

A social-ecological approach to voluntary environmental initiatives: the case of nature-based tourism

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Abstract This paper addresses the role of voluntary environmental initiatives by the tourism industry to alleviate social dilemmas for the management of natural resources. The objective is to explore whether previous findings on the determinants of voluntary action in the management of common-pool resources (CPR) also apply to a sector, such as tourism, where non-extractive uses are dominant. The paper applies the social-ecological systems framework recently developed by Ostrom (*Science*, 325, 419–422, 2009) to analyze qualitative data from meta-analyses of successful voluntary environmental initiatives in tourism. Results show that the determinants of voluntary action in tourism are partially consistent with previous research on CPR, finding relevant the presence of leadership, norms of behavior among members of the voluntary initiatives, shared mental modes, salience of the resource for users, and substantial productivity of the resource system in the likelihood of self-organization. However, other variables that have been shown to be relevant in non-tourism CPR situations are not supported by this analysis, such as: most variables regarding the ecological system (its size, predictability, and the mobility of its derived resource units) as well as the number of users and supportive collective choice rules that enable users to craft and enforce some of their own rules. The implications of this partial mismatch in findings are not straightforward. The paper presents a set of research questions that open a path for further research.

Keywords Social-ecological systems · Voluntary environmental initiatives · Tourism · Governance

Introduction

Voluntary environmental initiatives are increasingly considered among academics, governments, and business leaders as a relevant policy alternative (Dawson and Segerson 2008; Khanna 2001; Lyon and Maxwell 2002; Sasidharan et al. 2002). Hundreds of

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initiatives are currently implemented in the European Union and in the United States (Delmas and Keller 2005), and some examples can also be found in developing countries (Rivera 2002). This shift in the regulatory paradigm is fostered by the desire to help prevent the negative legal and political consequences associated with regulatory failure and to find cost-effective solutions to environmental problems (Khanna 2001).

To address the validity of a policy approach based on voluntary environmental initiatives, we need to better understand the mechanisms that underlie the emergence and stability of voluntary environmental initiatives under different contexts. Previous research has addressed the economic consequences for the business of adopting voluntary environmental initiatives (see reviews in Blanco et al. 2009a; Margolis and Walsh 2001) as well as its public policy implications (Darnall and Carmin 2005; Dawson and Segerson 2008; Delmas and Keller 2005; Mackendrick 2005; Rivera and De Leon 2005; Rivera et al. 2009). Also, scholarship on natural common-pool resources (CPR) has explored the conditions affecting the likelihood of users of CPR engaging in collective action to self-organize for a more sustainable use of their shared resources. This literature has shown that voluntary environmental initiatives are widespread, but that their emergence is not guaranteed. This finding has prompted a broad body of theoretical, empirical, and experimental literature that examines how different agents make use of CPR under different incentive structures (Agrawal 2001; Baland and Platteau 1996; Ostrom 1990; Ostrom et al. 1999; Wade 1988). Recently, this literature also considers the attributes of the ecological systems on which users depend, moving to a social-ecological systems (SES) approach (Ostrom 2007, 2009). Most of this literature on CPR focuses on social dilemmas in resources that suffer pressures from extractive uses, such as fisheries and forestry (see Basurto and Coleman 2010; Chhatre and Agrawal 2008; Nagendra 2007; Ostrom 1990; Wilson et al. 2007), or social dilemmas for the provision of infrastructures to facilitate their extraction, for example irrigation systems (see Meinzen-Dick 2007; Ostrom 1990; Wade 1988). Results show some common characteristics in cases where users have been able to develop strategies to sustain their natural resources over time (Agrawal 2001). The most salient regularities include the number of users, presence of leadership, existence of norms or other forms of social capital, supportive collective choice rules, a sound knowledge of the socio-ecological interactions or shared mental modes, salience of the resource to users, size of the resource system, its productivity, and the mobility of derived resource units (Ostrom 2009).

This paper extends this literature by focusing on the tourism uses of natural CPR, which mainly imply recreational uses. Natural CPR are inputs to the productive process of tourism firms but most importantly, the recreational (non-extractive) use of these natural resources is part of the product they sell. Despite the fact that there are some tourism destinations where the tourism product is separate from natural attractions, the quality of the experience at many others, particularly nature-based tourism destinations, is directly related to the quality of the environment (Huybers and Bennett 2002). These tourism-related uses of natural resources are increasingly relevant as a result of the growth of tourism across the globe (UNWTO 2009). Tourism is currently one of the major trade categories worldwide, generating US \$944 billion of receipts [30% of the world's exports of commercial services or 5% of worldwide gross domestic product (GDP)] and contributing to employment with an estimated 6–7% of the overall number of jobs (direct and indirect) (UNWTO 2009). Therefore, environmental policy alternatives for tourism uses should be thoroughly analyzed. Voluntary environmental initiatives in the tourism industry are a recent and expanding phenomenon (UNEP 1998; UNWTO 2002) that includes both certified (ecolabels) and uncertified practices (e.g., codes of good environmental conduct,

among others). Some well-known examples are the Blue Flag Program,¹ which has certified over 3,400 beaches and marinas in 41 countries across Europe, South Africa, Morocco, Tunisia, New Zealand, Brazil, Canada, and the Caribbean, and the International Tourism Partnership, with more than 11,100 hotel members all over the world.²

The objective of the present paper is to explore whether previous findings on the determinants of voluntary action in the management of CPR also apply to a sector, such as tourism, where non-extractive uses are dominant. The SES framework (Ostrom 2007, 2009) is used to systematically analyze potentially relevant variables influencing the development of voluntary environmental initiatives by tourism firms. One limitation of this paper compared with previous literature is that at this stage, no statistical analysis or modeling of the interrelation of the variables is presented. Instead, the paper builds on secondary analyses collected by the United Nations Environment Program (UNEP) (UNEP 1998) and the United Nations World Tourism Organization (UNWTO) (UNWTO 2002) on more than 100 successful voluntary environmental initiatives in tourism.

Results show that the determinants of voluntary action in tourism according to UNEP (1998) and the UNWTO (2002) are partially consistent with previous research on CPR: presence of leadership, norms of behavior among members of the voluntary initiatives, shared mental modes, salience of the resource for users, and substantial productivity of the resource system are all stylized facts of successful voluntary environmental initiatives in tourism. However, using the SES framework helps reveal that other variables regarding the ecologic system on which tourism firms depend (relevant in previous CPR research) as well as the number of users and presence of collective choice rules are not noted as differentiating factors of successful voluntary action in these two UN studies. Ecological variables include the predictability of the ecological system, the mobility of its derived resource units and its size. The size of the group of users is not identified either as a relevant characteristic in determining the success of voluntary initiatives in tourism. Finally, despite much effort devoted by the UNEP (1998) and the UNWTO (2002) to the governance system of voluntary initiatives, their findings on relevant attributes differentiating successful initiatives do not match previous research on CPR. Whereas research on CPR places higher importance to the existence of supportive collective choice rules, the focus of UNEP (1998) and the UNWTO (2002) is extensively in operational rules.

Whether the (partial) mismatch in findings in the tourism studies under consideration with previous findings for other CPR comes from its particular characteristics or from the UN studies in tourism obviating these factors is a topic for further research. Is it the case that voluntary environmental initiatives only take place in tourism destinations that rely on certain types of ecological systems? Or that only flourish in countries whose legal system enables tourism users of natural resources to develop their operational rules in a specific region? Answering these and other questions derived from the research presented in this paper will advance our understanding on why voluntary initiatives to preserve the environment are successfully developed in some destinations but not in others.

The rest of the paper is organized as follows: section [Extractive uses of natural CPR](#) shortly presents the SES framework (Ostrom 2007, 2009) and jointly with its main working components presents and describes the main findings of previous field research on the voluntary environmental management of CPR. Section [Recreational uses of natural CPR: Tourism](#) reviews the existing literature on CPR and voluntary environmental initiatives in tourism. This review shows that CPR situations have been described in the tourism

¹ <http://www.blueflag.org/>

² <http://www.tourismpartnership.org/Leadership/Leadership.html>

literature as social dilemmas and that there are monetary and non-monetary incentives for tourism firms to develop voluntary environmental initiatives. Later, the SES framework is used in this section to describe the main components of voluntary environmental initiatives by tourism firms as presented in the UNEP (1998) and the UNWTO (2002). Section [How does tourism differ with previous CPR findings on voluntary environmental action?](#) discusses the results from applying the SES framework to tourism uses and shows where tourism matches with previous CPR findings and how they differ, and Section [Conclusion](#) concludes.

Extractive uses of natural CPR

In recent years, there has been a move in the CPR literature from a focus on resource users and their interactions in a static resource system to a broader approach based on the analysis of SES. An ecological system is considered to be an SES when it is linked with, and affected by, at least one social system (Anderies et al. 2004). Initial work in this area was motivated by a desire to include in the analysis of cooperation in the social system the dynamics of ecological processes and rule change (Agrawal 2001; Anderies et al. 2004).

Recent work in this area has presented a specific framework for identifying combinations of variables that affect actors' incentives in using ecological systems under diverse governance systems (Ostrom 2007, 2009). Its objective is to help diagnose why some SES are sustainable whereas others collapse, by identifying and analyzing the relationships among multiple levels of these complex systems (Ostrom 2007). To do so, the framework can be applied to identify relevant variables in studying one specific SES or to organize studies of similar systems under a common set of variables (Ostrom 2009). This paper is based on the latter approach. Previous applications of the SES framework include examinations of human uses of ecological systems in irrigation (Meinzen-Dick 2007), forestry (Chhatre and Agrawal 2008; Nagendra 2007), fisheries (Wilson et al. 2007), and water pollution in lakes (Brock and Carpenter 2007).

The SES framework stresses a universality of working parts of SES. Its argument is that the diversity of regularized social behavior that we observe along multiple scales consists of several layers of universal components that create structures affecting the behavior of interdependent individuals, as well as the outcomes they receive. The SES framework examines the nested attributes of a resource system (RS, see Table 1) and the resource units (RU) generated by that system that jointly affect the incentives of users (U) within a set of rules crafted by governance systems (GS) affecting interactions (I) and outcomes (O) over time. These are all affected by social, economic, and political settings (S) and by the state of related ecosystems (ECO). These eight broad variables can be unpacked into a second-tier set of variables that have been found in empirical studies to impact diverse interactions and outcomes. The second-tier variables are considered the initial core conceptual variables necessary to identify the type of SES operating at a particular location, as well as the reasons for sustainable or unsustainable outcomes (Ostrom 2007). These second-tier variables include, among others, 30 variables identified by Agrawal (2001) as critical factors in the organization, adaptability and sustainability of common property.

Ten of these variables have frequently been identified by field researchers as affecting the likelihoods of users' engaging in self-organization (Ostrom 2009). Five of them refer to the characteristics of users of the resource; starting with Olson's seminal work (1965), a first variable is the size of the group of users. As opposed to earlier simpler views suggesting that the smaller the group, the more likely to engage in successful collective action, more recent

Table 1 Second-tier variables of successful voluntary initiatives in nature-based tourism destinations

Social, economic and political settings (S)	
S3—Political stability. S5—Variable and volatile demand; Tour operators as intermediaries; Strong market competition, Environmental awareness by consumers and suppliers.	
Resource system (RS)	Governance system (GS)
RS4—Tourism industry: accommodation, restaurants, sports and leisure, attractions, transport RS5—Feasible improvements to the resource, renewable resource, mature tourism destinations RS8—Perishable (no storage) RS9—Mainly in developed countries	GS1—Public–private initiatives, government funding GS2—NGOs organizing voluntary initiatives GS3—Private foundations funding GS5.a—Position rules: responsibilities of members, verification body, evaluation body, and monitor GS5.b—Boundary rules: public, clear and transparent rules on who can partner, stringent and proactive environmental requirements (substantially above regulation) to enter, realistic requirements to enter, affordable membership fees, existence of a time commitment, specific terms of use of a logo, easy initial steps GS5.c—Aggregation rules: update in requirements to enter GS5.d—Information rules: state of the voluntary initiative, communication channels among members, technical assistance, public, clear and transparent governance system GS5.e—Payoff rules: image and reputation, marketing, services, immediate services when becoming member, services from membership fees GS8—Diverse monitoring and sanctioning processes
Resource units (RU)	Users (U)
RU4—High economic value for tourism uses	U2—Voluntary initiatives addressing firms with a comparable tourism product; Heterogeneous firms. U3—Adequate use of prior experience U5—Leadership U6—Trust and respect; Sense of group membership U7—Common understanding in awareness; Acceptance of environmental issues, their capacity for action and knowledge of available voluntary programs U8—Salience of natural resources to users
Interactions (I)	Outcomes (O)
I1—Soft individual pressures and severe aggregate pressures. I2—Know-how sharing, confirmation of benefits obtained	O1—Awareness raising, acceptance of environmental issues, learning, cooperation, product improvement, higher economic performance, quality guarantee. Limited number of participants, higher levels of transparency, requirements and recognition for public–private initiatives O2—Significant improvements in resource conditions O3—Negative externalities to residents
Related ecosystems (ECO)	
ECO1—Strong influence of climate patterns on demand. ECO2—Strong sensitivity of demand to pollution.	

research has shown that the effect of group size depends on other SES variables and the type of management tasks to be conducted (Agrawal 2001; Ostrom 2009). Also, the existence of leadership in a community of users has been shown to be relevant. In this case, leadership positively influences the likelihood of self-organization (Baland and Platteau 1996). An

example is the positive effect of the presence of college graduates and influential persons in the establishment of irrigation organizations in 48 irrigation systems in India (Meinzen-Dick 2007). Tightly related to leadership, the level of social capital or, more specifically, sharing moral and ethical standards among users (i.e. norms of behavior) has also been shown to be important (Baland and Platteau 1996; Ostrom 2005). Its relevance comes from lower transaction costs in reaching agreements as well as lower costs of monitoring (Ostrom 2009). Furthermore, self-organization increases when group members depend on the resource system for their livelihood or they attach a high value to its sustainability (Chhatre and Agrawal 2008; Ostrom 2009; Wade 1988). Lastly, further considering the relation of users to the resource system, perceived costs of self-organization will be lower when users share a common knowledge of relevant SES attributes and how users are interconnected through their shared use of the ecological system (Ostrom 2009).

Three of the remaining variables move their focus away from users and incorporate instead attributes of the resource system. First, as in the case of users, the size of the resource system influences the capacity of self-organization for sustainable management. Also in this case, the relation with the likelihood of self-organization is not trivial. It appears that moderate size is most conducive to self-organization (Chhatre and Agrawal 2008), but still the size has to be big enough to generate significant flows of valuable products (Ostrom 2009). The productivity of the system has also been observed to affect the likelihood of users engaging in collective action. In this case, the variable has a curvilinear relationship with self-organization; it is necessary for users to experience some scarcity before incurring the costs of undertaking voluntary environmental actions, but the system still has to be sufficiently productive (Ostrom 2009). The last variable regarding the resource system is its predictability. Low predictability entails high uncertainty for users on the expected consequences from their actions. Therefore, it lowers users' propensity to engage in self-organization (Agrawal 2001; Ostrom 2009). However, it might also induce small-scale users to organize at larger scales to increase the predictability of the system (Ostrom 2009).

The two remaining variables are the mobility of resource units and the presence of supportive collective choice rules. The former deepens the ecologic aspects of SES by considering the stationarity of units. Stationary units entail lower costs of observing and managing a system, and therefore, self-organization might emerge more easily (Ostrom 2009). The latter, collective choice rules, is the only variable of the governance system that has been observed to affect the likelihood of users' engaging in collective action to self-organize. Full autonomy of users at the collective choice levels to craft and enforce some of their own rules reduces transaction costs as well as enabling them to defend the resource from the invasion by others (Berkes et al. 2006; Ostrom 2009; Wilson et al. 2007).

Recreational uses of natural CPR: tourism

CPR and voluntary environmental initiatives in tourism

The tourism literature identifies CPR as social dilemmas in tourism settings (Briassoulis 2002) and is beginning to consider the emergence of voluntary initiatives aimed at avoiding overuse. The tourism product, in general, is understood as both a composite commodity and a mixed good. Certain portions of the product are private goods, while others include collective or purely public goods, open-access commodities, and external consumption elements (Tisdell 2001). As such, a portion of tourism resources, including natural assets, are in fact tourism CPR (Healy 1994). Some examples are forest land, wildlife areas, lakes, river basins,

estuaries, pieces of shoreline, diving areas, fresh- and salt-water ponds, and caves (Healy 1994; Imperial 1999). All these are alleged to be subject to characteristic problems of overuse and lack of incentives for investment (Healy 1994).

There are examples of tourism destinations that have actually overexploited their CPR, thereby losing their tourism appeal and undergoing stagnation (Butler 1980; Knowles and Curtis 1999; Morgan 1991). These are examples of situations where, as the destination evolves, demand for tourism CPR increases until it becomes sufficiently large to induce agents to overuse resources, generating clearly suboptimal outcomes of destination stagnation. Nevertheless, stakeholders at some destinations have initiated voluntary initiatives to preserve their natural resources (see UNEP 1998; UNWTO 2002; 2004 for extensive lists of these initiatives), constituting viable alternative governance systems of the social-ecological setting in the tourism industry.

Among the varied motivations for voluntary environmental initiatives, demand effects, and non-monetary motivations are prevalent in tourism. The demand effects literature analyzes the market implications of product differentiation when consumers are concerned about environmental aspects of goods and services (e.g. Conrad 2005). In tourism, this literature has shown that, at least for a certain proportion of firms in mature destinations, it pays to undertake individual voluntary environmental action (Blanco et al. 2009b). More specifically, literature on uncertified voluntary practices in top European tourist destinations has shown either that more environmentally proactive groups enjoy significantly higher economic results (Álvarez Gil et al. 2001) or that environmental laggards significantly underperform (Carmona-Moreno et al. 2004). In addition, it has been shown that environmental practices positively impact customer satisfaction and loyalty, thereby improving the performance of firms (Kassinis and Soteriou 2005). Similar findings have been obtained for ecolabels. For example, Rivera (2002) finds that hotels with higher levels of environmental performance, and which are enrolled in ecolabels, charge about \$30 per night more than the room prices of non-member hotels.

In addition to monetary incentives, other non-monetary incentives are also in place in tourism. There is evidence of the relevance of norms of behavior and intrinsic motivation in tourism firms to perform in a greener manner. Peer pressure is exercised on firms not following norms of behavior, for example by controlling mechanisms for information sharing, and publicly reporting non-compliance with codes of good practices (Sirakaya 1997). Similar research reveals that intrinsic motivation in the form of personal morality has a positive relationship with involvement in voluntary environmental initiatives (e.g. Rivera 2002; Sirakaya 1997).

Thus, the emergence of voluntary agreements in the tourism industry is consistent with the broader finding that users of CPR frequently develop their own institutions, operating without formal governmental jurisdictions (Ostrom 2000). Hence, also in tourism, stakeholders can change the institutional context in which they are embedded, without needing external imposition.

Applying the SES framework to voluntary environmental initiatives in tourism

Despite the growing analysis of voluntary environmental action in tourism destinations, the tourism literature tends to ignore the dual social and ecological dimension involved in it. It is certainly acknowledged that natural CPR are an indispensable resource base for the integrity of the tourism experience at many destinations (UNWTO 2004). However, there is no analysis of the implications of tourism being a SES, e.g., that the interdependent relationships among tourism firms are mediated through their interaction with the

environment in the destination. This section shows how the SES framework can be applied to understand how combinations of variables affect the incentives and actions of tourism users under diverse governance systems. More precisely, the SES framework is used for structuring empirical evidence contained in the publication by the UNWTO (UNWTO 2002) on voluntary initiatives for sustainable tourism and in the UNEP (UNEP 1998) on ecolabels in the tourism industry.

The UNEP (1998) undertakes primary research on 28 ecolabels developed for the tourism industry, whereas the UNWTO (2002) addresses over 100 cases of voluntary initiatives. The latter study includes not only ecolabels (59) but also awards (17) and unilateral commitments (28). The UNEP report identified its cases based on the feedback to more than 400 questionnaires distributed to managers of ecolabel schemes, tourism and environmental ministries, national tourism boards, tourism industry associations, environmental NGOs, and educational and research centers all over the world. As a result, the report is based on general information and the history of 28 ecolabels, its labeling process and criteria, the technical and promotional support given to participants and its main achievements and future plans. The UNWTO followed a different approach to the identification of cases. It developed its report in collaboration with ECOTRANS (European network for sustainable tourism development) and OBF (a Canadian and American charitable organization with a vision for environmentally responsible tourism). These two organizations first identified all voluntary environmental initiatives of which they were aware, compiling more than 500 cases. This list was then reduced to those initiatives that continued existing at the time, whose primary focus was tourism firms, and that demanded certain activities or quality standards from participants. Systematic information on more than 70 issues was collected for each of the remaining 100+ schemes. Thus, these two reports are useful for understanding tourism and tourism evaluations insofar they are based on a broad set of cases all over the world and make use of systematic and factual information.

The main findings of these reports are the similarities and differences among schemes, jointly with the identification of factors that make them successful in terms of sustainable tourism development. Both the UNEP (1998) and the UNWTO (2002) consider successful cases to be those where the voluntary initiative is created and survives through time.³ As a result of organizing this empirical information under the SES framework, we see that the stylized facts of settings where tourism's voluntary initiatives have been successful partially coincide with previous findings in the CPR literature on the factors which increase the likelihood of self-organization, as defined in Section [Extractive uses of natural CPR](#).⁴ The information presented by the UNEP (1998) and the UNWTO (2002) studies particularly focus on the changes in the governance system (GS) brought by successful voluntary environmental initiatives, but also comprises changes in other components of the social-ecological system (see [Table 1](#)). However, little attention is given to the attributes of the ecological systems of destinations where voluntary environmental practices have been successfully developed, the number of users of these resources, or the presence of supportive collective choice rules.

³ However, it must be noted that evaluating a voluntary program on the basis of participation alone is not the most appropriate alternative. Even with very high participation rates, aggregate abatement can be very low if abatement by each participating firm is low (Alberini and Segerson 2002).

⁴ The study would have benefited from information on non-successful cases, which unfortunately was not available.

First, the UNWTO (2002) shows that successful voluntary initiatives are those whose objectives and goals are clearly identified. This requires a precondition of participants sharing a common understanding (U7) regarding awareness and acceptance of environmental issues and their capacity for action. This is easier to achieve when the resource system is salient to users (U8), i.e., when profits to firms depend on environmental quality. According to UNWTO (2002), this is one of the reasons why voluntary initiatives in tourism are more likely to be implemented in developed countries (RS9). Of the voluntary environmental initiatives analyzed in UNWTO (2002), 85% had their headquarters in a developed country. In developed countries, tourism has greater relevance to the economic sector and is subject to greater levels of competition (S5), since tourism destinations are more mature (RS5). In addition, environmental awareness by consumers and suppliers is stronger (S5), and therefore, the potential benefits of participating in voluntary initiatives are greater.

In addition, a second characteristic of successful voluntary initiatives, according to UNWTO (2002), is the existence of trust and respect among participants (U6). It is necessary for an initial level of social capital among participants to be in place, as well as trust-building activities over the course of the initiative's development (UNWTO 2002). In addition, a wider precondition related to social capital is the existence of political stability. It is widely accepted that tourists are highly sensitive to political instability, and this is a potential factor deterring the further development of a destination (Drakos and Kutun 2003; Kousis 2000; Pizam and Smith 2000).

According to the UNWTO (2002) and the UNEP (1998), when these preconditions are in place, a success factor for developing a voluntary sustainability initiative is the existence of highly recognized leadership with a strong personality or organization (U5). Other user factors related to success are the existence and adequate use of prior experience (U3) and the target group producing a comparable tourism product (U2). Also relevant is that the target group is capable of achieving significant improvements to the resource (O2). In this regard, two conditions are simultaneously necessary, on the one hand that the ecological system is renewable (RS5), and on the other hand that environmental requirements to enter the voluntary initiative are sufficiently stringent (GS5.b).

Another trait of successful initiatives, according to both the UNWTO (2002) and the UNEP (1998), is that entrance has to be conditioned on applicants meeting certain requirements, which should be proactive and entail environmental improvements significantly greater than legal compliance (GS5.b). This minimum threshold criterion is selected not only to guarantee that relevant environmental improvements are achieved with regard to main problems but also to guarantee that members can improve their image. However, there should be a balance between the effectiveness criteria and its realistic capacity of being implemented. Responses from surveys to the UNEP (1998) show that hard-to-meet criteria narrow the number of potential participants.

Entrance criteria constitute a type of boundary rule, since they specify who is eligible to enter a position and the process of determining which eligible participant may enter and leave. Not all criteria must be equally relevant for defining initiative acceptance (UNEP 1998). Implementation can be compulsory, delayed compulsory (with some extra time applied) or optional. The latter case is relevant insofar as it sends a message to participants that further actions can be implemented and specifies the direction of these activities. Other boundary rules identified by the UNWTO (2002) and UNEP (1998) are fees to enter, services included in fee payments, how long a partner must remain a member of the initiative, and the terms of use for a logo (GS5.b). All these rules must be public, clear and transparent (GS5.d). To get enough applicants, the target group has to have easy access to

the application process and be able to easily make first steps (GS5.b). In addition, fees must be affordable and compatible with the value obtained by participants (GS5.b).

Boundary rules must be revised to maintain the voluntary initiative in accordance with technological change and variations in the importance of environmental problems (UNWTO 2002). Consequently, aggregation rules specifying the mechanisms of change in requirements when necessary (GS5.c). Aggregation rules define whether a decision can be undertaken by a single agent or whether multiple participants are necessary prior to an action (Ostrom 2005).

In addition, the validity of boundary rules relies on the existence of mechanisms for deciding whether participants comply with requirements. This includes verification of the information provided by the applicant and evaluation of whether this supports acceptance into the voluntary initiative. If verification is to be undertaken, it requires a determination of the verification body responsible for providing written assurance of conformance with specified requirements (Font 2002) (GS5.a). Monitoring and assessment of the initiative's evolution are also accorded high relevance (GS8) (UNEP 1998; UNWTO 2002). Therefore, position rules are required for who has the responsibility to develop these tasks (GS.a). Verification, evaluation and other monitoring activities can be different in different situations. For example, verification can be undertaken by the operator of the scheme or by third parties; evaluation can be based either on quantitative or qualitative terms; and monitoring can be announced or not announced, regularly or irregularly (UNEP 1998). In addition, monitoring may address the number of applicants, number of members, members' degree of compliance with entrance requirements, the environmental results of the initiative and factors related to successes and difficulties (UNWTO 2002). In any case, the objective is to obtain information on the state of the initiative to which a partner belongs. Thus, information rules are required to define the treatment given to this information (GS5.d).

Information rules determine which information is available to participants about the structure of the situation, state variables and the behavior of other participants (Ostrom 2005). The types of information rules in place can facilitate the development of trust and consensus on objectives and goals (reinforce U6). These can strengthen the sense of group membership (reinforce U6) and permit firms to share know-how related to the initiative's objectives (I2) (UNWTO 2002). Then, the structure of communication channels for sharing information among users must be seriously considered (GS5.d). Within information management, the UNEP (1998) publication gives high relevance to technical assistance. Technical assistance is given high priority because many entrepreneurs, especially small- and medium-sized firms, find it difficult to identify environmental problems and solutions. Thus, the level of technical assistance should be related to the type and stringency of criteria and several mechanisms for providing these criteria to applicants should be used, such as initial checklists, reliance on process-driven criteria and site visits during verification processes.

Finally, for a voluntary initiative to be successful, it is necessary for firms to obtain a reward for joining. These rewards might result either from market forces or from payoff rules. Previous literature in Section [CPR and voluntary environmental initiatives in tourism](#) supports the notion that at least a certain proportion of tourism firms obtain higher economic results from undertaking voluntary environmental initiatives (O1). Thus, environmental attributes are valued by a certain share of the demand market (S5). In general, it is assumed that a voluntary tourism initiative is important for its members when it provides them with a positive image and reputation (UNEP 1998; UNWTO 2002) (GS5.e). The strength of voluntary initiatives is to provide high-quality information to external parties. Consequently,

marketing activities related to the environmental performance of members' voluntary initiatives constitute a basic success factor (GS5.e) (Font 2002; Mihalic 2000; UNEP 1998; UNWTO 2002). The use of a logo or the like is insufficient to move the demand market, and additional promotion and marketing are necessary (UNEP 1998). There must be a strong marketing concept reaching the target group (obtain applicants), consumers (generate image and reputation) and other stakeholders. The most widely used marketing mechanisms are press and media coverage, publication directories and online marketing.

In addition, it may be the case that certain payoff rules defining external rewards or sanctions for particular actions or outcomes are in place. For example, some successful voluntary initiatives establish immediate services offered to firms who become members (e.g., a telephone hotline or individual consultancy) (GS5.e).

Regarding interactions and outcomes, the UNWTO (2002) and UNEP (1998) conclude that all voluntary initiatives in their study have some positive effects on awareness raising, acceptance of environmental issues, learning, cooperation, product improvement and moving the market (O1). The UNWTO (2002), however, further notes that the quantity of participants in voluntary initiatives does not yet give a real choice to consumers worldwide (O1). Despite this, most voluntary initiatives have had excellent success in becoming agents of standards and guarantees of quality to consumers (O1). Voluntary initiatives have proven successful when participants confirm the benefits they obtained (I2), including saving money, gaining know-how, enhancing image and quality, increasing demand, and developing a sense of group membership and cooperation with other members. Lastly, voluntary initiatives that include public and private partners and that work to align different interests (GS1) seem to be more successful than others (UNEP 1998; UNWTO 2002). These have a higher level of transparency, along with improved requirements and recognition (O1). Nearly 50% of the voluntary initiatives analyzed by the UNWTO (2002) are led by, or strongly cooperate with, government organizations and non-governmental organizations (NGOs) (GS2).

Major difficulties to the success of voluntary initiatives include financial problems, declining interest and lack of impressive successes. An adequate funding structure, according to the UNWTO (2002), entails public programs (GS1) or private foundations (GS3) financing initial research creating the initiatives, development and implementation. The organization of the voluntary initiative and its partners must cover the general operation and marketing efforts, to which sponsorship might be valuable as long as it does not compromise the independence of the initiative. Finally, fees from members cover (part of) the direct costs for application and verifying compliance with requirements (GS5.d).

In addition, to complete the diagnostic approach, it is necessary to incorporate some of the well-known specificities of the tourism industry. First, as already noted, tourism uses of natural resources in nature-based destinations are mainly recreational. Therefore, tourism development does not imply *harvesting*, as do other uses studied by previous CPR literature. Consequently, it is difficult to describe the type of interactions in the SES based on the *harvesting* levels by different users, which is Ostrom's (2009) first second-tier variable in the interactions group (I1). This is a good illustration of the focus of previous CPR literature on extractive uses, extractive uses imply harvesting. A more general variable which could embrace the harvesting levels but also other type of stress imposed in the SES from different types of uses could be the *pressure* levels by different users. Using this re-famed second-tier variable, it is possible to incorporate in the analysis the fact that tourism generates soft individual environmental pressures comparable to pressures induced by residents, though aggregate pressures might still be substantial (I1) (Sasidharan et al. 2002). Second, residents and tourists share the same ecological system and develop quite

similar uses of it. Tourism operation may yield negative externalities to residents because of their use of natural resources (O3), even after undertaking environmental initiatives. Third, services are time-perishable, which means they cannot be stored, e.g., an empty room in a hotel cannot be stored for the next night and is therefore lost (Foster et al. 2000). Thus, the experience at most CPR that is a component of the tourism product (e.g., forestland, beaches) cannot be stored (RS8). Fourth, tourism is heterogeneous in terms of types of firms, all of which require their own infrastructure (RS4) (Foster et al. 2000). In addition, voluntary initiatives have been developed by different types of firms. These include accommodation, restaurants, sports and leisure, attractions and transportation (UNWTO 2002). Fifth, the existence of tour operators as intermediaries between demand and supply conditions market factors and competition (S5) (Calveras and Vera-Hernández 2005). Sixth, tourism demand is variable and volatile (S5). Users' demand for CPR in the tourism industry is subject to intra- and inter-annual changes (Briassoulis 2002). Tourism demand is often seasonal due to intra-annual changes in meteorological conditions (e.g., sunny weather is preferred for beach destinations while low temperatures and precipitation are preferred for ski areas) (ECO1). In addition, tourists are highly sensitive to negative shocks affecting tourism destinations. This includes political instability (e.g., terrorism, Drakos and Kutan 2003) (S3), pollution events (e.g., spills, Garza-Gil et al. 2006) (ECO2) and adverse climate episodes (e.g., climate change, Velarde et al. 2005) (ECO1).

How does tourism differ with previous CPR findings on voluntary environmental action?

The analysis in Section [Applying the SES framework to voluntary environmental initiatives in tourism](#) first illustrates that successful voluntary environmental initiatives in nature-based tourism destinations are complex SES. Second, as can be seen in Table 1, results on the attributes characterizing successful voluntary initiatives at nature-based tourism destinations are partially consistent with the evidence obtained until now on other CPR as presented in Section [Extractive uses of natural CPR](#).

Ostrom (2009) defends that the productivity of resource system has a curvilinear effect on self-organization. The tourism literature has long acknowledged a curvilinear relation between the productivity of a destination and the development of policy measures, as presented in the well-known Butler (1980) life cycle model. In accordance with this model, the number of visitors to a particular tourism destination will grow along time following a logistic function. This growth will induce overcrowding of the destination, inducing some scarcity of natural resources (among other types of resources). Only when destinations reach a status close to stagnation, where some scarcity is apparent but appeal factors to the region are not yet exhausted, will private firms and public administrations consider implementing environmental policies. According to this theory, after the stagnation stage, several scenarios are possible for the future of destinations. In some of these scenarios, the tourism activity still takes place, but in others the destination collapses. Butler (1980) stresses the relevance of the government to implement rejuvenation strategies so that the destination does not collapse. However, the analysis presented in Section [Applying the SES framework to voluntary environmental initiatives in tourism](#) shows that tourism users can voluntarily invest in costly abatement activities to reduce their aggregate impact without government coercion.

Also consistent with previous research on CPR, the salience of the resource to users appears to be a consistent attribute of successful voluntary environmental initiatives in the tourism studies under consideration. These are mostly located in developed countries. The

UNWTO (2002) attributes this result to the high relevance of tourism as an economic sector in these countries, high competition in the tourism sector, high level of environmental awareness from both suppliers and consumers and the high potential for benefits for firms if participating at voluntary initiatives. All these factors refer to the relevance of natural resources for the competitiveness of tourism firms. In addition, since natural CPR at tourism destinations are part of the tourism product, economic stakes involved in the sustainable management of these natural CPR are very large for the tourism industry and the economy of many regions. For example, estimates for Hawaii point to tourism representing 25–40% of GDP and 30–80% of jobs (Laney 2009). Therefore, a loss of environmental quality of the beaches and other natural amenities tourists want to experience would substantially compromise not only the future of the tourism industry but may influence the economic viability of the whole state.

Two other variables highly important to enable the emergence of voluntary environmental initiatives in tourism as in previous CPR research are social norms/social capital and knowledge of the SES/shared mental models.

The UNWTO (2002) and UNEP (1998) present these two as highly interrelated variables in the development of successful voluntary environmental initiatives in tourism. The UNWTO (2002) stresses the relevance of certain levels of trust and of agreement in problem definition regarding environmental concerns as a precondition for voluntary environmental initiatives. Further, both the UNWTO (2002) and UNEP (1998) highlight the key relevance of aligning social norms between members of voluntary initiatives as well as their mental modes regarding the SES for the initiatives to succeed over time. The most salient aspect in strengthening these two attributes is the careful development of information rules. This includes information on the state of the voluntary initiative and achieved outcomes, communication channels among members, technical assistance and information rules to guarantee the transparency of the initiative. Further, voluntary initiatives that survive over time are those which achieve, along its development, awareness rising among members, their acceptance of environmental issues and increased cooperation. According to Ostrom (2009), strengthening social capital between users of the SES reduces transaction costs in negotiations and facilitates reaching and maintaining agreements. In addition, a better understanding of the SES attributes and how users' actions affect each other through the use of the ecological system reduces the perceived costs of self-organization. This is consistent with evidence presented in the UNWTO (2002) and UNEP (1998).

A related relevant variable for the emergence of voluntary environmental initiatives in tourism, also identified by previous CPR literature, is the existence of strong leadership. The tourism literature has focused mostly to date on the leadership role of formal organizations, i.e., governmental or non-governmental organizations (UNEP-UNWTO 2005; UNEP 1998; UNWTO 2001, 2002), and less on the relevance of single individuals as previous CPR literature does (e.g., college graduates and influential elders in Meinzen-Dick 2007). The UNWTO (2002) refers to leadership arising either from a strong personality or from organization, but does not provide further details. The higher relevance of formal organizations on leadership in tourism might be due to the lower sense of community of users of natural resources in tourism than in other cases studied by previous CPR literature, or to a stronger market-oriented mindset.

However, results in tourism are only partially consistent with previous CPR literature. There are other variables that have been shown by previous field research on CPR to affect the likelihood of users' engaging in self-organization which are not stressed in the regularities of successful voluntary environmental initiatives in the tourism studies under consideration (UNEP 1998; UNWTO 2002). Using the SES framework helps identify

them. This includes the mobility of resource units, the predictability of system dynamics, the size of the resource system, the number of users and supportive collective choice rules.

When the CPR literature started considering the potential influence of the attributes of the ecological systems on self-organization by users, results showed that actually some ecological variables were relevant. Field studies all over the world have shown that the size of the resource system, the predictability of its dynamics and the mobility of the resource units that derive from it are all relevant variables for self-organization (Ostrom 2009). For example, recent research has shown that differences in the carrying capacity of resources are sufficient to the effectiveness of voluntary environmental initiatives in communities of users equal in all other aspects (Basurto and Coleman 2010). Applying the SES framework to voluntary environmental initiatives in tourism first illustrates the little attention that has been placed so far in the tourism literature to the attributes of the ecologic system on which tourism firms depend. This is particularly shocking when considering that the ecologic system precisely constitutes the basic appeal of many destinations. Thus, it can be hypothesized that the type of environmental attractions in destinations can influence the capacity of its users to develop voluntary environmental initiatives. The importance of the attributes of the ecological system in tourism should not be underestimated. Evaluating the capacity of the tourism industry to develop voluntary environmental initiatives ignoring the attributes of these can be strongly misleading. For example, the evidence presented in UNWTO (2002) and UNEP (1998) tells us nothing about the relevance of the mobility of the attractions in the destination. Are abatement efforts by firms exploiting the attractiveness of mobile wildlife, such as whales, lower than those of firms exploiting static attractions, such as Niagara Falls? Extrapolating evidence from previous CPR literature would suggest a positive answer, and still positive examples exist of codes of conduct among whale-watching firms (Sirakaya 1997). Similar questions for further research are pertinent regarding the ecological resource size, is the likelihood of voluntary action in tourism higher for medium-sized ecological systems (as supported by previous CPR literature) or is it higher for larger systems such as, for example, the Great Barrier Reef (an example for North Tropical Queensland can be found in Huybers and Bennett 2002)? Lastly, it can be hypothesized that the influence of the predictability of the resource system on self-organization is the same for tourism as for other CPR. But will evidence support it?

Second, using the SES framework also highlights the lack of attention given by the tourism literature to differences between destinations in terms of the number of users and the presence of supportive collective choice rules. The UNWTO (2002) and UNEP (1998) do not identify the size of the tourism industry in a particular destination as a factor influencing the development of successful voluntary environmental initiatives. Likewise, despite the focus of these studies on the governance attributes of successful voluntary environmental initiatives, they mainly address regularities in operational rules and no attention is devoted to the presence of collective choice rules. Are voluntary environmental practices not fragile to invasion by new users who do not follow greener practices? This has been shown to be a huge barrier, for example for achieving sustainable high seas fisheries (Berkes et al. 2006), whereas some coastal fisheries have been able to solve this threat when collective choice rules have enabled them to do so (Basurto and Coleman 2010). Are collective choice rules unimportant in tourism settings? It is difficult to think of a positive answer to this question given the large set of operational rules which have been identified as stylized characteristics of successful voluntary environmental initiatives in tourism. Operational rules are crafted in collective choice situations (Ostrom 2005), and therefore, the existence of collective choice rules giving tourism users some autonomy is a precondition for the effective development of operational rules by them.

The implications of this (partial) mismatch in findings in tourism with previous findings for other CPR are not straightforward. As Meinzen-Dick (2007) defends (in her case for water systems), it is difficult to say whether a variable was not important in previous research or the authors just did not make note of it. Thus, findings presented here open a path for further research.

Conclusion

This study contributes to the institutional and public policy literature by analyzing, from a social-ecological perspective, the attributes of successful voluntary environmental initiatives presented in two UN studies addressing the tourism industry. Voluntary environmental action by firms has been defended to be one of the most striking environmental developments over the 1990s (Lyon and Maxwell 2002). Such responsibility has gained prominence among business leaders, academics, investors and governments (Andrews 1998; Khanna 2001). The institutional analysis literature demonstrates that, in addition to command-and-control and market incentives, there is a wide range of alternative institutional designs for the governance of natural assets (Darnall and Carmin 2005; Delmas and Keller 2005; Mackendrick 2005; Ostrom 2005; Rivera 2002).

Scholarship on CPR has shown that resource users often create institutional arrangements and management regimes that help them allocate benefits equitably, over long periods, and with only limited efficiency losses (Agrawal 2001). The research on natural CPR has focused mainly on extractive uses, or on the provision of infrastructure to extract from these resources. This paper contributes to previous literature by analyzing tourism uses of natural CPR, which imply mainly recreational uses.

A review of the literature on CPR and voluntary initiatives in tourism shows that CPR situations have been described as social dilemmas and that these dilemmas have been alleviated in some circumstances by means of voluntary environmental initiatives. In the light of this evidence, the paper applies the SES framework (Ostrom 2007, 2009) to voluntary environmental initiatives by tourism firms as presented in UNWTO (2002) and UNEP (1998) to compare results with previous findings on extractive uses of CPR. Secondary analyses on regularities of successful voluntary environmental initiatives identified by these two UN studies have been used. Results support the relevance of some of the variables that previous research on CPR defends to affect the likelihood that self-governing initiatives emerge (Ostrom 2009). This includes the presence of leadership, shared norms of behavior among members of the voluntary initiatives, shared mental modes, importance of the resource for users and substantial productivity of the resource system. However, applying the SES framework to findings in these two studies helps identify other variables that have been shown relevant in non-tourism CPR situations which are not supported by this analysis. This includes most variables regarding the ecological system which constitutes part of the tourism product that tourism firms sell (its size, predictability and the mobility of its derived resource units) as well as the number of users and supportive collective choice rules that enable users to craft and enforce some of their own rules.

In the past, researchers on CPR also rarely focused on the attributes of the ecological system itself (Agrawal 2001). However, when including them in the analysis, the result has been that four of ten of the variables identified by field researchers as affecting the likelihood of users' self-organizing to manage their natural resources refer to the characteristics of the resource (Ostrom 2009). The obvious question then is were the variables of the ecological system which were not identified as one of the stylized characteristics of

successful voluntary environmental initiatives in tourism actually not important or did the tourism studies under consideration just not note them? If the former is true, the literature on CPR should expand the research to other type of uses of CPR to test the validity of previous findings in new context. If instead the latter is true, the literature on voluntary environmental action in tourism should adopt a coupled social and ecological approach when analyzing successful voluntary environmental initiatives. Similar comments can be made for the existence of collective choice rules and number of users. In summary, this paper believes that the use of the SES framework can provide academics and policy makers in tourism a heuristic for improving our understanding of tourism and voluntary agreements. As a result, we might better understand the effects of governance changes on the behavior of tourism stakeholders given specific characteristics of the ecological system of which tourism firms make use. Applying the SES is not the only line of research that can advance the CPR and voluntary environmental initiative tourism literature, but it is a relevant alternative.

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