

A theoretical framework for a ‘spatially conscious’ economic analysis of environmental issues

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Abstract

This paper proposes a theoretical framework for the integration of economic aspects and environmental aspects into the decision-making process for sustainable development strategies. The aim is integrate Geographic Information Systems (GIS) and environmental valuation methods in the structure of a cost–benefit analysis (CBA) in order to better evaluate spatial concerns. The conceptual approach is augmented by a modest case study of a marina development in Santa Rosalita on the Baja California peninsula in Mexico. This marina project is part of the proposed ‘Escalera Nautica’ an ambitious regional development scheme, which has caused controversy concerning its social, economic and environmental implications. The paper outlines the necessity to develop spatially conscious methodologies for a policy relevant research regarding sustainable regional development. Additionally, the paper contributes a spatial analytic perspective based on normative economic principles to the recent discussion on environmental economic geography.

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“Environmental economists usually pay little attention to inherently spatial aspects of much of their work”. (Brainard et al., 1999, p. 227)

1. Introduction

1.1. Economic geography and the environment

Environmental economic geography as a subfield of economic geography has recently been a point of discussion with respect to its current status and its future promise. In this discussion it is lamented that economic geography – in spite of geography’s inherently interdisciplinary focus and long research tradition of human–environment–relations – has until recently largely ignored the environment beyond its treatment as a more or less passive location

condition or resource factor input (Angel, 2000; Braun, 2002; Hayter, 2004; Soye, 2002a,b; Soye and Schulz, 2002; Wallace, 2002). The situation is troubling, especially given the continuing debate on environmental sustainability. Related disciplines (e.g. economics, sociology) have addressed questions that deal with the consequences of economic activities and other environmental issues but such research has been surprisingly rare in economic geography (Gibbs, 2006; Angel, 2000; Bridge, 2002; Gibbs and Healy, 1997). The exception is research directly related to agriculture and/or forestry and land use change which is clearly rooted in economic geography (e.g., Munroe and York, 2003; Bastian et al., 2002).¹

Most of the discussion regarding the contribution economic geography as a sub-discipline can or should make to environmental issues has focused on the sub-discipline’s lack of a coherent focus. Economic geography, it is argued,

¹ See also Page (2000) who discusses the gap between agricultural and economic geography.

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has not developed a systematic theory to deal with the conflicts between the economy and the environment; geography's fragmentation between 'physical geography' and 'human geography' is cited as one of the underlying factors for this lacuna (Soyez, 2002a,b). However, dealing with environmental issues in economic geography provides an important opportunity to bridge the gap between human and physical geography (Braun, 2002). On that basis, there has been a recent push to strengthen the role of economic geography as a research discipline in dealing with environmental issues and a number of researchers have started to increasingly engage with this topic.²

It is noteworthy that in the recent discussion regarding an environmental economic geography the relevance of spatial analytic approaches or the value of relevant research based on normative economic principles is seldom discussed. However a number of geographers (e.g., Hanink, 1995b; Hanon, 1994; Perrings and Hannon, 2001; Munroe and York, 2003) have engaged in this type of work and it is the author's opinion that there is much to learn from this.

One of the concerns addressed in the research presented here is the integration of economic aspects and environmental aspects into the decision-making process for sustainable development strategies. Whereas human-economic behavior is easily measurable in monetary terms, capitalizing the 'value of nature' poses persisting challenges. Even though there are valid and important criticisms regarding the valuation of nature in monetary terms³, it is the author's belief that:

(a) Monetary values are still the only common denominator among stakeholders in any environmental or land use debate (b) that because of this decision makers still rely heavily on CBA methodologies and (c) concurring with Hanink (1995a, p. 373), "spatial analysis in general and spatial-economic analysis in particular, can help rather than hinder, progress towards solutions of environmental problems" – especially, if further research regarding the improvement of normative methods concerning the valuation of nature is undertaken.

The contribution of this paper lies in the fact that the research presented here provides a spatial analytic perspective based on normative economic principles 'a perspective that is clearly underrepresented in the recently emerging discussion about an 'environmental economic geography'. The largely conceptual research offered here, extends Hanink's (1995a) approach by providing a theoretical discussion on how it can be embedded into policy relevant applied geography and therefore answers to the call for such research (Braun, 2002; Angel, 2000). In the context of policy relevancy this research presents a markedly different perspective (spatial analytic) than related research on

policy and scale addressed by Jonas and Gibbs (2003) and others (Bridge and Jonas, 2002; Gibbs et al., 2002; Heynen, 2003; Jonas and Bridge, 2003; Swyngedow, 2004; Swyngedow and Heynen, 2003), which is grounded primarily in political economy.

The research presented here has two goals: a general and a more specific one. Relevant to the previous discussion the first and more general aim is to contribute to the literature on environmental economic geography by providing an interdisciplinary research perspective that links the field of environmental economics with the fields of economic geography. The focus here is to demonstrate that research based on normative economic principles can and should play a significant role as part of a coherent environmental economic geography.

The second and more specific aim is to outline the need for 'spatially sensitive' – taking into consideration the concepts of scale and proximity – valuation methods of nature in a regional development context. This paper outlines some theoretical ideas on how GIS technologies can be used to improve land management decisions in a cost-benefit analysis (CBA)⁴ context.

The failed Santa Rosaliita marina development – a part of the Escalera Nautica project in coastal Baja California and the Sea of Cortez areas in Mexico – is used to illustrate the conceptual framework in a real world context. The case study also provides a starting point for a discussion of CBA as an integral part of integrated coastal zone management (ICZM)⁵ – a strategy for managing coastal development widely favored by policy makers (Turner, 2000). The research related to the Santa Rosaliita marina development is not intended to be an empirical investigation but rather aims to provide a real life framework for the discussion of the problem at hand and illustrates the need to develop better valuation and analysis methodologies in a CBA context. Though most of the information on the case study is based on secondary sources, using the Santa Rosaliita marina development as a relevant example aids in the shaping of the overall discussion; and reduces the level of abstraction.

The remainder of this paper is divided into three parts. The first part provides a brief discussion about valuing nature from an environmental economics perspective and outlines the spatial shortcomings related to this perspective. The next part of the paper offers some thoughts on how GIS technology can be used to improve 'spatial sensitivity' in a CBA framework. The paper concludes with a few thoughts regarding the applicability of the discussed concepts into an integrated coastal zone management (ICZM) strategy in the context of the case study.

² Evidence for this are two recent conferences/workshops on Environmental Economic Geography hosted by the University of Cologne, Germany in 2001 and 2004.

³ For a critique of this see Harvey (1996).

⁴ Refer to Boardman et al. (2001) for practices regarding CBA methodologies.

⁵ See: Post and Lundin (1996) for "Guidelines for Integrated Coastal Zone Management".

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