



Analysis

Integrating Cultural Ecosystem Services in an Ecosystem Satellite Account: A Case Study in the Gulf of Saint-Malo (France)



Jean-Christophe Martin ^{a,*}, Rémi Mongruel ^b, Harold Levrel ^c

^a Vertigo Lab, 87 quai des queyries, 33100 Bordeaux, France

^b UMR M101 AMURE, Marine Economics Unit, IFREMER Centre de Brest, CS10070 F-29280 Plouzané, France

^c AgroParisTech/CIRED, Campus du Jardin Tropical, 45 bis, avenue de la Belle Gabrielle, 94736 Nogent-sur-Marne Cedex, France

ARTICLE INFO

Article history:

Received 13 April 2016

Received in revised form 3 March 2017

Accepted 7 July 2017

Available online xxxx

Keywords:

Ecosystem satellite account
Household production function
Cultural ecosystem services
Recreational activities

ABSTRACT

This paper develops an accounting approach for estimating cultural ecosystem services. Ecosystem satellite accounts should be able to include cultural ecosystem services, which raise numerous assessment difficulties. A new assessment method is proposed, which uses the production for own use of households who carry out recreational activities depending on cultural ecosystem services. An application is carried out in the Gulf of Saint-Malo (France). A survey was implemented in order to collect the accounting data. Six recreational activities mixing the consumption of pure leisure (mainly sport) and marine cultural ecosystem services (mainly fishing and seascape watching) were considered: onshore fishing and shellfish gathering; hiking; recreational boating and offshore fishing; canoeing and kayaking; light sailing; scuba-diving and underwater fishing.

The results show that the household production value for these six marine and coastal recreational activities in the Gulf of Saint-Malo ranges between 210 M€ and 276 M€, contributing to 97% of the output of recreational services for these activities. It means that the current national accounting system captures only 3% of the output of marine recreational activities. About 82% of production means are devoted to the consumption cultural ecosystem services, while the remaining part of the production value is assigned to the consumption of sportive services. Hence, the production value associated to the main uses of marine cultural ecosystem services can be estimated at between 172 and 226 M€, with respective value-added of 110 M€ and 154 M€. These results definitively point out the necessity of distinguishing recreational services which depend only on human activities from cultural ecosystem services which depend on outputs from ecosystem processes, in order to avoid over-estimating or confusing estimates of marine cultural ecosystem services.

© 2017 Elsevier B.V. All rights reserved.

1. Introduction

Since the Millennium Assessment (MA) in 2003, there has been a growing interest in literature related to the issue of ecosystem services valuation (Fisher et al., 2009; Laurans et al., 2013). “The Economics of Ecosystem and Biodiversity” (TEEB) initiative defines ecosystem services as the “direct and indirect contributions of ecosystems to human well-being” and has adopted a general framework linking ecosystems with economics based on the famous figure denoting the “cascade” pathway from ecosystem structure and processes to human well-being (de Groot et al., 2010, after Haines-Young and Potschin, 2013 and Maltby, 2009). An ecosystem service is considered to be the result of ecological processes, providing well-being to people thanks to the different benefits generated from these ecosystem services. Under certain assumptions, these benefits can be valued in monetary units. Although

they only partially capture the importance of ecosystem services, monetary assessments are considered necessary for internalizing externalities in economic accounting procedures and in policies that affect ecosystems, thereby influencing decision-making at all levels (de Groot et al., 2010; Braat and de Groot, 2012). For the valuation of ecosystem services, welfare economics valuation methods are considered to be the most coherent with standard economic theory (Mäler et al., 2008). However, their implementation poses some serious problems, due in particular to the high level of uncertainty regarding the values of support services and cultural services (Ludwig, 2000; Toman, 1998), and the controversies around the stated preferences analysis for capturing indirect use, non-use, and non-market use values in general (Kahneman et al., 1990; Kahneman and Ritov, 1994; Horowitz and McConnell, 2002).

An alternative approach, the accounting approach, allows the limits specific to welfare economics methods for the valuation of many ecosystem services to be overcome. Following recommendations by Agenda 21, adopted during the Rio Earth Summit in 1992, the statistical division of the United Nations attempted to construct an international

* Corresponding author.

E-mail addresses: jcmartin@vertigolab.eu (J.-C. Martin), Remi.Mongruel@ifremer.fr (R. Mongruel), harold.levrel@agroparistech.fr (H. Levrel).

accounting framework for the environment: the System of Environmental-Economic Accounting (SEEA), whose first version was published in 1993. Using concepts identical to those of the system of national accounts (SNA) (European Commission et al., 2009), the SEEA seeks to build a coherent assessment framework based on observed transactions (Bos, 1997). After several improvements, the SEEA Central-Framework now provides the inclusion of four kinds of accounts: physical stock and flow accounts, physical accounts (e.g.: physical input-output table), functional accounts (e.g.: environmental protection expenditure account), and asset accounts (United Nations et al., 2014b). In 2012, an experiment was carried out to include ecosystems in the list of natural assets: the SEEA Experimental Ecosystem Accounting (SEEA-EEA). The SEEA-EEA is developing an integrated accounting structure of ecosystem services and ecosystem conditions in both physical and monetary terms (United Nations et al., 2014a). In addition, it is recognized that spatial areas must form the basic focus for ecosystem measurement. Thus, the interest of this approach is its potential ability to explicitly address the interactions between ecosystems and human activities (Edens and Hein, 2013), which can be depicted and assessed at the scale of spatial units corresponding to well-identified terrestrial or marine ecosystems. This approach could serve as the basis for building ecosystem satellite accounts, especially for marine areas of high ecological importance, which would necessitate stronger management institutions.

One specific challenge in building an ecosystem satellite account remains the assessment of cultural ecosystem services. Indeed, the value of cultural ecosystem services cannot easily be captured by observed transactions. In addition, they include a wide range of services, some of them are social constructs showing little dependence on the state of the ecosystems (Daniel et al., 2012). According to the MA (2003), cultural services are the “nonmaterial benefits people obtain from ecosystems,” and include “cultural diversity, spiritual and religious values, knowledge systems, educational values, inspiration, aesthetic values, social relations, sense of place, cultural heritage values, and recreation and ecotourism”. From an ecosystem services accounting perspective, only recreational activities could reasonably expect to be included within a quantitative assessment. In an attempt to provide a more comprehensive and rigorous definition of cultural ecosystem services, the Common International Classification of Ecosystem Services, developed by the European Environment Agency, distinguishes four types of cultural ecosystem services: physical and experiential interactions, intellectual and representative interactions, spiritual and/or emblematic values, and other cultural outputs (CICES, 2013). It is notable that this classification, which has been elaborated for accounting purposes as it is a contribution of the EEA to the revision of the SEEA, unfortunately avoids the use of the terms “recreation” or “recreational activities”.

The ongoing debate regarding the scope and definition of cultural ecosystem services demonstrates the need to clearly define the status of outdoor recreational activities when building an ecosystem service accounting framework. Boyd and Banzhaf (2007) point out that recreation should more appropriately be considered a benefit produced using both ecological services and conventional goods and services. In this paper, we adopt the proposal by Edens and Hein (2013) who define, for the purpose of ecosystem accounting, ecosystem services “as the contributions of ecosystems to productive activities or to consumptive activities” (p. 44). This definition is particularly well suited for the building of supply and use ecosystem satellite accounts, which would incorporate all human activities using ecosystem inputs (for productive activities) or services (for consumption activities). This paper aims at demonstrating that such a satellite ecosystem account based on supply and use tables could provide an accurate assessment of cultural ecosystem services, providing that relevant conventions are adopted for the inclusion of recreational activities.

Recreational services are mostly produced by households themselves for their own use. Up to now, the household production for services for own use is outside the scope of the SNA and thus excluded

from the national economic tables. Since 1980s, there have been attempts to value non-market household production for services for own use from an accounting perspective, by developing a household satellite account (Eurostat, 2003). However, housework production is included in, but not the production of, outdoor activities, such as recreational activities. This paper proposes a methodology for including in an ecosystem satellite account focused on the marine cultural ecosystem services, the production for own use of recreational activities by households. Recreational services generate a mix of benefits, some of which are not directly connected to ecosystems. In order to focus on services which depend on physical or experiential interactions with ecosystems (according to the CICES definition of cultural ecosystem services, CICES, 2013), this paper proposes a consumption time criterion in order to disentangle cultural ecosystem services from other benefits of outdoor activities, in particular pure leisure activities like sport. At last, the methodology is tested empirically on a marine ecosystem located in northwestern France, the Gulf of Saint-Malo. A supply and use table for the consumption of cultural ecosystem services is estimated for six recreational activities.

The article is structured as follows. The first section presents the accounting concepts and principles used to construct the ecosystem satellite account devoted to the recreational activities that enable households to consume cultural ecosystem services. The second section describes the implementation of the satellite ecosystem account for household marine recreational activities for own use carried out in the Gulf of Saint-Malo. The third section describes the main results. The conclusion addresses the strengths and limits of this approach which aims at providing a monetary assessment of household recreational activities consuming cultural ecosystem services.

2. Estimating Household Production for Own Use in the Case of Recreational Activities Using Cultural Ecosystem Services

2.1. Accounting Concepts for Defining Household Recreational Activities

This section defines the conventions and concepts mobilized in this paper to value household production for their own use in the context to the construction of an ecosystem satellite account. Two fundamental concepts must be mobilized in order to define recreational activities from an accounting perspective: the difference between an economic activity and a product, and the distinction between productive activities and consumptive activities.

Products are defined in the national accounts as the goods and services produced within an economy to be consumed by institutional units. They are the output of economic activities. On the other hand, economic activities are related to the production process, namely the combination of inputs (labour, capital, ecological inputs, and goods and services) implemented by institutional units in order to produce the products. For example, the number of fish landed is the product of the fishing activity, whereas the fishing activity is a combination of inputs (labour like the fishermen workforce, capital such as boats, provisioning ecosystem services corresponding to the delivery of consumable fishes by the sea, and goods and services like petrol and insurance). It is important to note that an economic activity can produce multiple products and a product can also be produced by multiple economic activities. Productive activities are related to the production process, whereas consumption activities are related to the consumption process of products (goods or services).

In relation to the issue of household activities, Eurostat (2003) defines household production as the combination of unpaid labour, capital, and intermediate goods and services used to produce goods and services. In the household satellite account, the time is the reference unit used to physically estimate the unpaid labour. This time is called the ‘production time’. The other components are quantified with monetary units. In order to have a homogeneous measure of household production the production time is translated into monetary units.

Download English Version:

<https://daneshyari.com/en/article/5048570>

Download Persian Version:

<https://daneshyari.com/article/5048570>

[Daneshyari.com](https://daneshyari.com)