



I need to make a choice between potential management actions

Managers are sometimes faced with choosing between alternative management actions. For example, selecting between alternative sites for restoration or between alternative conservation strategies.

In this factsheet we discuss how to apply economic approaches (cost-benefit analysis and multi criteria analysis) to inform this type of decision in conjunction with total economic value framework. We focus on simple cases where managers are selecting between a limited set (e.g., 3) of management actions and have a limited budget.

What is Cost-Benefit Analysis?

Making decisions between alternative management actions requires predicting how each action affects the value people derive from the marine estate (Figure 1). Some of the effects will be benefits (e.g., increased catch rates), whilst others will be costs (e.g., reduced access). Cost-Benefit Analysis (CBA) involves measuring all of the costs and benefits, expressing them in monetary terms, and determining the alternatives with the largest net benefit (i.e., benefits minus costs). CBA is well suited to simple decisions between limited sets of alternatives where there are clearly defined benefits and costs that can be reliably measured.

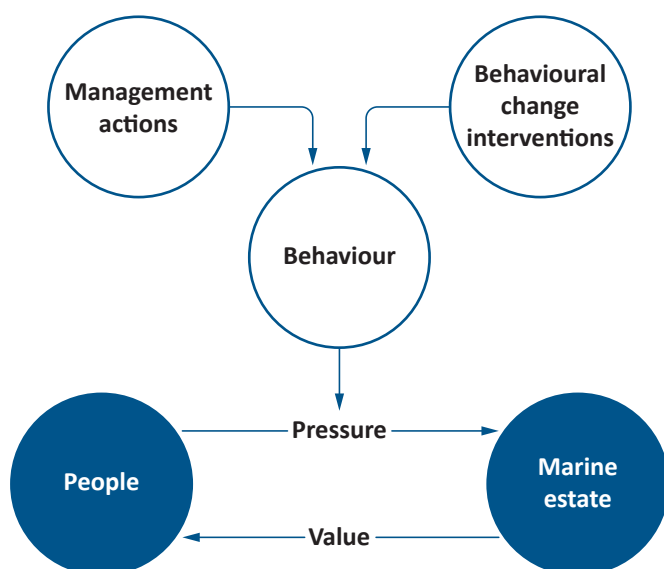


Figure 1: The marine management system.



Lobster pots in Tasmania. Image: Bruce Miller



Aerial image of the Great Barrier Reef. Image: (c) Matt Curnock

The Total Economic Value framework

The Total Economic Value framework (TEV) is often used to assist with implementing a cost-benefit analysis (Figure 2). It provides cues for the types of benefits and costs we might expect, ensuring a comprehensive discussion. This includes use values derived from interacting with an area and non-use values derived from knowledge of the continued existence of a marine area

in a particular state. Implementing CBA means predicting how management actions will affect the various aspects of total economic value (in monetary terms) and comparing the benefits and the costs. An alternative to using the TEV framework as a tool for organising all the benefits that may flow from the environment is to consider the flow of ecosystem services (provisioning, regulating, cultural) and determine the use and non-use values of each of these.

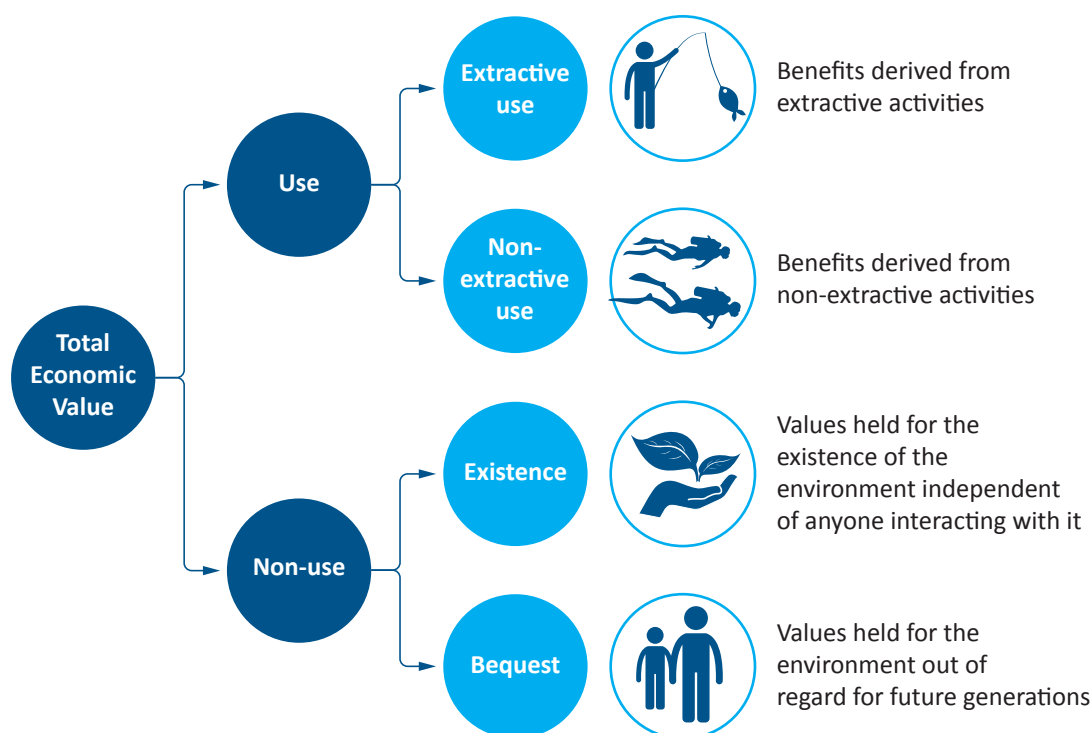


Figure 2: The Total Economic Value (TEV) framework.

Data

Cost-benefit analysis is a forward-looking exercise. It requires predictions of how management actions impact the various aspects of TEV expressed in monetary terms. Some of these impacts can be measured in markets (e.g., impacts of restrictions on commercial fishers) whilst others can be quantified using non-market valuation techniques.

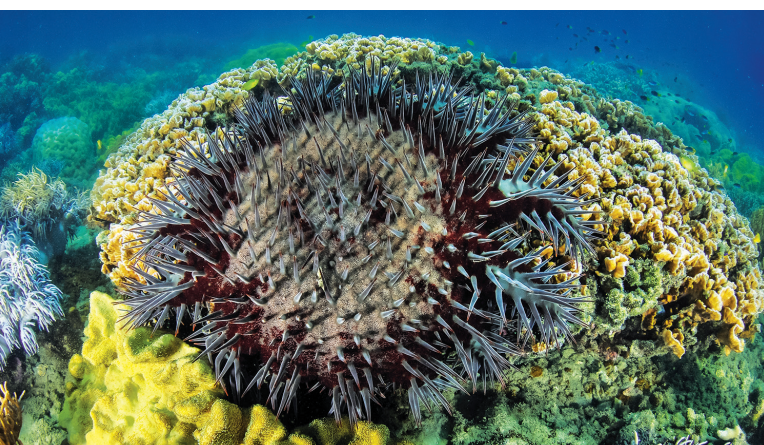
For more information see Factsheet: Frameworks and data to account for Environmental and socioeconomic assets and settings [hyperlink to come]

CASE STUDY 1

Examples where the TEV and Ecosystem Services frameworks have been used to organise information relating to the flow of benefits received from the environment: Assessing the economic, social, icon and brand value of the Great Barrier Reef

This study used a total economic value approach to estimating the value of the Reef, including option and non-use values in addition to the use values. The analysis sought to answer the question of what is the economic value of the reef in an intact state. Implicit to this analysis is the decision-making action that an agency would be faced with – is the Reef more valuable in an intact state and the action is to largely protect it from extractive or ‘use’ values; or are the use values greater and thus the action is to allow continued extraction (and ongoing degradation).

See Deloitte Access Economics (2017) for more information.



Crown of thorns starfish. Image: (c) Matt Curnock

Multi criteria decision frameworks – an alternative

Multi-criteria decision frameworks are a potential alternative to CBA suited to situations where benefits and costs are complex and interrelated or uncertain. They involve getting individuals (decision makers, the public or some other group) to rank outcomes in terms of importance, and using these ranks to score alternative management options based on predicted outcomes. This exercise can inform the decision process directly, but also helps highlight conflicting viewpoints in terms of trade-offs.

CASE STUDY 2

Assessing changes to ecosystem service values at large geographic scale: A case study for Australia’s Great Barrier Reef

This study adopts an ecosystem services approach to assess the value of interventions designed to protect the ecosystem services of the Reef, seeking to understand the potential value of benefits arising from preventing damage to the Reef from climate change and Crown of Thorns starfish. The analysis sought to answer the question ‘what is the value of protecting the Reef from these threats?’.

See Stoeckl, Condie & Anthony (2021) for more information.

REFERENCES

Deloitte Access Economics (2018). At what price? The economic, social and icon value of the Great Barrier Reef. Deloitte Access Economics.

Stoeckl N., Condie S. and Anthony K. (2021). Assessing changes to ecosystem service values at large geographic scale: A case study for Australia’s Great Barrier Reef, Ecosystem Services 51, 101352.

Meet your knowledge holders

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