

Tourism in Sub-Global Assessments of Ecosystem Services

Abstract

Published in 2005, the United Nations Millennium Ecosystem Assessment (UN MA) stressed that convincing governments, businesses and communities to address the supra-national challenge of limiting biodiversity loss and ecosystem degradation requires a far fuller understanding of the range of values and benefits people derive from ecosystems, including tourism. The UN MA was informed by, and has shaped, several conceptually- and methodologically-distinctive sub-global assessments (SGAs) of ecosystem services. Through a systematic content analysis, this paper examines how tourism features in 28 extant SGAs identified in a database held by a major supra-national environmental organization. Although they should have incorporated the widest range of specialist subject expertise, expert tourism scholars have historically played only peripheral roles in producing SGAs even for territories where tourism is a significant land use. Specifically, the SGAs examined did not benefit from the extensive body of knowledge relating to sustainable tourism. Problematic portrayals of tourism result which limit the ability of SGAs as management solutions. It is also contradictory to the ethos, principles and purpose of ecosystem assessments. With the ecosystem services approach set to become more important moving forward, the paper argues for greater acknowledgement of recent progress in sustainable tourism in ecosystem assessment.

Key words

Ecosystem services, sub-global assessment, sustainable tourism.

1. Introduction

Global economic development has been accompanied by natural resource depletion placing ecosystems around the world under intense pressure from which they may not recover (European Commission, EC, 2014). Published over a decade ago, the United Nations Millennium Ecosystem Assessment (UN MA) suggested the outlook is bleak. While humanity depends fundamentally on the earth's ecosystems for a wide range of values and benefits, ecosystems have changed 'more rapidly and extensively than in any comparable period of time in human history' (UN MA, 2005, p.1). The UN MA was an important clarion call for those seeking to influence governments, businesses and communities to address the supra-national challenge of limiting biodiversity loss and ecosystem degradation. Indeed, the UN MA has been regarded as 'a giant leap forward' (Daily, Kareiva and Polasky, 2011, p.3) in developing a common vision and conceptualization of the role that natural systems play in human welfare. The UNMA has been informed by, and has subsequently shaped, a series of sub-global assessments (SGAs) conducted at various spatial scales which have been characterised by their conceptual and methodological distinctiveness. Not only have the benefits from ecosystems (i.e. 'ecosystem services') been overtly linked with human well-being, but also a much wider range of (economic) values and benefits that people derive from particular ecosystems have been assessed than ever before (Ash, Blanco, Brown, Garcia et al., 2010; Chan, Satterfield and Goldstein, 2012).

The ecosystem services perspective looks set to grow further in importance not least because of acceptance by several supra-national organizations. For instance, European Union (EU) member states have been mandated to undertake national-level SGAs by the current EU Biodiversity Strategy to 2020 (EC 2014). There have been clear signs that the economic implications of this way of thinking are being taken seriously in business (e.g. World Business Council on Sustainable Development, 2011). Tourism should be considered within SGAs where it is an appropriate major 'local' land use.

However, to date, there has been no systematic attempt to examine the way in which tourism features or is understood in extant SGAs. This is an important oversight: tourism is a complex form of human activity that defies simple definition or straightforward categorisation (Hall, 2005). As tourism scholars have long recognised (Mathieson and Wall, 1982), the multiple roles and outcomes of tourism in economy, environment, society and culture require careful problematization (Mowforth and Munt 1998; Duffy 2015; Hunt, Durham, Driscoll and Honey, 2015), and they continue to defy straightforward resolution in approaches to sustainable tourism (Buckley, 2012).

The aim of this paper is to examine how tourism features in SGAs of ecosystem services through a content analysis of such (historical) documents. By their integration of science, policy and practices on themes of economics, conservation and development, by definition SGAs have to be compiled by inter- or trans-disciplinary teams (Braat and de Groot, 2012; Guimaraes, Balle-Beganton, Bailly, Newton et al. 2013), and they should be able to 'bridge gaps between different academic disciplines and research communities' (Milcu, Hanspach, Abson and Fischer, 2013, p.44). This paper argues that, in fact, tourism scholars (i.e. specialists) and their contributions have been overlooked in the production of many extant SGAs; more particularly, SGAs do not benefit from the extensive, well-established, mature body of knowledge relating to sustainable tourism (Ruhanen, Weiler, Moyle and McLennan, 2015). This is notwithstanding ecosystem services thinking and sustainable tourism share the same underlying logic and goals for development as well as intellectual and philosophical genealogies stemming from the Brundtland Commission (Saarinen and Rogerson 2014; Duffy 2015). This is also despite the importance of tourism in many territories covered by existing SGAs and exhortations for SGA authorship to be as inclusive as possible. Discourse has started to draw on constructs from ecosystem services in management solutions for sustainable tourism (Simmons, 2013; Whitelaw, King and Tolkach, 2014; Mayer, 2014). Other contributions have started to identify a range of health and well-being benefits from

tourism and outdoor recreation in a range of settings, as well as the methodological challenges in enumerating these (Pröbstl-Haider 2015; Romagose, Eagles and Lemieux, 2015; Willis 2015). Nevertheless, this paper will argue that the tourism academy –in the conventional sense of the term- has been peripheral to the production of extant SGAs. Before these arguments are developed further, we turn first to examine recent academic progress on ecosystem services. In particular we focus on where tourism may be conceptually located and positioned by scholars adopting this approach. This discussion frames the content analysis employed later in the paper.

2. Literature Review: Ecosystem Services, Culture and Tourism

Ecosystem services is a concept deployed in inter-disciplinary resource management. Its origins are in natural- and social-scientific debate concerning nature conservation, biodiversity protection and environmental sustainability, in particular at the interface between ecology and economics (Constanza, d'Arge and de Groot, 1997; Constanza, de Groot, Sutton et al., 2014). The core principle is to convey the many and varied contributions that ecosystems can make to human well-being. As such, the concept belongs within a utilitarian tradition of research and policy development (Fish, 2011). The natural world assumes normative significance for decision-making on the basis of what it 'does' for people. Hence, the main focus of an ecosystem services perspective is to understand the many and varied flows of human well-being 'benefits' that arise from ecological phenomena. Procedures may then be developed that can identify, model, value and propagate these in policy and/or practice decision-making (Ash et al., 2010).

Hence, one important aspect is to convey human dependency on ecosystems without being purely 'resourcist' in manner. By promulgating the language of 'services' and 'benefits' there is a deliberate shift away from viewing nature as merely an object to be protected against exploitative and/or disruptive human behaviour, towards

harnessing its life-giving and life-enriching qualities (UN MA,2005). This pointedly extends the conventional terrain of resource management (Fish, 2011). The natural environment is not only generative of fundamental benefits to human welfare –such as providing sustenance and securing livelihoods– but also more interpretative aspects of social and cultural re-production (Bhagwat, 2009). These may range, for instance, from the spiritual and mystical functions of landscape to the building of cohesive communities. Reflecting this, an increasingly harmonised fourfold framework for categorising ecosystem services has evolved, namely:

- *Provisioning services*: the products obtained from ecosystems, including food, fibre, fuel, genetic resources and fresh water;
- *Regulating services*: the maintaining functions of ecosystem processes, including regulation of air quality, climate, water quality and natural hazards;
- *Cultural services*: the contributions ecosystems make to processes of life enrichment, such as cultural identity, cognitive development and aesthetic experience; and
- *Supporting services*: processes that maintain the integrity, resilience and functioning of ecosystems and therefore underpin the production of all other ecosystem services, such as soil formation, photosynthesis, primary production and water cycling.

Comprehensive reviews have charted the development of this distinctive perspective (e.g. Potschin and Haines-Young, 2011; Milcu et al., 2013) which has also attracted lively critical debate (Robertson, 2012; Schröter et al., 2014). Of particular relevance here is that such thinking now cuts across, and increasingly harmonizes, diverse aspects of environmental planning (Burkhard, Petrosillo and Constanza, 2010) centred on two

arenas of science-policy innovation. First, ecosystem services are the operational concept of the strategically high-profile practice of 'ecosystem assessment' (Ash et al., 2010). This involves scientists and policy-makers gauging states and trends in ecosystem service provision in order to elevate priorities for the natural environment across government, business and civil society. The most influential example of this has been the pan-global Millennium Ecosystem Assessment (UN MA, 2005), commissioned by the United Nations Secretary-General and the series of related SGAs which provide the subject matter for this paper.

Second, ecosystem services underpin the so-called 'ecosystems approach' to natural resource management. Formatively associated with the International Convention on Biological Diversity (CBD, 1993) which adopted it as its primary framework of action, the ecosystems approach is essentially a set of principles for embedding consideration of ecosystem services into decision-making. This includes encouraging inclusivity and cross-sectorality, promoting adaptive management and local solutions as well as ensuring that the market and non-market value of ecosystem services are fully accounted for in policy, plan and project design (Ash et al., 2010).

Taken together, 'ecosystem assessment' and an 'ecosystem approach' are mutually-reinforcing contexts for the promotion of ecosystems services in the mediation of environmental futures: the former rooted in broad, science-informed advocacy of the natural environment; the latter in the methods and mind-sets of delivery. Both ideas actively cross-fertilize each other, sometimes to the extent that they are viewed as one and the same thing. This is not least because applications of the ecosystem approach often demands the process of ecosystem assessment. Key components of assessment methodologies (which structure the analysis below) include measuring the condition and trends of ecosystem service provision; identifying the drivers of change and their impact variables to show cause-and-effect relationships between services and human well-being over time (including through the scenario heuristic); and importantly,

providing commentary on the multi-dimensional responses across state, business and civil society required to affect change in normative terms (UN MA, 2005; Ash et al., 2010).

For an approach that ranges over, and seeks to incorporate, diverse connections between ecosystems and well-being, there are strong grounds for incorporating tourism beyond the general need to incorporate diverse disciplinary and sectoral interests (Braat and de Groot, 2012). In principle at least, tourism can be conceptualised in three main ways from an ecosystem services perspective. First, it is a sector that capitalises strongly on the values people have for natural environment assets. These may be individual economic valuation people pay for the natural environment they access for specific tourism activities or the shared dimensions of value which arise from the cultural, social or group experiences gained through tourism (Kenter et.al. 2015). The way in which ecosystems are managed therefore has a fundamental bearing on the tourism sector's capacity to reproduce itself as a particular set of mediations and experiences of nature. In this sense, the tourism industry may be viewed as an economic beneficiary of the contributions that ecosystem services make to well-being which was the focus of the UN MA which aimed to identify the benefits humans gain from interactions with nature including certain forms of tourism experiences such as ecotourism (UN MA 2005).. Second, tourism is predicated on resource dependencies across the full range of ecosystem services. Thus, it may be viewed as a driver of change on ecosystems service production in positive and negative ways in that mass tourism developments can fundamentally degrade terrestrial and marine ecosystems and their ability to support not just cultural services but also provisioning and regulating services as well.. Finally, tourism is a context in or through which (other) services from ecosystems are actively made. It is a sector that creatively constructs and re-constructs the well-being roles ecosystems play in peoples' lives. In this sense, tourism is more than simply a conduit of benefits from, and impacts upon ecosystems; it is a process in

which ecosystem services are produced by way of particular tourist products and 'offers'. For example, farm tourism now shapes the way food as a provisioning service is produced (Busby and Rendle 2000).

Notwithstanding their distinctive vocabularies and different intellectual terms of reference, these core ideas are hardly novel from the perspective of the body of knowledge produced by tourism scholars (that is, the 'tourism literature'). Indeed, there is already a strong conceptual fit between the idea that ecosystem services are mediated, consumed and created through tourism with existing scholarship in tourism studies on environmental sustainability. For instance, a growing body of work has emerged exploring the multiple relationships between tourism, health and well-being in both physical and psychological ways (cf. Nyaupane and Soudel, 2011; Chen and Petrick, 2013; Nawijn, Mitas, Lin and Kerstetter 2013; Ram, Nawijn and Peeters, 2013; Filep, 2014; Coghlan, 2015). Nevertheless, understanding of tourism starting from an ecosystem services perspective is currently heuristic and generally tentative. Several analyses of the peer-reviewed literature locate recreation and/or tourism as central to consideration of cultural ecosystem services (CES) (Hernandez-Morcillo, Pleininger and Bieling, 2013; Church, Fish, Ravenscroft and Stapleton, 2015). For Fish (2011, p.674), the focus tends to be on 'a rather underwhelming and predictable set of activities, such as types and patterns of recreation and (undertheorized) appeals to aesthetic value'. Part of the problem is that they encompass processes apparently less discernible, and therefore less studied, than those belonging in other classes of ecosystem service (Pleininger, Dijks, Oteros-Rozas and Bieling, 2013). The result is that tourism in general -and sustainable tourism more especially- have inherited places at the margins of this discourse.

3. Research problem, methods and data sources

Despite such limitations, the ecosystem services approach has gathered traction in recent times and, as a distinctive form of human activity, in principle tourism deserves attention in SGAs that are inspired by, and follow, the UN MA (2005). The remainder of this paper examines how tourism has featured in SGAs produced by a range of governments and non-governmental organisations. Specifically based on the discussion so far, it addresses three fundamental questions.

First, how is tourism understood in SGAs? Not only does this pertain to how tourism is conceptualized but also which particular forms of, or approaches to, tourism are identified. For instance, given their shared genealogies it may be reasonable to expect discussion of various facets of sustainable tourism to feature prominently in SGAs. Second, the ecosystem services framework is concerned with defining the benefits to well-being that flow from using and interacting with particular environments and identifying policy responses that can govern and help sustain these. This raises the question of what type/s of well-being benefit are commonly identified with tourism and, more specifically, how is tourism measured and valorised? Within this context, we may reasonably expect the significant progress in developing sustainable tourism indicator sets to have been embraced by SGAs (Miller and Twining-Ward, 2005; Torres-Delgado and Saarinen 2014). Finally, from an epistemological perspective, how has knowledge about tourism been produced in SGAs? The body of knowledge about tourism has grown rapidly in the past two decades as has the size and membership of the tourism academy which spans the arts, humanities and social sciences (Coles, Hall and Duval 2006; Benckendorff and Zehrer, 2013; Crouch and Perdue 2015). Hence, how far have published SGAs drawn on this growing published record and the scholarly networks that surround it?

An extensive content analysis was conducted in 2012 and 2013 which focused on CES within SGAs, that is, where tourism is routinely discussed. The listings of a major United Nations Environment Programme (UNEP) database were investigated. This

contained details of 82 ecosystem service assessments. The UN MA was not only a pan-global assessment but also multi-scalar in design. It involved a series of 18 UN-approved and 15 UN-Associated SGAs at different geographical scales, including pan-national regions, nation states and urban regions (UN MA, 2005), each of which was listed in this UNEP database. With some 'local' adaptation, both types employed the same conceptual approach and empirical apparatus. In addition, by 2012 UNEP had gathered information of varying scope on 47 SGAs postdating the UN MA process, including two far more extensive national-scale assessments for Japan (Duraiappah et al 2012) and the UK (UK NEA, 2011).

[Insert Table 1 near here]

Ultimately, 28 SGAs were retained for detailed content analysis (Table 1). Fourteen of the 82 were immediately discarded. In these cases, an assessment had taken place but UNEP did not have an accessible record. Its database holdings were in summary form or secondarily derived from other sources, such as related policy documents or a UNEP survey of assessment authors. Eleven assessments were eliminated because they entirely overlooked CES and therefore tourism. For a further 29 discounted assessments, it was not possible to obtain sufficient (English-language) material to undertake rigorous analysis. Several SGAs in the database, including UN-Associated and -Approved assessments, were no longer publically-available on web sites or in paper form. Some assessments were available in languages in which the researchers were not competent.

Of the 28 remaining SGAs, only half mentioned tourism as a CES. The other 14 SGAs were nevertheless inspected to ensure that substantial material on tourism and ecosystem services was not overlooked in error. Eleven mentioned tourism in passing when considering the processes causing alterations in ecosystem services. For example,

in a 142-page Canadian study of ecosystem status and trends, tourism is cited just once as a factor contributing to coastal erosion (FGPTC 2010).

[Insert Table 2 near here]

There are numerous approaches to content analysis (Krippendorf, 2013). This research combined a series of basic quantitative measures with a qualitative approach to the textual content of the SGAs (Schreier, 2012). Standard metrics were compiled (i.e. word counts, page length, positioning of information, authorship and so on) as surrogate indices of issue importance (Table 2). Separate in-depth readings were made by two researchers who then compared their findings. Three major themes emerged from the readings: conceptualisations of tourism in SGAs; tourism in measures in SGAs; and tourism as drivers of change that affect ecosystems and related services. These should not be surprising. After all, eleven of the 14 SGAs were UN-approved or -associated. Although the reading process started without pre-ordained views, these themes reflect emphases in the protocols for undertaking ecosystem assessments as recommended by the MA (2005) and elaborated in the related literature. These include: utilising a conceptual framework; measuring ecosystem services; and identifying the implications for human well-being of changes in ecosystem services and how these are affected by key drivers of change (Ash et al., 2010). The three themes are discussed in turn below but the next section starts by assessing how tourism was present in SGA texts more generally.

[Insert Table 3 near here]

4. Analysis: tourism in SGAs

As Tables 2 and 3 indicate, there were marked differences in the size and scope of the 14 SGAs that were analysed in depth because they mentioned tourism. One major national assessment, the UK report at 1,452 pages, is much longer than any other document and hence measures are also provided for its shorter synthesis report. This is 79 pages and can be compared to most of the other assessments which range in length from 21 to 166 pages (Table 3). Nine documents comprised final reports among which three were given slightly different titles (cf. Coastal British Columbia, Southern Africa and Portugal). Among the other five assessments, three were summary reports as they were the only documents available; one (Glomma Basin, Norway) was a pilot assessment for a proposed national study; and another (Switzerland) was termed an assessment framework and methodology but included analysis and data on ecosystem services.

Measures of word count are, of course, relatively blunt instruments for gauging issue importance. The number of words devoted to topics was affected by the varying length, layout and production values of each SGA. Page 'mentions' proved more useful and in eight of the 14 texts, 9% or more of the pages focus on CES. Some assessments, such as the Caribbean Sea and San Pedro de Atacama (Chile), had entire sections on tourism. The large-scale UK assessment contains a list of 124 key findings of which 11 are focussed on tourism. Nevertheless, in general within each SGA except Coastal British Columbia (Canada) tourism is considered both within *and* beyond the section on CES. For example, tourism is mentioned on 69% of pages in the Greater Jakarta Bay (Indonesia) assessment whereas the section on CES constitutes only 9% of that text. Consideration of tourism beyond CES typically occurs in sections on drivers of change (in which tourism is considered as a key factor that has recently altered other ecosystem services) and in scenario analyses which outline future decision options. For example, the Caribbean Sea assessment contains a 29-page annex on future scenarios of which 20 pages make mention of tourism as an ecosystem service *per se*. In fact, in eight of the 14 assessments, tourism is mentioned on 23% or more of the pages. Some care must be

taken not to over-read the importance of tourism. With the notable exception of the UK assessment, the terms 'tourism', 'recreation' and 'leisure' are used in a conceptually conflated, undifferentiated manner. Other assessments use the term 'recreation' in their accounts of CES and (day) visitors are often confused with, or described conveniently as, 'tourists'.

A marked diversity is evident in the spatial extent, habitats, degree of urbanisation and development of tourism in the locations covered by the SGAs. They include locations in all continents except Antarctica, a range of states in both the global north and south, and contrasting tourism destinations. These vary from San Pedro de Atacama (Chile) that receives 50,000 visitors per annum to the Caribbean Sea area that attracts 25 million visitors a year. In some locations, such as the Caribbean Sea, tourism is a central element of the local economy. In others, such as the Laguna Lake Basin (Philippines), tourism development is limited while in the Glomma Basin (Norway) it is a relatively small but growing industry. Significantly, tourism is acknowledged in ecosystem assessments even where it is not a major sector in the economy. However, more space in assessments is devoted to tourism where it has a major presence within multiple destinations (Table 3). For instance, tourism is one of only two ecosystem services considered in-depth in the Caribbean study (the other is fisheries). The Northern Range of Trinidad assessment describes tourism as part of CES for which it reports demand is already high and expanding. By contrast, CES comprises less than 3% of page length for Coastal British Columbia (Canada) or the Coffee growing regions of Colombia, and hence tourism receives limited consideration. With such variations in attention, it is not surprising that in some studies tourism is discussed in a very generalised manner, a point to which we return below.

Each assessment was undertaken between 2002 and 2012 and some indicate they have learned from their predecessors (e.g. UK in 2011). There was no evidence that the date of assessment affected the scope or depth of coverage of tourism. There

are both early (e.g. Glömma Basin, Norway in 2002) and later (e.g. Japan 2012) assessments containing significant volumes of material on CES and tourism. Despite its apparent importance, there was little evidence that recognised tourism experts (i.e. from within the established tourism academy) contributed to the compilation of assessments. Guidance for undertaking ecosystem assessments proposes that expert authors should be drawn from a wide variety of disciplinary backgrounds and should include practitioners as well as academics (Ash et al., 2010). As a result, authorial teams are often large in number and they include lead authors as well as extended teams of co-authors for specific chapters or sections of the assessment. In some cases, these arrangements are complex. For example, the Japanese assessment cites 170 authors, many working on the six cluster reports for specific geographical sub-areas of Japan, and of these 39 contributed to the main national assessment.

For just eight of the 14 assessments, sufficient detail of the author teams was provided. This means that for over a third of the assessments in which tourism is invoked as a significant activity, it is impossible to ascertain who is responsible for drawing conclusions about tourism and on the basis of what credentials. Indeed, only four of the eight SGAs providing author details identified tourism and/or recreation specialists in their teams. Usually these were a small number of specialists within large teams so that, of the 228 authors whose backgrounds were examined, just ten (4.4%) authors claimed tourism and/or recreation expertise. Of these five were associated with a university and the other five were from practitioner/consultancy backgrounds. Tourism analysis was routinely undertaken by authors whose disciplinary backgrounds were described primarily as being in economics or ecology. The involvement of economists in part reflects the (financial) valuation of services as a key component of ecosystem assessments (Ash et al., 2102).

4.1 Conceptualisations of tourism in ecosystem assessments

The broad analysis of content reveals clear variations in the level of interest in tourism. In part, this is due to the flexibility imbued in the UN's guidelines for undertaking ecosystem assessments to acknowledge location-specific contexts. In principle, though, this should have resulted in the identification of multiple and varied tourism types, as they relate to market characteristics in the areas under assessment.

Some assessments, such as that for Glomma Basin (Norway) discussed multiple types of tourism in different habitats. However, they were in the minority and, instead as Table 3 indicates, the conceptual approach led to a narrow focus on specific types of tourism. As may perhaps have been anticipated, there was a heavy emphasis on 'ecotourism', broadly conceptualised, which is considered in eight of the 14 assessments. The significance of animal species is manifest in the fact that six assessments discussed hunting as a form of tourism reliant on ecosystems. Just three assessments considered farm based- or agri-tourism as a significant feature of pluri-active agricultural systems and economies. In some assessments, such as that for Southern Africa, eco-tourism is considered alongside nature-based tourism. The differences between the two are not explicated although nature-based tourism is often inferred to involve hunting and fishing.

In no assessment is there a clear rationale for focusing on ecotourism. Rather, its relevance appears to have been assumed: since the conceptual framework seeks to highlight the benefits humans gain from ecosystems, 'ecotourism' must be the most appropriate moniker. This is without any further detailed scrutiny of the term and its meaning, nor cross-referral to long-standing definitional discourse among tourism scholars in the 'tourism literature' (Fennell, 2001; Donohoe and Needham, 2006). Perhaps as a consequence, the discussions of ecotourism in SGAs are often relatively optimistic and uncritical about its economic and environmental roles compared to more critical or discerning academic analyses (cf. Butcher, 2005; Weaver and Lawton, 2007; Fennell, 2008; Duffy 2015; Hunt et al., 2015). Assessments surprisingly overlook that in

some locations the commodification of nature for 'ecotourism' can result in negative, as well as positive outcomes for local communities in terms of fostering sustainable livelihoods and ecosystems (Stronza and Gordillo, 2008; Hunt et al., 2015).

Emblematic of these issues, ecotourism is devoted 6% of the word length of the India Urban Resource assessment. Somewhat simplistically, ecotourism is argued to have certain advantages over other forms since tourists are willing to pay entry fees to such sites which provide incomes to local communities and small businesses. The report concludes that,

'eco-tourism inside the city would be a big business worth [Rupees] Rs. 1 million at Rs. 10 per person per morning trail. Its economic contribution in terms of health security & cultural satisfaction would be recognised as much higher.'

[Naturalist, 2005, p.16]

Similarly, the Southern Africa assessment argues that nature-based tourism can contribute to management that has positive implications for conservation and improvements in a range of ecosystem services concluding that the,

'combination of private game farming, trophy hunting and nature-based tourism has expanded the conservation estate to a remarkable degree'.

[Biggs, Bohensky, Desanker et al., 2004, p.29]

Within tourism studies however, there has been extensive problematization of ecotourism and nature-based tourism (Weaver and Lawton, 2007; Fennell, 2008; Newsome, Moore and Dowling, 2012; Duffy 2015). Ecotourists and nature-based tourists do not form homogenous or singular groups as they are generally portrayed in SGAs. Rather, tourism research has identified different sub-types of ecotourists and

nature-based tourists (Mehmetoglu, 2007; Arnegger, Woltering and Job, 2010; Deng and Li 2015). Not only do these types vary in their connections to nature but also the benefits they gain from, and contribute to, ecosystems. As a result they pose quite distinctive environmental management challenges.

Finally, beyond 'ecotourism' other interpretations of tourism are naïve and truncated. For instance, despite their emphasis on CES, some SGAs entirely overlook other tourism market segments that are clearly dependent on local 'nature', such as food and drink-related tourism (Hall and Gössling 2013) or agri-tourism (Sznajder, Przezborska and Scrimgeour 2009; Torres and Mommsen 2011). Where other categories of tourist are identified, they too are largely considered in simplistic and undifferentiated ways. Cruise tourists are subject to the same reductionist tendencies as ecotourists despite similar progress in tourism studies in identifying different types and their implications for destinations (Papathanassis and Beckmann, 2011). Moreover, at the heart of ecosystem assessment is understanding the effects of drivers for human well-being (UN MA,2005). However, by and large discussions about how tourism is related to different forms of material and non-material human well-being (cf. Chen and Petrick 2013; Filep 2014; Romagosa et al., 2015; Willis 2015) are simply overlooked and not invoked in SGAs. Indeed, discussion of well-being is one-dimensional in the few instances where it is mentioned. The Caribbean Sea assessment focuses on the economic aspects of well-being; the San Pedro de Atacama (Chile) study argues that the major impact of tourism on well-being is linked to changes in traditional ways of life; and the Northern Range of Trinidad assessment takes a far more extensive view by identifying how tourism contributes to well-being through economic activity, recreation and social relations.

4.2. Tourism in measures in SGAs

SGAs are expected to contribute to evidence-based policy-making on ecosystem futures. Not surprisingly standard measures of tourism activity are integrated in ecosystem assessments. However, they are routinely used in SGAs in an unquestioning manner without consideration of critical issues or limitations identified in tourism research.

In the nine SGAs using basic measures, the most common are visitor numbers, expenditure and tourism employment. For example, the San Pedro de Atacama (SPA) assessment confidently asserts that,

‘the SPA is one of Chile’s best known tourist destinations.....amongst the top eight destinations in the country for foreign tourists. Over fifty thousand people are estimated to visit the municipality every year and over 60% of these are foreign tourists (mainly Europeans, particularly French tourists). In 2000, it was estimated that tourism in SPA brought in over five million US dollars in foreign currency. Due to its importance, part of the SPA municipality was declared a Zone of National Tourist Interest.’

[RIDES, 2005, p.21]

In some assessments more complex economic valuations are provided in order to highlight the economic benefits of improved environmental management and conservation. For example, the UK assessment incorporates detailed estimates of non-market forms of tourism and recreation (e.g. day visits to the countryside) alongside market goods (e.g. food and timber). This makes a significant difference to the resulting economic values and policy options in terms of measures to facilitate land use change.

Other SGAs lack a similar level of analysis and instead their reliance on basic measures has connotations for how tourism is understood and factored into decision-making. This is because, with the exception of the Laguna Lake Basin (Philippines) assessment, such measures all show apparent increases in tourism: in other words, the

condition of CES is improving. However, the latter (visitor numbers) may point to an altogether different story (about pressures on ecosystems and carrying capacity). Indeed, few assessments simultaneously demonstrate how tourism interactions with ecosystems are more complex, generating both benefits and threats. One exception, the Greater Jakarta Bay (Indonesia) assessment notes that,

‘Tourism activities could economically bring benefits not only to the local government but also to local communities. However, the number of tourists may need to be controlled as the increase in number of diving and other tourist related activities on the islands (including coastal development to support tourism) can have a negative impact on the condition of ecosystems surrounding tourist areas.’

[Arifin, 2004, p.9]

Overall, consideration of the negative dimensions of tourism in assessments is restricted to instances where expansion has been relatively rapid, such as cruise tourism in the Caribbean Sea or coastal tourism in the Portugal assessment. Furthermore, although each assessment views tourism as a benefit humans gain from ecosystems, only eight assessments acknowledge the potential or actual contribution of tourism to environmental degradation.

These discussions of the contrasting impacts of tourism raise a challenge that is routinely missing from assessments and which reflects wider problems with CES (Chan, Satterfield and Goldstein, 2012; Bieling and Plieninger, 2013; Hernandez-Morcillo et al., 2013): that is, what constitutes an appropriate measure(s) of tourism and recreation as ecosystem services (since growth in visitor numbers may create significant dis-benefits)? Seven assessments use standard, readily-available tourism visitor and employment data usually gained from national or local sources. For example, the

measures for the Glomma Basin (Norway) assessment of 90,000 coastal fishing tourists and 350,000 pleasure boats located on the coast come from national statistics. The Greater Jakarta Bay (Indonesia) survey draws general conclusions about tourism and recreation based on a local survey of the number of visitors and holiday cottages on the islands in the bay. Just two of the assessments make use of recognised international sources of tourism data to evidence their positions. For example, the Caribbean Sea assessment employs data from the World Travel and Tourism Council, the Caribbean Tourism Organisation and Oxford Economic Forecasting.

Reliance on national and local sources is problematic. As is well established in tourism studies, many secondary data sources, such as those produced by national tourism organisations have significant limitations (Page and Connell, 2009; Lam and McKercher, 2013; De Cantis, Parrocco, Ferrante and Vaccina, 2015) while the design and interpretation of local-level studies of the economic impacts of tourism is highly contestable (Crompton, 2006). Moreover, different visitor types and segments can generate very different interactions with local landscapes and environments (Dolnicar, 2010; Arnegger et al., 2010). Simple measures of tourism activity of this type used in SGAs almost inevitably gloss-over the findings of much tourism research which reveals how complex arrays of economic activities combine to produce 'visitor experiences' that tourists consume, and all of which should be addressed in considering management options (Hall and Page, 2014; Weidenfeld, Butler and Williams, 2011, 2014; Benur and Bramwell 2015).

4.3 Tourism as driver of change

Many assessments discuss the challenges tourism raises for developing management options in ecosystems and habitats. For example, the Northern Range of Trinidad assessment notes how significant conflicts arise from the management of natural

environments to deliver different ecosystem services including mass tourism arguing that,

‘High and growing demand for the use of the coastal resources for recreation, tourism enterprises, fisheries, anchorage and sea transportation, and conflicts among these activities for use of limited resources, have implications for sustainable management.’

[Northern Range Assessment, 2005, p.xvi]

Such a comment also exposes a key conceptual challenge of addressing tourism within the ecosystem services framework. In eight of the 14 assessments, tourism in general was identified as both a service producing benefits for humans and a driver or cause of ‘ecosystem change’. For example, in the Japanese assessment tourism is identified as a significant impetus for a major transformation,

‘There is a renewed and growing interest within Japan to revive these traditional rural landscapes called *satoyama* and *satoumi* but within the context of modern Japan.....the increasing demand for eco-tourism has been a driving factor for *satoyama* and *satoumi* renaissance.’

[Duraiappa, Nakamura, Takeuchi, Watanabe and Nishi, 2012, p.2]

Nine of the 14 assessments discuss tourism using the term ‘driver’ or ‘driving force’. This is because such terms are part of the UN MA apparatus which suggests SGAs should identify drivers of change to inform policy debates. Drivers are natural or human-induced factors that directly or indirectly cause a change in an ecosystem service. Conceptually, they may be divided into primary drivers (e.g. population change) and proximate drivers which are pressures (e.g. harvesting). They may be further

differentiated into drivers that are endogenous or exogenous to the territory of the SGA. The nine SGAs that consider tourism as a driver of change adopt varied approaches. Two assessments (Caribbean Sea and Greater Jakarta Bay) consider tourism within socio-political drivers since it is the lack of regulation of tourism that is perceived to be degrading natural environments. In the other seven assessments mainly economic processes are discussed. Changes in demand or market segments lead to a growth in tourism which drives change in a range of ecosystem services. For example, the SGA for Portugal identifies international tourism markets as an exogenous driver of change, while demand for second homes and the activities of the construction sector are an endogenous driver degrading certain coastal ecosystems. Similar to the discussion of ecotourism and tourism data above, as a driver of change tourism is treated in a relatively simplistic and unproblematic manner when compared to academic studies. For instance, the different forms of demand that contribute to tourism as a driver are routinely ignored although some assessments (e.g. Portugal and Caribbean Sea) compare demand; nevertheless, this is still at a relatively coarse level differentiated only in terms of domestic and international tourism. Indeed, the wide array of 'drivers' of change in tourism demand, not to say the methods and approaches to forecasting tourism demand that are much debated in tourism studies (Song and Li, 2008; Athanasopoulos, Hyndman, Song and Wu 2011), receive very limited attention within the SGAs in this research.

5. Discussion and Conclusion

Since the publication of the United Nations Millennium Ecosystem Assessment, interest in ecosystem services has gathered momentum globally. Judging by the published record in the academic and grey literatures, it will continue to do so as the policy implications of the UN MA are played out by a range of actors and as the professional

norms that guide this area become further established. Several now historical SGAs of varying spatial scope have both informed, and been shaped by, the UN MA. In turn, extant SGAs have inspired, and will act as a foundation for, subsequent SGAs. As a major form of land use, opportunity exists within the conceptual framework of ecosystem service assessments to incorporate tourism and tourism-related activities where they represent benefits to human well-being from ecosystems and biodiversity. There is also opportunity for SGAs to be informed by recent progress in sustainable tourism.

There are though only superficial signs that tourism is being afforded the attention it deserves in this way of thinking. In half of the 28 SGAs available for inspection here tourism was incorporated in the assessment of CES; that is, where practical guides (Ash et al., 2010) and academic commentaries (Plieninger, et al., 2013) argue it is most appropriate and hence likely to appear. Among these existing texts tourism was understood and portrayed in a rudimentary manner through simplistic analysis and language. Routinely, tourism, leisure and recreation were conflated. At a basic level, there was little attempt to differentiate between tourists and (day) visitors either as beneficiaries from ecosystem services, or as potential drivers of ecosystem change. Some tourist types also reliant on ecosystems and biodiversity like agri-tourists, food-and-drink tourists were overlooked altogether. Other categorisations of tourist types, such as eco-tourists and cruise tourists, appear used for convenience and neatness of labelling and in many cases can be questioned for their conceptual relevance and appropriateness. No reference was made to long-established debates and critical exchanges in sustainable tourism, nor on issues such as drivers for tourist behaviour and tourism demand. Clearly, this will be an anathema for many tourism scholars. Perhaps more importantly, it is testament to the near absence of tourism specialists more widely or specifically experts in sustainable tourism from assessment teams. Indeed, the 'specialists' were economists or ecologists who, for the most part, failed to

engage with established ideas and cutting-edge thinking from scholars in the tourism academy (in the conventional sense).

The outcome is a series of partial and stylised representations of tourism in SGAs which is at best limiting, at worst potentially misleading when both the principles and the purposes of ecosystem assessment are considered. Tourists are mainly seen as the source of monetary benefits from ecosystem services for local communities and the social and cultural roles of tourism are obscured. There is a heavy reliance on secondary data sources to deliver simple tourism-related metrics and indices, with reference to discourse on either the limits of national and international tourism data sets or the difficulties in producing robust indicators sets in sustainable tourism. Instead, such sources are used in unproblematic ways without a thoroughgoing acknowledgement of their limitations, and they tend to portray uncritically the commodifying of ecosystems for tourism as apparent benefits. Overall tourism in SGAs is viewed from a highly utilitarian and instrumental perspective which, paradoxically, the wider ecosystem approach was originally intended to overcome.

Hence, this analysis is important not only because it reveals another instance of knowledge production and dissemination about tourism beyond the usual channels associated with the subject (Wardle and Buckley, 2014). It also presents compelling evidence of a lack of appropriate interaction and knowledge exchange between two significant fields of study which is to their mutual loss. Tourism scholars in the established sense have played too peripheral a role in an applied approach that has, according to Potschin and Haines-Young (2011, p.575), 'taken on many features of a classic Kuhnian paradigm'. This is somewhat surprising since a major characteristic of tourism research normally is to embrace the potentials of knowledge production across discipline boundaries to address major global challenges (Coles et al. 2006; Darbellay and Stock, 2012; Benckendorff and Zehrer, 2013). Within United Nations policy architecture on global environmental change, biodiversity is important as climate

change (Loreau et al., 2006). The tourism academy has contributed to shaping the global agenda on climate change through the IPCC (Amelung, Moreno and Scott, 2008). However, it has not been at the forefront of debate about biodiversity as it relates to ecosystem services, although the United Nations World Tourism Organization has made strenuous efforts to promote biodiversity as a theme (UNWTO, 2014). This is also disappointing because more powerful approaches to valuation have notable potential to contribute to unfolding tourism dialogues on so-called 'green growth' and the 'green economy' (Hall 2013; DeLacy, Jiang, Lipman and Vorster, 2014; Duffy 2015).

Viewed from the position of ecosystem services, it is equally curious that the benefits of engaging with the tourism academy, in particular in the area of sustainable tourism, have not been fully recognised. Some initiatives may start to remedy this situation such as the EU COST TobeWell network (Vargas Sanchez, 2013). For its advocates, one of the central tenets (and relative strengths) of the ecosystem services perspective is that it is capable of delivering enhanced environmental management. This should be achieved by documenting and extending understanding of the range of benefits from biodiversity and ecosystems, and how these play out in an array of uses of land and marine systems. There are very few environmental contexts tourism has not penetrated to one degree or another. In order to deliver assessments to such a wide specification, inter-disciplinary teams are necessary that will benefit from the widest range of relevant expertises and knowledges from across the social and physical sciences, arts and humanities. Set in this context, it is all the more perverse that expert tourism scholars and mature bodies of knowledge, especially relating to sustainable tourism, are at best overlooked, at worst excluded despite the undeniable importance of this form of human activity. The more pernicious and sobering prospect is that the current state of affairs may result in erroneous conclusions, recommendations, and policy decisions about future tourism activity. Unless there is greater acknowledgement and utilisation of recent progress in tourism studies, not least in the field of sustainable

tourism, the raison d'être for applying the ecosystem approach is disputable. In effect, an admittedly more extensive approach which has replaced its allegedly deficient predecessors, nevertheless still omits key data and perspectives.

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Table 1: Stages of selection process

Stage	Criterion	Number removed	Number remaining
Start	Assessments cited in UNEP database	-	82
Stage 1	Removal of assessments with insufficient information to identify the ecosystem services analysed	14	68
Stage 2	Removal of assessments that did not consider CES	11	57
Stage 3	Removal of assessments for which access in the English language was unavailable or English-language material was a very short summary of less than 2 pages.	29	28
Sample			28

Source: authors

Table 2: The 14 SGAs subject to content analysis

Location	Date completed	Link to UN MA	Type of assessment document	Citation†
Caribbean Sea (CARSEA)	2007	Approved	Final report	Agard, Cropper, and Garcia (2007)
Coastal British Columbia, Canada	2004	Approved	Final report ¹	Coast Information Team (2004)
Coffee-growing regions of Colombia	2004	Associated	Final report	Armenteras, Rincón, and Ortiz (2004)
Norwegian Millennium Ecosystem Assessment Pilot Study plus case study of Glomma Basin, Norway	2002	Approved	Pilot assessment	Norwegian Directorate for Nature Management (2002)
India Urban Resource	2005	Associated	Summary report	Naturalist (2005)
Greater Jakarta Bay Indonesia	2004	Associated	Final report	Arifin (2004)
Japan (<i>Satoyama-satoumi</i> ecosystems)	2012	Not linked	Summary report*	Duraiappa, Nakamura, Takeuchi, Watanabe and Nishi (2012)
Laguna Lake Basin, Philippines	2005	Approved	Final report	Lasco and Espaldon (2005)
Northern Range of Trinidad	2005	Approved	Final report	Northern Range Assessment (2005)
Portugal	2004	Approved	Final report ²	Pereira, Domingos, and Vicente (2004)
San Pedro de Atacama, Chile	2005	Approved	Executive summary	RIDES (2005)
Southern Africa Millennium Assessment	2004	Approved	Final report ³	Biggs, Bohensky, Desanker et al. (2004)
Switzerland	2011	Not linked	Assessment framework and methodology	Staub, C., Ott, W. et al. (2011).
United Kingdom.	2011	Not linked	Final Report and Synthesis Report	UK National Ecosystem Assessment (2011)

* 445 page final report of assessment not analysed as only certain sections are available in English

† As suggested by authors

¹ - entitled Ecosystem based management framework

² - entitled, State of Assessment Report

³ - entitled, Integrated Report

Source: authors

Table 3: Content measures for each SGA

Assessment	Total pages*	No. (%) on CES specifically	No. (%) mentioning tourism	Other measures of tourism content	Main types of tourism considered
Caribbean Sea (CARSEA)	51	15 (29%)	27 (52%)	5 pages of 10-page section assessing the state of ecosystems, focus on tourism. 20pp of a 29-page annex on scenarios consider tourism.	Mass Niche Coastal Beach Cruise
Coastal British Columbia, Canada	21	Less than 1 (3%)	0	1 mention of recreation as a cultural feature that can be protected in conservation reserves	In conservation areas
Coffee-growing regions of Colombia	30	Less than 1 (3%)	2 (6%)	Very limited discussion of cultural services and ecotourism is only cultural service discussed	Ecotourism and national parks
Norway / Glomma	90	20 (22%)	13 (14%)	The products of 6 ecosystem types discussed and recreation is mentioned under all 6.	Alpine Ecotourism Nature-based Outdoor life and recreation (i.e. fishing hunting swimming boating)
Indian Urban Resource	28	5 (18%)	4 (14%)	Section focussed on ecotourism contains 200 words out of a 3,500 word summary report	Ecotourism
Greater Jakarta Bay Indonesia	23	2 (9%)	16 (69%)	1 page focuses on tourism	Coastal Coral reef Diving

Japan (<i>Satoyama-satoumi</i>)	32	5 (16%)	11 (34%)	8 ecosystems services identified and 2 focus on tourism and recreation	Ecotourism Climbing Green tourism Game hunting Fishing and foraging Farm-based
Laguna Lake Basin, Philippines	166	5 (3%)	3 (2%)	Limited discussion of tourism but recreation mentioned on 5 pages	Ecotourism
Northern Range of Trinidad	114	35 (31%)	27 (23%)	Highlights tourism as a key issue	Ecotourism Agrotourism Hunting Fishing Water-based Wildlife watching
Portugal	54	5 (9%)	17 (31%)	3 pages on recreation discussed include tourism	Ecotourism Nature and rural Coastal Farm-based Hiking Hunting
San Pedro de Atacama, Chile	52	7 (13%)	28 (54%)	5 pages devoted to tourism and regulating tourism is 1 of 8 response options discussed	Natural attraction based Rural Community-based
Southern Africa Millennium Assessment	55	4 (7%)	18 (33%)	Stresses importance of nature-based tourism	Ecotourism Nature-based Hunting Wildlife

Switzerland	17	1 (6%)	5 (29%)	Recreation and tourism constitute 5 of the 23 ecosystem services identified	Hunting Observing wild species Natural heritage
United Kingdom.	79 synthesis report (1452 final report of assessment)	5 (6%) synthesis report 65 (4%) final report of assessment)	24 (30%) synthesis report 248 (17%) final report of assessment)	11 of 124 key findings in the synthesis report discuss tourism	Mainly habitat-based: Marine Coastal Mountain Woodland Rural

N* excludes summary opening pages (e.g. table of contents), references, annexes and glossaries

Source: authors