

# Introduction\*

**Joseph C. Cooper, Federico Perali  
and Marcella Veronesi**

---

## MOTIVATION

The general objective of this book is to provide a reference work on making integrated environmental policy decisions in managing public goods and natural parks. A public resource such as a natural park has many different functions (for example, production of marketed goods, ecosystem protection, tourism), and its management requires a multidisciplinary approach covering various areas of expertise.

This book is the result of a multidisciplinary effort in which the economics discipline plays a central role. Nonetheless, the proper management of public resources requires the knowledge of the physical, biological and ecological characteristics of the functions supplied by the resource and the value of each function and of the public resource as a whole. The innovative approach proposed in the book consists in the integration of the assessment and management aspects of the policy decision process.

In order to define the most efficient managerial strategy to improve the environmental sustainability and quality of a public resource, information about the natural area and how it interacts with the economy is required. Further, a project representing a consensus over how the public resource is best managed is also sustainable if the project continues to be considered socially desirable by the future generations of tourists or residents.

Considering that conflicts of interests often arise among local actors that result in the perpetuation of the *status quo* rather than in the adoption of a Pareto improving management project, the manager of the natural area can reduce potential conflicts if he or she internalizes the users' preferences in the project proposal. In general, this modern attitude of institutional listening is effectively implemented if the 'voice' of the users is given the importance and attention it deserves within the decision process, thus putting into action the Latin motto 'vox populi, vox dei', i.e. a 'grass-roots' approach. After all, the best strategy for harmonizing the natural,

productive, protective and tourist functions of a natural area will not be implemented if it is not accepted by the local community, which is both the most frequent user and the main recipient of the legacy of the project for future generations.

## SPECIFIC OBJECTIVES

The empirical case study has been developed from survey information gathered by the Department of Economics of the University of Verona in Italy, on the west side of Garda Lake, in June–October 1997, within a research project financed by the Lombardy region. This survey was part of an integrated analysis on the multi-functionality of the West Garda Regional Forest in order to evaluate the best mix of forest functions and their hypothetical values, to assess the impact of possible policies on the local economy and to define cooperative policies between institutions, local operators and visitors. As this analysis was requested by the regional park authorities, it reflects a real-world application of research of interest to policymakers.

We adopt multi-criteria techniques, thereby permitting us to integrate bio-ecological, territorial and economic information in order to achieve the objective of best coordinating the natural, productive, protective and tourist functions of a public forest or park. Such an analysis can be used to define policies that allow for interactions among institutions, local economic agents and park users while accounting for implications of those policies on the local economy.

## METHODOLOGY

Our methodology integrates physical and social sciences in order to consider the forest system as a pool of different elements that interact among themselves and with external systems. In order to define the best combination of functions offered by the area, we use multi-criteria analysis techniques, which consider qualitative indexes of functions, integrating territorial information coming from a geographical information system (GIS) analysis with those related to the preferences of the park's users, estimated using the contingent (CVM) and travel cost (TCM) valuation methods.

The contingent valuation method is a direct (stated preference) method to estimate the value of environmental goods by using 'willingness-to-pay' questions that simulate market mechanisms. The travel cost

method is an indirect (revealed preference) method that estimates the value of the non-market good through the number of recreational trips and the travel cost for visiting the natural area. The number of trips to the area approximates the quantity consumed of the non-market good and the change in the welfare estimates the value of the good. Novel methodologies for CVM and TCM are developed and then used in the empirical case studies.

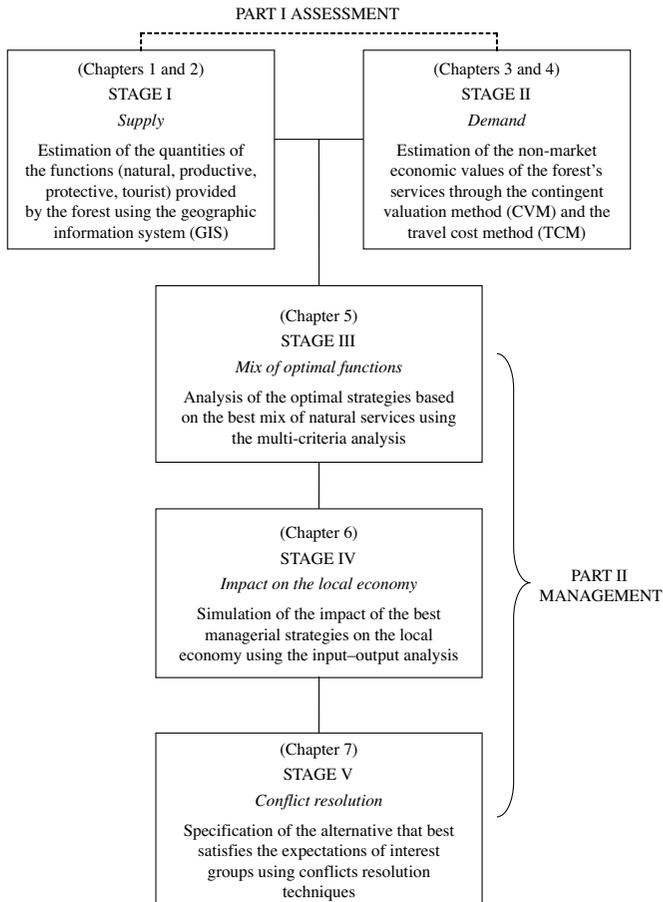
The results of the environmental valuation exercises and the GIS analysis are integrated into the multi-criteria analysis in order to help the public authority to make those management decisions that maximize a social and environmental goal specific to the natural area. In general, these management decisions have an impact on the local economy whose effects, when measured, may affect the social preference ordering suggested on the basis of the results obtained from the analysis, considering the natural park and its users as an isolated bio-economy.

We evaluate the effects of the decisions about the natural area as an isolated economy within the local economy as a whole as represented by a local social accounting matrix. Traditionally, the information about what is best for the natural area and the local economy is not sufficient for guaranteeing the implementation of the suggested plan because of conflicts of interests among either political parties or interest groups. We incorporate this important aspect of the local political economy by studying game theoretic techniques for conflict resolutions within the context of the natural area of the west side of the Garda Lake.

## ORGANIZATION OF THE BOOK

The book is organized as follows. The first two chapters estimate the quantities of the forest's non-market functions using GIS techniques. These chapters define the forest's supply of functions. In the third and fourth chapters we estimate the hypothetical prices of the forest's functions using CVM and TCM techniques. These chapters represent the consumers' demand for the forest's functions. In the fifth chapter we define the best mix of the forest's functions by using multi-criteria analysis, while in the sixth chapter we simulate the impact of each functional alternative on the local economy using a local social accounting matrix. Finally, Chapter 7 specifies the alternative levels of the functions that best satisfy the preferences of institutions, local economic agents and visitors to the forest, using techniques of conflict resolution. The book concludes with environmental policy recommendations. The Appendix describes the survey conducted on the west side of the Garda Lake. The organization

of the book is summarized in the five stages depicted in Figure 0.1. These stages are further grouped within the two assessment and management parts of the research.



*Figure 0.1 Book outline: analysis and chapter linkages*

## NOTE

- \* The views presented here are those of the authors, and do not necessarily represent the views or policies of the Economic Research Service or the United States Department of Agriculture.