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The use of ecosystem services valuation in Australian coastal zone management

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ABSTRACT

The use and influence of ecosystem services valuation in management decision-making, particularly as it relates to coastal zone management, remains largely unexplored in the academic literature. A recent Australia-wide survey of decision-makers involved in coastal zone management examined if, how and to what extent economic valuation of coastal and marine ecosystem services is used in, and influences, decision-making in Australia. The survey also identified a set of cases where economic valuation of ecosystem services was used for decision-making, and reasons why economic values may or may not be considered in the decision-making process. This paper details the method and results from this survey. Overall, there is strong empirical evidence that economic valuation of ecosystem services is used, but with important variation across coastal and marine management contexts. However, the impact of ecosystem services valuation on policy appears to be globally weak.

1. Introduction

Economic valuation methods applied to ecosystem services are now well established in many areas of application. The increasing development of the Ecosystem Services economic Valuation (ESV) approach has been fueled by the growing need to deal with ecosystem degradation globally, and valuation studies have increasingly been advocated to support decision-making and management. Coastal and marine ecosystems (CME) are some of the most heavily exploited ecosystems globally, with intense and increasing degradation. This situation requires urgent and effective management action, and has prompted increasing calls for more coastal and marine ESV to guide policy [24,4,31,6,28].

Despite this growing interest and the efforts to facilitate the inclusion of ESV in decision-making [34,3,10,26,9,28,14], there is still a paucity of academic literature examining the actual utilization of economic valuation by decision-makers [25,30]: what value estimates are actually used, how are they used (for what specific purpose, in which decision context and by whom) and to what extent are they used remain unanswered questions. In fact, it is uncommon to find a detailed explanation of the actual or potential use of the values that were estimated in valuation studies [25]. Usually methods are described, values are estimated, and presented as potentially useful, with little discussion of the actual decision-making contexts where these will/could be used, and with no indication of whether they are produced in response to a specific management support need. In short, the ultimate influence of ESV on policy, management, or investment remains largely unknown.

This issue, which is of particular concern in Australia where a substantial amount of ESV work has been conducted in the last decades (e.g. [5]), including in the coastal and marine domains (e.g. [33]), has recently been identified as an important research question (e.g. [30]).

This paper provides the first Australia-wide and expert-based review of the cases in which ESV has been used in support of coastal zone management. Information on which the review is based is derived from a survey of management stakeholders carried out with the broader aim of eliciting the perception of ESV's usefulness in the context of coastal zone management.

2. The survey

A nation-wide online survey was designed in order to represent the responses of the diversity of stakeholders involved in coastal zone management in different regional, State and Federal contexts of Australia, while minimizing the costs of the approach. A list of more than four hundred decision-makers involved in coastal zone

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management was developed. Decision-makers refer to individuals directly involved in the decision-making process regarding coastal and marine areas management in either an informative (collating information or delivering it to others), consultative (providing advice and recommendations to others), contributive (contributing to the final decision and/or management plan) or decisive way (deciding whether or not a decision is implemented). The list included:

- Members of governmental departments and associated agencies/bodies at both national and State levels;
- Members of regional and local governments and committees;
- Representatives of major marine industries or maritime activities (e.g. recreational or commercial fishing);
- Researchers (from different research organizations) who are part of coastal management committees or consultation processes[1].

The questionnaire included several sections, as well as a glossary for the specific terminology used. This paper focuses on the results of the section in which respondents document actual utilization of ESV in coastal zone management. Questions in this section focused on the extent to which respondents considered ESV during a decision-making process (often, rarely or never) in which they took part, for each of the different management contexts they were involved in. For each context for which respondents declared ESV was used, they were asked to differentiate between three types of utilization: ESV as a way to communicate, advocate and raise awareness; ESV for evaluation and decision-making (e.g. cost benefit analysis) and ESV as a basis for establishing taxes, subsidies, fees or damage compensation [25].

An additional set of questions focused on whether respondents knew of ESV studies for marine and coastal ecosystems that did have a significant impact on policy or management in a specific region, and about decision-making processes where ESV information existed but was not used. The reasons why it was not used were identified and respondents canvassed as to whether they thought that ESV should be used more in decision-making.

For each question, respondents were asked to provide at least one example with, if possible, a reference to a publication. This was crucial to collect concrete examples of what respondents had in mind when mentioning utilization of ESV. In addition, responses to this question were also intended to help compile a list of cases where ESV had been used, which, with the associated set of study references, is the focus of this paper.

The survey took place in October 2013, and was completed by 88 stakeholders. Characteristics of the respondents are summarized in Table 1.

The sample was highly diverse in terms of field of education, work experience and geographical location. In total 88 percent of respondents were currently working for government and associated agencies: 70 percent in policy and management and 18 percent in research. A further 17 percent were working for non-governmental research and higher education, and three percent of the sample identified themselves as industry representatives. Eight percent of the respondents declared being involved in other organizations, such as management committees; or working as private consultants. The work of respondents related to all jurisdictions (all States as well as the Federal level) and focused on a wide range of management contexts in total 58 percent of individuals declared working on marine areas and species conservation, 48 percent on coastal development, 39 percent on recreational activities and tourism, 25 percent on coastal and marine pollution, 24 percent on commercial fisheries and 14 percent on indigenous and customary use.

Table 1
Characteristics of survey respondents.

Characteristic	Survey response
Age (Average based on categories)	42 yo
Gender	
– Male	70%
– Female	30%
Level of education	
– Advanced Diploma and Diploma	9%
– Bachelor Degree	27%
– Graduate Diploma or Graduate Certificate	9%
– Postgraduate Degree	55%
Field of education (% of respondents indicating category)	
– Natural and physical science	33%
– Agriculture & environmental studies	36%
– Management and commerce	10%
– Society and culture	9%
– Engineering and technologies	6%
– Other	6%
Work experience (% of respondents indicating category)	
– Environmental management	92%
– Biological conservation	51%
– Economics	22%
– Business	20%
– Finance	7%
Geographic location	
– New South Wales	28%
– Victoria	8%
– Queensland	15%
– South Australia	13%
– Western Australia	16%
– Northern Territory	5%
– Tasmania	9%
– Australian Capital Territory	6%

Fig. 1 shows the distribution of respondents across management contexts for each of the eight jurisdictions. Respondents also varied in terms of years of experience in coastal zone management 26 percent stated between zero and five years of experience, 22 percent between six and 10 years, 24 percent between 11 and 20 years and 28 percent more than 20 years.

The respondents were asked to select at least one option that would best describe their role in decision-making among four possible roles. 60 percent declared having an informative role, 68 percent a consultative role, 66 percent a contributive role, and 33 percent a decisive role. The two latter categories of respondents (with a contributive and decisive role) could be considered to represent those who effectively "make decisions". 90% of these individuals were working for government and associated agencies, while 6% were involved in research activities (for government or non-governmental organization). 20% of them had a professional background in economics, 30% in business or finance, and 35% had more than 20 years of experience in decision-making.

3. ESV use in coastal management

Out of the 88 decision-makers who completed the survey, 52 declared having used ESV, while 30 declared being only familiar with it. Five declared having only heard about it.

[1] These individuals can be considered as decision-makers since they are directly involved in the decision-making process. In total 15 researchers answered the survey entirely, and five of them had an educational and/or professional background in social sciences, economics, business or management. Most of the individuals in this group did not appear to be involved in producing ESV, and all were potential ESV users.