but it does provide information to facilitate more objective decision making, therefore it should always be undertaken within the context of sustainable development. The long term economic, social, and environmental impacts of decisions should always be taken into account, not just on the immediate winners and losers, but also on people and the environment downstream, and future

generations. Using economic valuation in this context reveals trade-offs that will bring the greatest benefits, and hence are more likely to enable sustainable development.

1.3 Framework for analysis

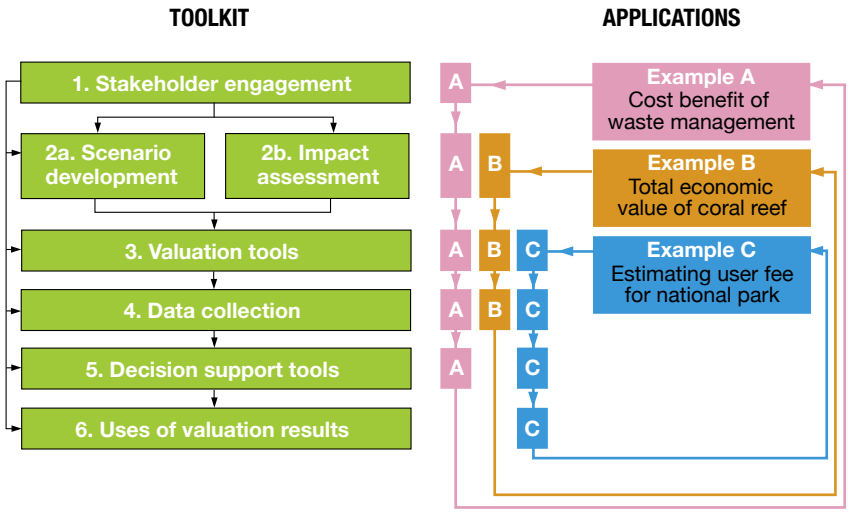
Before explaining the process of economic valuation in the small-island context, two important caveats should be remembered:

- Economic valuation is *just one element* in a decision process, along with a number of other steps that require expertise beyond the economic domain. Although the emphasis of this toolkit is on economic valuation, these other crucial elements in the decision process are also briefly explained.
- Because economic valuation is done for a variety of reasons in a variety of conditions and contexts, it is difficult to present a *uniform framework* for the economic valuation of environmental impacts for projects or policies. In other words, each new project or policy to be studied may require a slightly different approach from the previous study.

Main steps in economic valuation

Keeping these two caveats in mind, the sequence of main steps in an economic valuation and decision making process is presented in Figure 1.1.

Figure 1.1 Framework for economic analysis with several examples of applications



Step 1. Stakeholder engagement: Economic valuation focuses by definition on people's preferences. Without people, environmental goods and services do not have an economic value. Therefore, economic valuation generally requires the involvement of stakeholders at various stages of the analysis. By engaging stakeholders from the start, the final result of the economic valuation study will also be more acceptable to them. The different steps in which stakeholders may be involved include (see Chapter 3 for more details):

- *Scenario development*: stakeholders share their views on possible alternatives/futures;
- *Data collection*: stakeholders are often the main source of information;
- *Valuation methods and decision support tools*: stakeholders may be asked about their preferences in trading-off different goods and services;
- *Economic instruments*: stakeholders can share their ideas on the type of economic instrument that could be used to extract financial resources for environmental management.

Next, two steps take place simultaneously and interchangeably. These steps are scenario development (step 2a) and impact assessment (step 2b).

Step 2a. Scenario development: Economic valuation is often undertaken to influence a decision or policy. It therefore involves the evaluation of a proposed policy, project or other form of intervention. To determine the attractiveness of the proposed intervention, it is required to compare the economic feasibility of the project or policy with an alternative situation. Sometimes, the alternative involves a situation "without" the project, describing the development of the main economic, social and environmental criteria if the project is not implemented (i.e. the baseline). In other cases, the alternative involves an actual alternative project or intervention, which may also lead to changes in costs and benefits. The process of defining these alternatives is called scenario development. Be aware that without proper identification of the most relevant scenarios, the whole economic analysis may fall short in advising decision makers. Chapter 4 will elaborate this step in detail.

Step 2b. Impact assessment: After determining the scenarios, the physical impacts of each alternative need to be determined. This "impact assessment" is a process that identifies, predicts and assesses the consequences of a project or policy. Impact assessment generally generates a wide range of mostly physical data of varying nature (i.e. environmental, economic, social and cultural). The process of impact assessment is described in general terms in Chapter 4.

Step 3. Economic valuation: Economic valuation converts the physical effects identified in the impact assessment into monetary units. In this way, the range of different effects is made comparable. Because economic valuation aims to measure the wealth provided by the environment in terms of human consumption and production, the valuation is purely derived from people's preferences. The economic valuation methods developed to estimate the value of changes in the provision of environmental goods and services caused by a project or intervention are described in Chapter 5.

Step 4. Economic surveying to collect data: Although economic surveying is formally an integral part of economic valuation, we treat it separately in this toolkit because it has distinct practical implications for the economic study. Typical methods of gathering information from people include focus group discussions, key-informant interviews and household surveys. These techniques are explained in Chapter 6.

Step 5. Decision support tools: Various methods are available to combine the individually valued impacts into a single measure of each scenario's value, in order to assist the decision making process. These methods include cost-benefit analysis, multi-criteria analysis, and cost effectiveness analysis. These methods are called decision support tools or evaluation techniques. Note that evaluation techniques are different from valuation techniques because the latter values specific impacts in monetary terms, while the former combines the values in order to compare alternative scenarios. The most relevant evaluation techniques are explained in Chapter 7.

Step 6. Using valuation to influence decisions: By and large, the main reason to generate information on environmental values is to influence policy decisions about the economy, society or the environment. Valuation can be used for a number of purposes: for general advocacy; to influence specific decisions; to ensure appropriate levels of compensation for environmental damage; and, to alter incentives and extract financial revenues using economic instruments. In Chapter 8 we discuss the typical key messages, typical audience, valuation data and communication tools that are likely to be most useful and relevant for each of these different goals.

When to apply what?

You may wonder whether an economic valuation study necessarily involves all of the above steps. This is not necessarily the case. The steps that are included in the economic valuation exercise depend on a number of factors:

- The level of ambition and expected rigour of the study;
- The required level of local support for the final results;
- The budget and time available to complete the study; and most importantly,
- The goal of the valuation study.

As mentioned in Section 1.1, economic valuation can serve numerous goals, varying from policy advocacy of the economic importance of an ecosystem to calculating the appropriate user fee for a national park. In all cases, step 3 (economic valuation) and step 4 (data collection) will be mandatory. However, the preceding and subsequent steps are not always needed. This is illustrated with three examples with a varying level of comprehensiveness in the right hand side of Figure 1.1.

- *Example A* shows a comprehensive economic valuation study including a cost-benefit analysis of decisions in the field of waste management. The example concerns the choice of waste processing (such as incineration versus landfilling) to be implemented. Because the analysis will require extensive participation and cooperation from local communities and policy makers, stakeholder engagement is a necessary first step. The physical implications are also quite different between both options and therefore require accurate impact assessment and scenario analysis. Because the final choice will be based on the trade off between costs and benefits, decision support tools will also be used.
- *Example B* presents an economic valuation, which is mainly aimed at policy advocacy. In this example, the Total Economic Value (TEV) of coral reefs is estimated to demonstrate the economic importance of this threatened ecosystem. Because the outcome of the study has no direct implications for local communities, stakeholder engagement is not a priority in this study. Yet, the TEV is particularly meaningful if it compares a situation with and without conservation of the reef ecosystem. For this purpose, an elaborate impact assessment is required. The study can do without decision support tools, since the TEV of the "with and without" scenario has meaning in itself already.
- *Example C* illustrates a relatively simple valuation exercise that aims to determine the appropriate level of user fee for a national park. This will involve a survey among visitors of the national park in which respondents will be asked about their maximum willingness to pay for contributing to conservation of the reserve. The first two steps will not necessarily be required, although some stakeholder engagement may be advisable to get the support of tour operators and park managers. To introduce the planned user fee, an efficient payment system with minimal overhead costs will be needed. This stretches the economic valuation study all the way to the final step of using the results to design payment mechanisms.

Girl pouring water, Kiribati. Photo: Marc Overmars

1.4 How to use this toolkit

Who should use this toolkit

This toolkit provides information, ideas, tools and techniques for those who want to include the value of the environment in decisions but do not know where to begin. It is written to assist those with little knowledge of, or exposure to, environmental economics or valuation tools. It is primarily aimed at government officials, policy makers, and researchers on small islands who would like to learn more about environmental valuation methods. Specifically, it should assist non-economists in government and NGOs wanting to influence policy and decisions on environmental management. Those with some basic knowledge of environmental valuation techniques may find it useful to help them conduct, manage and/or use economic analysis in their jobs. Others may find it useful as a basis on which to hire and steer consultants, and indeed decide when outside consultants should be used. The toolkit may also be useful for those teaching courses on cost-benefit analysis or environmental economics on small islands.

Hiring consultants to undertake an economic valuation
If you do not feel confident to undertake an economic valuation study alone, there is a template terms of reference for consultants that is described in Chapter 9. This can be adapted as necessary to meet your needs. Go to Section 9.2 for more details.

Structure of the toolkit

Some other learning aids are used throughout the toolkit. These include:

- *Conceptual framework* – each Chapter begins with a diagram showing the reader how far they have progressed in undertaking an economic valuation exercise.

definition

Definition boxes remind the reader of important definitions. Key terms and concepts are defined for those unfamiliar with economics or valuation terminology.

example

Example boxes are used throughout the toolkit to illustrate a point or to provide details of an aspect of a particular case study.

information

Information boxes provide references to other sources the reader can go to for further information.

'Go to' indicators point the reader to places of related interest in the toolkit.

- *Visual representations* are scattered throughout the toolkit, these are small cartoons summarising the content of the section.
- *Glossary* – technical words in the text are defined in the glossary at the end of the toolkit.

2

Why do small islands require special consideration?

Photo: Praveen Wignarajah

2 Why do small islands require special consideration?

What you will learn in this section:

- The uniqueness of small island ecosystems
- Typical environmental challenges in small islands
- Typical economic development options and challenges in small islands
- Challenges associated with decision making on small islands

2.1 Introduction

definition

Small Island Developing States (SIDS)
Coastal countries that share similar sustainable development challenges, including small population, limited resources, remoteness, susceptibility to natural disasters, vulnerability to external shocks, and excessive dependence on international trade. Their growth and development is also held back by high transportation and communication costs, disproportionately expensive public administration and infrastructure due to their small size, and little to no opportunity to create economies of scale. Currently, fifty-one SIDS and territories are included in the list used by the United Nations Department of Economic and Social Affairs in monitoring the sustainable development of SIDS.

Many small islands are located in the tropics and hence are influenced annually by significant climate variability, whether in the form of tropical cyclones as in the Caribbean, Pacific and Indian Oceans; by winter storms, as in the Atlantic Ocean; or by dust storms, flooding, heat waves, and droughts. There are many small islands that also experience seismic phenomena, notably, earthquakes, volcanic eruptions and tsunamis. Most small islands have developed a natural resilience to these events and island species re-colonise areas with remarkable rapidity after such events occur. However, the combined pressure of human activity and natural hazards weakens the natural ability of small islands to recover from harmful events. Figure 2.1 describes some of the human and natural pressures affecting small islands.

Small islands exist in a very different context to larger and more geographically connected countries, making them more vulnerable to external shocks and hazards. Nonetheless they also have a unique set of characteristics that assist them in coping with these impacts. This Chapter describes the unique aspects of small island ecosystems, the main economic and environmental challenges faced on small islands, and the decision making realities.

Storm destruction Photo: Cayman Islands' Department of Environment

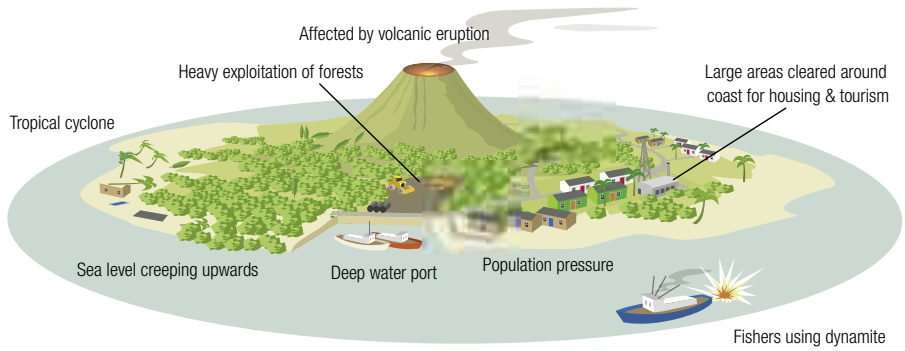


Figure 2.1 The potential pressures on ecosystems on small islands

2.2 Small island ecosystems

Island states cover 40% of the world's oceans (including their Exclusive Economic Zones), and tend to have a higher proportion of coastal area to inland area. For some of the smaller islands, the entire land area is classified as 'coastal'. This is due to the geography (often comprising mangroves, wetlands, sea grass beds, coral reefs and sandy beaches) and the small size of the island. Coastal areas, including estuaries, swamps and marshes, along with tropical rainforests are often noted for their high levels of productivity, see Figure 2.2.

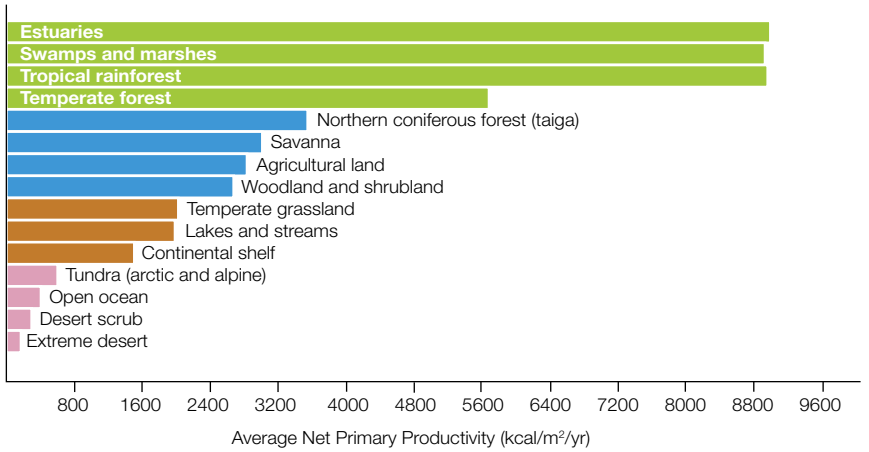


Figure 2.2 Relative productivity of various ecosystems Source: Agardy and Alder (2005)

The isolation of many small islands has meant that there is often a high degree of endemism within these systems, i.e. many species are unique to specific islands. For example, Socotra (an island off Yemen), which has long been isolated from the Yemen mainland, has almost 300 endemic plants, over 30 endemic vertebrates, and more than 300 species of endemic invertebrates. Other such islands with high degrees of endemism include Madagascar, New Caledonia, and the Galapagos Islands. Since 1500, the majority of species extinctions have occurred on island systems, most often due to introduced species affecting habitats, or overexploitation. This trend has changed in recent years - now 50% of extinctions occur on continents as a result of habitat loss and degradation.

Small island ecosystems frequently experience slightly greater stress than those in mainland or larger states, in part due to their isolation, but also due to the interrelationships between terrestrial, coastal and marine ecosystems, as can be seen in highly populated small atolls such as Kiribati and the Marshall Islands. Stressors that affect one ecosystem often have profound implications for other interrelated ecosystems. This adds to the complexity in measuring the economic costs and benefits of adapting landscapes or changing land use as part of project development. Figure 2.3 shows the many elements in a typical island ecosystem.

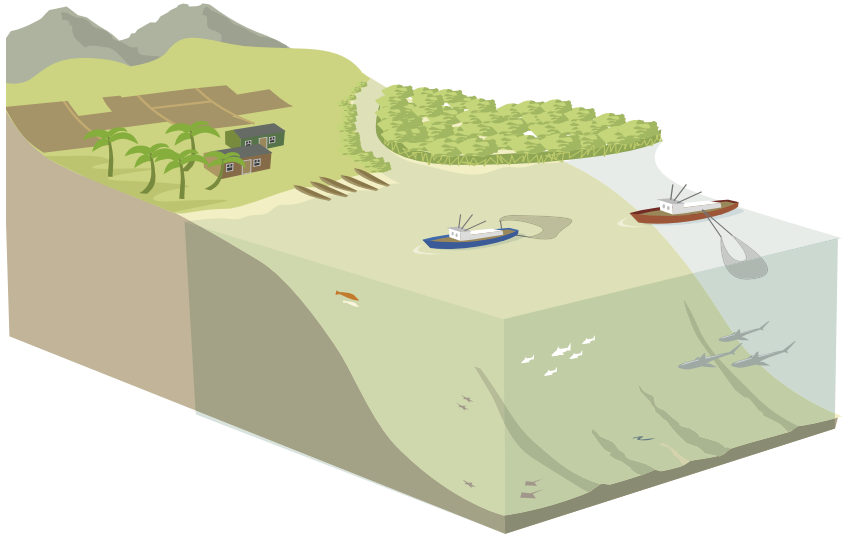


Figure 2.3 Cross section of a small island showing variety of ecosystems, from coastal to mountain Source: Agardy and Alder (2005)

The 'Ridge to Reef' management practice, which takes into account the impact of a project or decision in one part of an island on other parts, has been adopted in several islands (Jamaica, Hawaii, and the Mariana Islands among others). One of the strengths of economic valuation is that it can play a vital role in implementing the 'Ridge to Reef' concept by ensuring that the goods and services provided by all affected ecosystems are taken into account when decisions are made about future developments on small islands.

2.3 Environmental challenges on small islands

The most pressing environmental problems on small islands often relate to human activity. Since the United Nations conference on sustainable development in small islands in 1994 in Barbados, awareness of the pressures on small islands from human activity has grown. Actions taken by small island populations to protect their livelihoods, gather food and diversify incomes all affect the environment, and the future development potential of the island. The main pressures are:

- Land clearance for development (including logging and forest clearance);
- Agricultural and industrial pollutants and run-off;
- Waste from tourism, on land and at sea, notably from cruise ships and domestic waste (including solid waste disposal);
- Invasive alien species;
- Climate change;
- Damaging fishing practices (including poisoning and dynamiting); and,
- Mining and excavation for construction material (including beach mining, reef blasting and near-shore dredging).

Land clearance for development

Forest and woodland cover varies considerably among small island states, from 94% in Suriname to less than 1% in Haiti, although according to the Food and Agriculture Organisation in 1999 small islands are generally well endowed with forests. One of the most environmentally damaging impacts of economic development in small islands is the clearance of natural vegetation. Land clearance, which is frequently required for residential housing, agriculture, industry, infrastructural or tourism development, can lead to high rates of soil erosion. In areas where there is greater vegetation prior to land clearance, there is likely to be more accelerated erosion after clearance. Consequently high tropical islands, surrounded by fringing reefs, with dense vegetation and high rainfall, such as Haiti and the Solomon Islands, are the most at risk from accelerated rates of soil erosion following land clearance. The true cost of land clearance (that considers impacts on future land and ocean productivity) has to be evaluated when estimating the costs and benefits of new development projects.

Agricultural and industrial pollutants and run-off

Industrial developments, agricultural land-use, and household activities can also introduce a variety of pollutants into the coastal environment leading to nutrient enrichment. Algae can quickly overgrow fringing reefs following increased levels of nutrient inputs from untreated, or inadequately treated, sewage, as happened in Barbados, Jamaica, Hawaii, Costa Rica and Panama. Increasing stress is being placed on potable water supplies and coastal ecosystems due to the variety of pesticides, herbicides, heavy metals, oil (from spills), nutrients from sewage and grey water runoff, that adjacent communities and industries typically input into the marine system.

Waste from tourism, on land and at sea

Tourism is central to the economies of many Caribbean, Pacific and Indian Ocean islands, including (but not limited to): Antigua and Barbuda, Aruba, Barbados, St. Lucia, the Bahamas, the British and US Virgin Islands, Jamaica, Fiji, Guam, Saipan, Cook Islands, New Caledonia, French Polynesia and the Maldives. Tourism and tourism related activities generate both solid and liquid waste. There are many detailed examples of the damages caused by releasing inadequately treated waste onto land and sea (such as Hawaii, Jamaica, and Trinidad and Tobago), and the impacts of solid waste dumping on land (Fiji, Madagascar, Samoa, and the Cook Islands). Projects are being undertaken to address the issue of waste management in many islands, including recycling initiatives in the British Virgin Islands and Puerto Rico; and the provision of central waste collection areas where waste is sorted (as in the Maldives).

Invasive alien species

Changing populations and increased demand for imported resources contribute to small islands' susceptibility to invasion by alien species. Alien species include plants, animals, reptiles, fish and disease-causing pathogens. They can harm human and animal health, affect livelihoods, and threaten biodiversity. Many small islands already face threats from invasive alien species. Changing climatic conditions potentially hasten the spread of new alien species, including those that could become the next bio-invasion. Managing this problem requires preventative actions, including surveillance and early response. Through this approach, some islands, such as Mauritius, have effectively started to eliminate invasive mammals (Norway rats, hares, ship rats, mice and rabbits) and reintroduce native species.

Climate change

Climate change will affect every country on the planet, through rising air temperature; rising sea levels; acidification of the oceans; rising sea temperatures; changing precipitation levels; and changes in the incidence and intensity of extreme weather events such as storms, floods and droughts. A rise in temperature of between 1.5°C and 4°C may not sound like a problem, however, this can bring about significant shifts in ecosystem health and functioning. For example, coral reefs thrive in warm oceans between 23°C to 25°C but their health is in jeopardy when sea surface temperatures rise above (or drop significantly below) this range. Perhaps most importantly for small islands, climate change will contribute to the thermal expansion of the oceans – this means that the sea level will rise. Small low lying islands will lose land in this process, adding additional pressure to scarce resources.

Damaging fishing practices (including poisoning and dynamiting)

Poisoning and dynamiting of fish is increasingly occurring as the financial rewards for certain types of fish increase, and traditional fishing practices are abandoned for various reasons. Small islands suffering the impacts from this type of fishing include Fiji and Tuvalu. Intensive trap fishing within reef areas, as practised in Haiti and Jamaica, has the damaging effect of removing algae eating fish from the reefs, which can lead to an increase in algal cover of the reefs. It is also suspected that hauling in fishing traps can create substantial damage, especially coral breakage.

Mining and excavation for construction material

Many small islands have relied for years on beach sand to provide aggregate for construction. The recent trend towards more concrete homes is leading to a significant withdrawal of sand from beaches in many small islands. For example, since the 1980s there has been significant sand mined for tourism construction in Tobago. Positive moves to manage this problem can be seen in Puerto Rico where there is a total ban on all sand mining from beaches, and in Guyana, which has imported sand for all government projects since 1994.

The big challenge of multiple stressors

While periodic natural events, including hurricanes, earthquakes, drought and floods occur frequently in some small islands, these are not the main environmental problems. The most intractable problems are caused by combinations of multiple human and natural stressors. Costa Rica for example experienced deforestation in the highlands, which led to soil erosion. Coupled with inappropriate agricultural practices, this land clearance contributed to declining reef quality, which had deleterious impacts on both tourism and the fishing sector. St Lucia also experienced problems of increased coastal turbidity following periods of land clearance. In other small islands, the wildlife trade coupled with the introduction of new species to eliminate local species (and the accidental introduction of new species) have added to pressures on small island ecosystems. There are many such examples of development pressures leading to environmental degradation on small islands.

A great strength of economic valuation is that it can be used to identify development options that are resilient in the face of these multiple stressors by highlighting the future costs and benefits of the development options.

2.4 Economic options for development and areas for concern

All nations aim to improve the well-being of their human populations, to grow and develop. Directly as a result of this aim, small islands face a particularly difficult balancing act. They have to find development pathways while conserving their environmental quality, and managing the challenges associated with small size and isolation. Small islands inevitably face at least one of the following challenges:

- Limited land (e.g. limited fertile land for agricultural production in Nauru, New Caledonia and Nukuoro in Federated States of Micronesia; for industrial or commercial development in Montserrat);
- Limited fresh water supplies, especially on low-lying atoll states (such as the Cayman Islands which relies on desalination; and Tuvalu and Kiribati which rely on rain water and limited groundwater);
- Limited means of generating foreign exchange (in some small islands, a large proportion of foreign exchange can come from one source, for example tourism accounts for 70% of foreign exchange in Seychelles and 60% in the Maldives; and Papua New Guinea relies on mineral exports for 72% of export earnings);
- Small domestic markets, a narrow production base and limited potential for economic diversification (e.g. reliance on tourism for 60% of GDP in Bahamas, and 45% in British Virgin Islands; a reliance on overseas remittances e.g. US Government transfers to American Samoa);
- Diseconomies of scale in production, frequently leading to import dependence (e.g. dependence on imported food in Cape Verde and Comoros); and,
- Increasing population pressure (such as in Comoros and Majuro Atoll in the Marshall Islands).

example

Example Box 2.1: Economic issues in small island states

The UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and the Small Island Developing States (UN-OHRLLS) has produced a listing of small island states and describes the main social and economic concerns in each. This can be found at: **http://www.un.org/special-rep/ohrlls/sid/list.htm**

The United Nations Conference on Trade and Development identifies four types of small island economies according to the way in which they manage these limitations. The four types reflect the main source of income on which the small islands rely:

1. Remittances from overseas, aid, and sales of fishing licences (e.g. Tuvalu, New Caledonia, Niue, Haiti);
2. Export of natural resources – non-renewable (e.g. bauxite/alumina from Jamaica; oil, copper, and gold from Papua New Guinea; and oil from Trinidad and Tobago) and renewable (e.g. squash, coconuts, bananas, and vanilla beans from Tonga; canned tuna from American Samoa);
3. Export of services such as tourism or offshore finance (e.g. Cayman Islands, Turks and Caicos Islands, Cook Islands);
4. Domestic manufacturing (e.g. textiles from Mauritius).

Many small island states depend on several of these income streams (see Example Box 2.2).

example

Example Box 2.2 Economic diversification options

Anguilla is a UK Overseas Territory that has few natural resources. Incomes are generated through luxury tourism, offshore banking, lobster fishing and remittances from Anguillans overseas. Growth in the tourism industry has led to growth of the construction sector, which has further bolstered economic growth.

Fiji has a variety of natural resources which it exploits: forests, minerals, fertile soils and fish, although the economy is driven by the two largest exports: sugar and tourism. There is a small but buoyant textile industry, and some new natural resource exports, such as the pepper root 'kava' which is being marketed as a homeopathic remedy for anxiety. The potential remains to further develop the mining industry to export copper as well as gold.

Montserrat has suffered from severe volcanic activity since 1995. This led to airport closure for several years and drove about two thirds of the population to leave the island. Agricultural output was affected as there is now a lack of suitable land for farming and crops were destroyed. Overseas aid and remittances from overseas are likely to be the main income source in the short term.

Samoa is a largely agricultural economy – employing two thirds of the labour force. About 90% of exports are generated from the production of coconut cream, coconut oil and copra. Development aid, remittances from overseas, and small-scale agriculture and fishing supplement this income. Tourism is starting to be developed.

Tonga depends primarily on aid and overseas remittances. However tourism and the export of agricultural products (notably, squash, coconuts, bananas and vanilla beans) are also important.

Tristan da Cunha with its population of 300 is financially self-supporting with income derived from fishing and the sale of postage stamps.

Photo: Dreamstime.com

Many small islands have been creative in their development strategies, relying on not just one, but numerous income streams. Tourism has been used as a driver of growth in several countries and established tourism industries exist in the Bahamas, French Polynesia, Jamaica, Netherlands Antilles, Maldives, British Virgin Islands, and the Seychelles.

Unfortunately, in the scramble for immediate short-term employment gains and income improvements from tourism, the concept of longer-term sustainability of the tourism industry is often overlooked. Economic valuation tools can be useful in identifying the long term costs and benefits of changing land use to make way for tourism, in identifying the costs and benefits associated with increases in imports of goods for tourists, but also the significant export of services that tourism generates. Without such valuation tools, the negative social, cultural, economic, and environmental impacts of tourism can be overlooked, to the detriment of long-term development.

In this context of finding sustainable development paths, new social challenges are arising on many small islands, see Example Box 2.3. Economic valuation offers one means of assessing the total short-term and long-term implications of dealing with these issues.

example

Example Box 2.3 Issues of concern in small islands

In 2002, the Small Islands Voice (SIV) surveyed people (through opinion surveys, town hall-type meetings, workshops, radio call-in shows, national and regional consultations, and other means) in 12 small islands to identify the main issues of concern. Topics raised include:

- Road development in Palau
- Tourism development in the Seychelles
- Beach access in Tobago
- Foreign investment in the Cook Islands
- Crime and violence in the Caribbean
- Water export in St. Vincent and the Grenadines
- Airport development in the Cook Islands
- Foreign fishing around Ascension Island
- Solid waste disposal in San Andres Island
- Climate change in Tuvalu

2.5 Decision making in small islands

Given the range of specific economic and environmental challenges faced in small islands, governance mechanisms have to be found to allocate resources effectively. The very nature of small islands, including their small size, means that decision making processes are shaped by several unique features: political realities; communal land ownership; sister islands; and available capacity.

Political realities

The political reality of decision making in small islands is very different to the politics of larger states due to the relatively powerful influence of very local issues and, at the other end of the spectrum, the intrusion of very global issues. On the positive side, the high level of interaction between politicians and constituents means that there is often a greater level of awareness at the political level about the issues of concern at the local level. Problems with transport systems, infrastructure, education or health systems are likely to be experienced by everyone, including the most senior decision makers. This ensures that topical issues rapidly gain a central position in the political arena. On the negative side, there is the potential for cronyism and nepotism, plus interference in the decision making process through personal differences and limited dialogue. This is not a unique characteristic in small islands, however it is significantly more visible than in larger countries.

External political and economic factors can profoundly stress small islands. For example, the islanders from the Chagos Archipelago were forced to leave their islands in the 1960s and 1970s as the United Kingdom and the United States governments evicted them in order to develop a military base. Other small islands in the Pacific have been significantly affected by World War II (e.g. the Republic of the Marshall Islands) and exploitation by traders (e.g Nauru, Barbados, and Banaba in Kiribati).

Communal land ownership

Land is incredibly important in most small islands. A lack of access to land resources that can be exploited profitably means the difference between subsistence living or profitable living. Several islands, over the years, have developed systems of communal land ownership that have been designed to ensure that all islanders have access to land. These land ownership systems, like any other, bring both positive and negative consequences. On the positive side, many islanders are born with the knowledge that they have access to land and land tenure rights. For example, approximately 86% of land in Fiji is owned by indigenous people through their clans (matagali). Traditional management approaches such as taboos and locally enforced fishing restrictions are still observed locally in other countries, for example, Niue, parts of Samoa, and Tonga, or are being revived (as in the Cook islands, Vanuatu). Yet in other cases, traditional management practices have deteriorated, or the obligations associated with them are not met. Consequently several have been supplanted by westernised systems.

The negative side of communal land ownership is that new arrivals to the islands and old migrants, who historically have no land rights, find themselves and their children marginalised and often existing with few entitlements. There is also an increasing number of people who are dispossessed without land, for instance where outer islanders move to their capitals in search of work. In small islands where rights to land are so critical to survival, resolving complex land disputes is an important part of a decision maker's challenge.

Kava drinking in Fiji is practiced at communal events. Photo: Ross Tompson

Sister islands

Many small island nations are not solitary islands, like Montserrat, Nauru and Reunion, but comprise a dispersed set of islands. There are small island sisters, such as Trinidad and Tobago; small islands with a handful of sisters such as American Samoa, Andaman and Nicobar, and Cayman Islands; small islands with 10s of sister islands (such as Cook Islands, British Indian Ocean Territory, Vanuatu); and islands with 100s of sisters (such as the Federated States of Micronesia and French Polynesia). Managing multiple island nations brings a whole set of additional challenges. Not only do sister islands have very different natural resource bases (for example Trinidad and Tobago), different development needs due to their proximity to the centre (such as the islands of Vanuatu), but the islands are often separated by significant distance, such as Kiribati, and St. Helena and the Dependencies. Administrations may also differ within countries, as is the experience of Rotuma in Northern Fiji. Decisions have to be taken about where to allocate limited financial resources, and inevitably (as in many larger countries) the majority of resources are focused on the central administrative area, with the periphery receiving significantly less.

Capacity available

Despite these challenges, some small island nations have proven over the centuries that they are extremely resilient to external shocks, such as the Cayman Islands recovery from the 1932 November “storm” that caused significant suffering and loss of life; and the reconstruction of East Timor after much of it was destroyed by Indonesian troops in the late 1990s. Ecosystems battered by tropical cyclones recover and regenerate annually.

Examples exist in small islands of both successes and failures of social transformation. For example, over the past decades, several small island nations have moved from being poor developing countries, to middle income, and in some cases, wealthy nations, such as the Bahamas, the British Virgin Islands, Antigua and Barbuda, the Netherlands Antilles, Trinidad and Tobago. Examples can be found of small islands that have moved from small fishing communities into international centres of commerce (such as British Virgin Islands, Cayman Islands and Turks and Caicos Islands); from subsistence farmers into mineral exporting nations (the Kingdom of Bahrain, Papua New Guinea and Trinidad and Tobago); from niche exporters of agricultural crops into international tourism destinations (such as Grenada, Jamaica, and Zanzibar). Other communities have not transformed themselves so smoothly, as the experiences in Niue and Nauru reveal, suggesting that there is not a universal resilience in small islands.

Despite the shortage of people within the labour force, those that participate often have a wide range of skills as they have to undertake several roles in their employment. While this gives individuals a breadth of knowledge that would be rare in larger countries, it also prevents individuals from gaining a more in-depth detailed knowledge of specific subject areas that comes from exposure over a long period. As a result, capacity to conduct complex impact or policy analysis is often limited. It is therefore necessary to develop guidelines, such as this toolkit, that recognise both the inherent skills available, but also this limitation.

Stakeholders

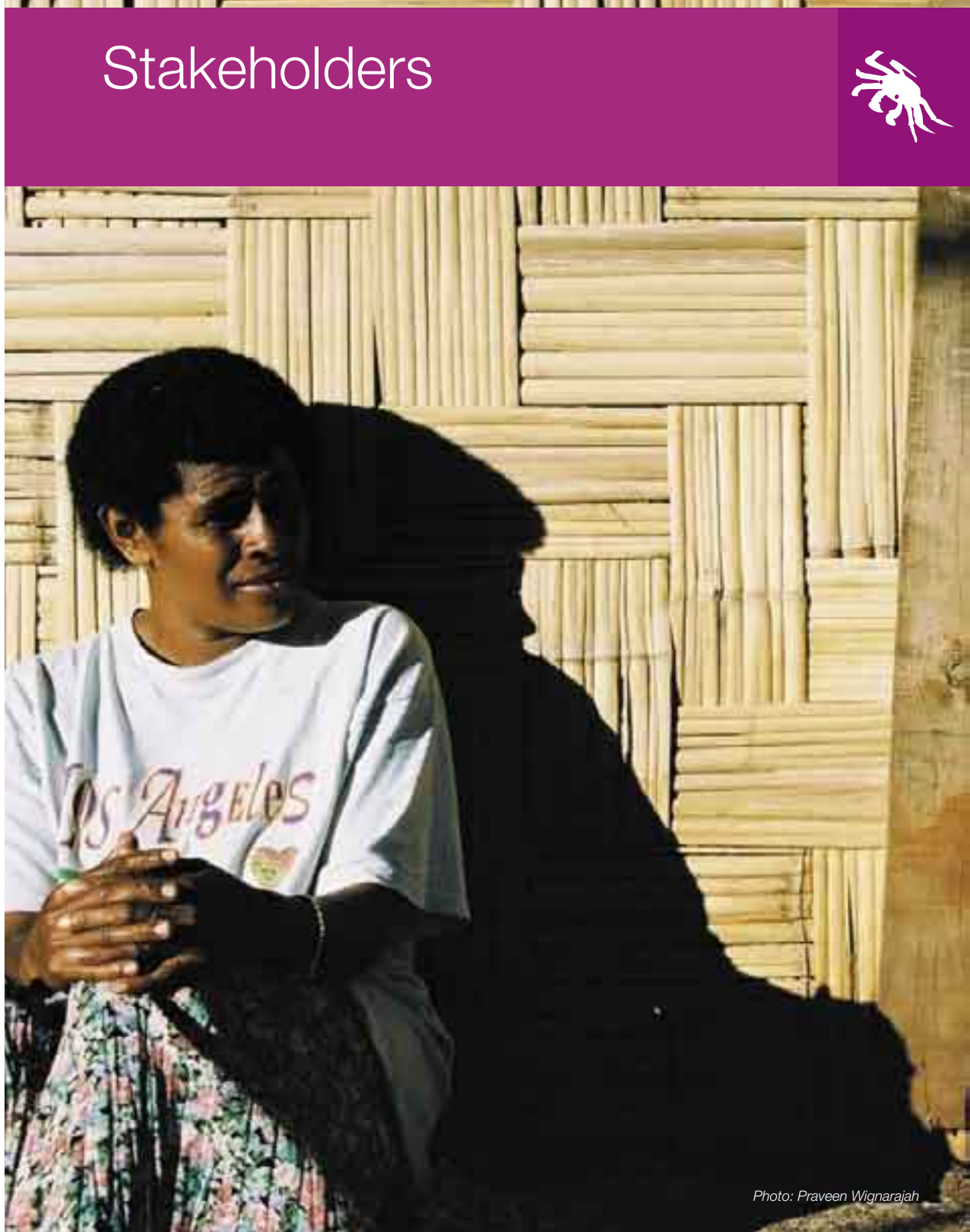
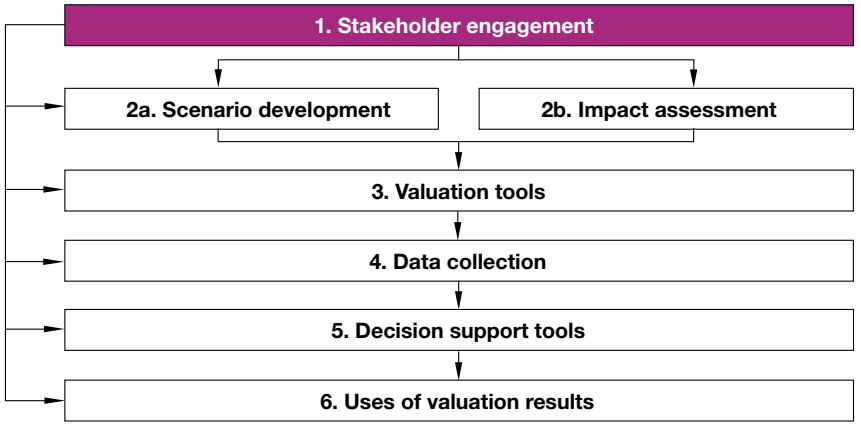


Photo: Praveen Wignarajah

3 Stakeholders

What you will learn in this section:

- The importance of stakeholder participation in economic valuation
- Which stakeholders to include in the decision process
- How to categorise stakeholders
- When to include stakeholders
- How to include stakeholders



3.1 Introduction

Best practice in economic valuation encourages the identification and engagement of stakeholders early in the process. This section will help you consider who is a stakeholder, why they should be included, who should be involved and when.

3.2 Participation in decision making

Undertaking projects that significantly affect the environment in which people live and work can create conflicts. One of the best ways to avoid conflict is to gain the support and trust of the affected groups. Discussions should be held with stakeholders about the project to ensure that the affected people:

- Have had some say in some aspects of the decision;
- Have the opportunity to voice their concerns;
- Feel that their concerns have been listened to;
- Have some sense of control over how the decision will affect them;
- Can ensure information on environmental values and uses is correct;
- Agree on and own the analysis.

Full participation by all people affected by a decision is often not possible. Therefore, at the beginning of the planning process, the level of stakeholder engagement needs to be considered carefully. Some countries have top-down decision making processes that do not require stakeholder participation, whereas others are more open to bottom-up decision making. If stakeholders are to be actively engaged there are several different methods by which to do this, see Table 3.1.

Where environmental goods and services are going to be affected by a new project or policy, there will be some stakeholders in favour of and some against the project. If the government needs to engage the group who are against the project or policy, then it is especially important to encourage involvement of stakeholder groups.

Table 3.1 Different types of participation in decision making

Forms of participation	Characteristics of each type of participation
Information giving	People participate by answering questions posed by project management using surveys. Information is then fed back to the various groups.
Consultation	Stakeholders are consulted and external agents listen to the views expressed. Solutions may be modified in light of stakeholders' responses.
Functional participation	Stakeholder groups are created to meet pre-determined objectives related to the project. This tends to happen after major decisions have been made.
Interactive participation	People participate in the decision making process, and the development and analysis of different options. Stakeholders and decision makers learn together.
Active participation	People participate by taking initiatives independent of external institutions to change systems.

There are two main benefits from early engagement:

- Reduction of potential short term conflicts among winners and losers;
- Reduction of long term compliance costs.

Already there are many countries that have adopted a participatory approach to environmental management, see Box 3.1.

example

Example Box 3.1 Stakeholder engagement in fisheries management in St Lucia

CANARI, the Caribbean Natural Resources Institute, played a central role in the evolution of the Soufriere Marine Management Area (SMMA), established in St Lucia in 1994. This followed an 18-month long process of participatory planning which brought together diverse stakeholders who had been in conflict over use of the coastal resources. After extensive engagement, the stakeholders agreed on the formation of the SMMA comprising 11 km of coast, including marine reserves, fishing priority areas, multiple use areas, recreational areas and yacht moorings. For more information see CANARI Technical Report No. 285, by Yves Renard, "Case of the Soufriere Marine Management Area (SMMA), St. Lucia"

Source: **http://www.canari.org/285smma.pdf**

3.3 Who should be involved?

Stakeholder analysis is the name for the process of collecting information about people who are affected by decisions, categorising them into groups, exploring the conflicts between them and finding where trade-offs exist. Stakeholders can be groups or individuals, and they can be described by socio-economic classifications such as income level, occupational group and employment status. Identifying stakeholders marks the beginning of the stakeholder analysis process. One method for identifying stakeholders is to think through:

- Who owns the land/resources?
- Who currently uses this area (for business/residence etc…)?
- Who plans to develop in this area?
- Who uses the area legally and illegally for any access or extractive purposes?
- Who uses the site at different times of day and different times of the year?

Stakeholders should then be grouped by their interests in and their use of the resource, e.g. on-site users, off-site, in the region, in the country and globally.

3.4 Categorising stakeholders into priority groups

Having identified the stakeholders it is then necessary to categorise them to determine whether they are a priority group to be engaged, and when and how to engage them. It is useful to think of stakeholders according to two criteria:

- Who will be affected positively or negatively by the decision;
- Who has the power to influence the decision and who has no power.

Prioritisation of stakeholders should then be made according to which stakeholders have influence and which stakeholders are impacted, see Figure 3.1. The three main stakeholder groups are: primary stakeholders, secondary stakeholders and external stakeholders.

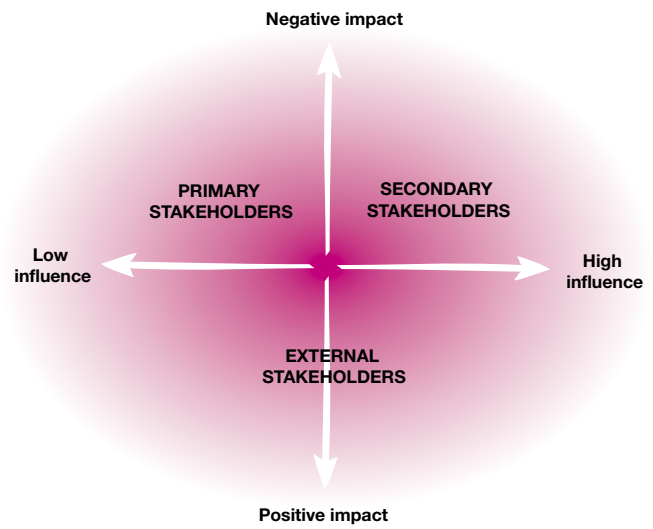


Figure 3.1 Prioritising stakeholders according to influence and degree of impact

Primary stakeholders experience the impacts of the project most severely either on their livelihoods or well-being. They often have little power to influence the outcome of the decision making process. This group is likely to include on-site resource users or residents, such as local businesses and local community groups. It is often the case that the primary stakeholders are not in a clearly defined group; they may be poor, landless or itinerant.

Secondary stakeholders are the people with the power to make the decisions and to shape the outcome, but they are unlikely to be directly impacted by the decision. This group tends to comprise government departments and ministries.

External stakeholders are those who are not impacted significantly by the project, but whose interests are affected. These people may be influential and have the power to influence the outcome and may include land developers, multinationals investing in the area, environmental NGOs or charities, trade groups and lobbying organizations.

Tug of war, Yadua, Fiji. Photo: Praveen Wignarajah

3.5 When should different stakeholders be involved?

Without support for a project there is less likelihood that it will be effective. Gaining that support takes careful consideration of when to engage each group.

Primary stakeholders: Primary stakeholders are at the heart of any decision, and hence they need to be reached as soon as possible and encouraged to participate. If possible they should be brought together to create an active steering or consultative group. Once functioning as a steering group or consultative group, the primary stakeholders themselves should decide who can be invited to join their group.

Secondary stakeholders: The managers of the resource and decision makers who can influence the final decision should be included throughout the process. Bringing all decision makers on board at an early stage ensures that they understand how the results are generated and what they mean. Secondary stakeholders should not be allowed to dominate