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Need for establishing National Observatories for the Environmental Impacts of Tourism

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Abstract

Many natural areas all over the world have been transformed into destination products with a great number of manmade facilities provided to accommodate large numbers of tourists, and to lengthen the tourist season. The tourism industry requires high energy input, and is responsible for a large part of greenhouse gas emissions. In addition, aquatic chemical and biological pollution, noise pollution, alteration of the appearance of natural ecosystems, deforestation, habitat loss, physical damages, and adverse effects on biodiversity are common negative outcomes of unsustainable tourism development. Moreover, the traditional relationship between locals and their natural surroundings undergoes constant change in favor of expanding income sources. As a result, unsustainable tourism development should be acknowledged as an "environmental health threat". Although ecotourism does offer solutions, its marketing techniques should not be used as modern "Trojan Horses" for unsustainable economic development goals. The environmental degradation attributed to tourism industry requires monitoring, mitigating policy strategies and effective interdisciplinary and interprofessional collaboration between stakeholders. National Observatories for the Environmental Impacts of Tourism should be established – especially – in countries that depend extensively on tourism such as Greece, Italy and Spain. A functioning observatory would: monitor environmental quality in tourist areas, assess the environmental vulnerability of tourist natural attractions and accomplish environmental health and social impact assessments of tourist policies. The agency could also prepare scientific reports, agendas and summaries for policy makers, summaries for the general public and take an active stakeholder role in related decision-making processes. Moreover, it could organize environmental education programs and awareness-raising campaigns for both tourists and locals. It could further develop interdisciplinary and interprofessional collaborations, within and outside the tourism sector for the promotion of sustainable tourism, the expansion of relevant scientific research and for the promotion of renewable energy use in the tourism industry.

Introduction

Since the time of the ancient Greeks Herodotus and Pausanias, who are considered as the first tourists (Smith 1914, Redfield 1985, Wenbin 2002, Bruce 2010), many geographical areas have been transformed from virginal natural landscapes or traditionally built environments to modern destination products with a great number of manmade facilities (Markwick 2000, Henderson 2005, Zhong et al. 2008, Kuvan 2010, Morrison 2013, Mao et al. 2014, Leong et al. 2017, Xue et al. 2017). Of note is the introduction of new marketing

keywords such as "place-branding" or "city-branding" that have appeared in scientific literature, depicting new, prosperous pathways of economic development (Kavaratzis 2004, Morrison 2013).

However, despite the relevant economic benefits, natural landscapes worldwide have undergone significant detrimental transformation in order to receive and accommodate more transients requiring servicing activities, which are generally associated with negative environmental impacts, and to lengthen the tourist season (Obua and Harding 1997, Markwick 2000, Zhong et al. 2008, Geneletti and Dawa 2009, Kuvan 2010, Lamb et al. 2014). For instance, new emerging environmental health hazards, such as the negative impact of cosmetic chemical products upon tropical aquatic ecosystems, have been revealed (Danovaro et al. 2008, Sharifan et al. 2016).

When a geographical area is considered as a destination product, it involves many different stakeholders such as tourism business sector, governmental sector, local communities, tourism and environmental agencies (Morrison 2013). Given the extensive dependence of tourism on the natural attractions, conservation becomes a determining factor for the maintenance of tourist flow to a given area (Stoeckl et al. 2006, Liu et al. 2007). Therefore, stakeholders should participate in transparent decision-making processes that promote sustainability and produce tourist services and products that do not degrade the natural capital (Gössling 2000, Kuvan 2010, Morrison 2013).

Ecotourism, which is promoted as a nature-based and environmentally responsible form of tourism (Wood 2002, Donohoe and Needham 2006, Conway and Cawley, 2016), does offer sustainable solutions, but there are many hidden ecological risks that must be avoided (Wood 2002, Liu 2003). For instance, when ecotourism is perceived as a marketing tool to increase tourist influx in areas already burdened by massive tourism, or to promote tourism in areas with fragile ecosystems, it may hide significant underestimated environmental risks (Obua and Harding 1997, Wood 2002, Liu 2003). Therefore, ecotourism marketing techniques should be deterred from becoming modern "Trojan Horses" for pursuing unsustainable economic development in tourism sector.

Unsustainable tourism development can be described as an emerging environmental health risk factor, and, therefore, effective political strategies should be adopted in order to avoid irreversible changes in natural ecosystems. Its negative impact on the natural environment is a sustainability issue that must be dealt with accordingly.

Energy consumption and greenhouse gas emissions

The tourism industry requires high energy input, and is responsible for a large part of global greenhouse gas emissions mainly from air travel, road transportation, and accommodation energy needs for various purposes such as heating and cooling. Moreover, there are many facilities, such as big museums and aquariums, whose operation require large amounts of energy. Additionally, the construction of the various tourist infrastructures, including the energy related to the import of necessary raw and other materials, and the construction of other relevant installations such as airports must be taken into account when measuring the total carbon footprint of tourism (Gössling 2000, Becken and Simmons 2002, Gössling et al. 2002, Gössling and Schumacher 2010, Gössling 2013, de Vita et al. 2015, Dogan et al. 2017, Zaman et al. 2016, Zhang and Gao 2016).

Boat cruises and the sum of motorized recreational activities also consume high amounts of fuel (Becken and Simmons 2002). Furthermore, food and beverage imports, storage and food production require high energy consumption (Gössling et al. 2011).

Aquatic chemical and biological pollution

Power-boating and all the motorized recreational activities are responsible for the release of chemical agents in the water, such as polycyclic aromatic hydrocarbons, which can be accumulated in the water and in the bottom sediments (Mosisch and Arthington 2001, Davenport and Davenport 2006). Another very important environmental hazard is the release of cosmetic chemical products in recreational waters. The case of some sunscreen filters that cause coral bleaching (coral death) is the most common example (Danovaro et al. 2008, Sharifan et al. 2016). The recent decision of the US state of Hawaii to ban the use of certain sunscreen products that destroy coral reefs should be highlighted (Raffa et al. 2019).

The unregulated expansion of tourism in coastal areas that lack appropriate wastewater and sewage treatment facilities may lead to unexpected chemical and biological pollution of recreational coastal waters (Lamb et al. 2014). For instance, it has been demonstrated that a common human fecal enterobacterium, known as "serratia marcescens", acts as lethal coral pathogen (Patterson et al. 2002). Moreover, the increased water consumption and the subsequent discharge of increased sewage negatively affect inland

groundwater resources (Zhong et al. 2008). An interesting fact to be mentioned here is that there are areas in which the tourism sector consumes much more water than the local general population (Charara et al. 2011).

Furthermore, agrochemicals, such as fertilizers and pesticides, used for the operation and the maintenance of sports touristic facilities that require extensive green areas, and large amount of irrigation water, constitute an important groundwater contamination concern. The case of golf tourism and golf courses is one of the most common examples (Markwick 2000).

Negative impacts on wildlife and biodiversity

The disruption of normal function, topography, hydrology and vegetation of ecosystems and reduced biodiversity are common outcomes of unsustainable tourism expansion. Much can be attributed to the construction of large touristic facilities. For instance, deforestation and its impact on the rate of soil erosion of inland and beach areas, and the consequent habitat loss of wildlife species are issues of paramount ecological importance (Abeyratne 1999, Burger 2000, Davenport and Davenport 2006, Wheeler and Nauright 2006, Yasué and Dearden 2006, Geneletti and Dawa 2009, Kuvan 2011). It is worth mentioning that, according to WWF (2003), thousands of ancient trees have been sacrificed for the construction of a single ski resort in Italy.

An important direct threat to animal life is harm to sea animals by different types of water motor craft. Serious injuries, including incidents of decapitation of sea turtles, are only one example (Davenport and Davenport 2006). Moreover, noise pollution in natural areas, such as the increased noise loads produced by road transportation, aircraft and motorboats, is another known wildlife hazard that can disturb normal animal behavior (Davenport and Davenport 2006, Barber et al. 2011, McLaughlin and Kunc 2013, Tennessen et al. 2014, Farina 2017). Wildlife can also be adversely affected by intensive animal watching activities (Davenport and Davenport 2006, Barber et al. 2011). Moreover, irresponsible wildlife phototourism, and the unacceptable trophy hunting of wild animals pose serious threats to wildlife (Dickman et al. 2018).

Furthermore, water vehicles, including small craft, can serve as vectors for the transmission of non-native fauna and flora from one aquatic environment to another (Davenport and Davenport 2006, Minchin et al. 2006). Invasive species are attached to the submerged ship surface or found in the relatively small amount of water that enters the ship for stabilization (Minchin et al. 2006).

Physical damages to ecosystems and alteration of their appearance

It is well known that the construction of tourist facilities, such as resorts and sport facilities, changes the appearance of the natural landscape (Markwick 2000, Henderson 2005, Zhong et al. 2008, Kuvan 2010, Mao et al. 2014, Leong et al. 2017, Xue et al. 2017). Likewise, certain touristic activities such as trekking, camping and off-road driving degrade soil quality and destroy low vegetation (Geneletti and Dawa 2009). Similar physical damage can occur in aquatic environments by anchors. Large anchors and their chains constitute a significant hazard for water flora (Davenport and Daveneport 2006).

Another form of physical damage is caused by the collection of "souvenirs" like shells, parts of corals, sand and stones from natural areas such as beaches and tropical coral reefs (Gössling et al. 2002, Ahamada et al. 2004, Arrivillaga and Garcia 2004, Rajasuriya et al. 2004). One notable case is the removal of pebbles from a popular beach of the Greek Island of Skiathos, which has led to an obvious degradation of the landscape's natural beauty. Local authorities have decided to impose penalties for the illegal pebble collection, and they have also placed posters and boxes for the recollection of pebbles at the airport of Skiathos (Smith 2018).

Impact on the traditional relationship between locals and natural environment

The increased number of foreign visitors has altered the traditional local identity, and relationship between indigenous populations and their natural surroundings. Mostly affected are developing countries with natural attractions. As a result, natural resources and whole natural areas, such as beaches, have been transformed into commodities that undergo unprecedented exploitation in order to produce income (Gössling 2001, Zhong et al. 2008). For instance, local families are adapting to the increased demands of tourism flow by abandoning traditional food production methods in order to produce more profitable goods, and abandoning close-to-nature work in order to offer services in tourism industry like cleaning or souvenir selling, or by acquiring new jobs. For instance, local fishermen are becoming amateur boat tourist guides in order to increase their income (Gössling 2001).

Figure 1. Folegandros Island (Cyclades, Greece): An example of a Mediterranean island that, despite tourism development, still maintains its original character.

Discussion

A National Observatory for the Environmental Impacts of Tourism (NOEIT) should be established in each country receiving high tourist influx in order to monitor environmental quality in tourist areas, and to accomplish environmental health and social impact assessments of tourist policies. Its core should be composed of a highly-educated, interdisciplinary group of scientists, whose role must exceed simple monitoring and impact assessment.

More in particular, NOEIT, except for monitoring the environmental impacts, must assess the environmental vulnerability of tourist natural attractions, and prepare scientific reports, agendas and summaries for policy makers, and annual summaries for the general public. NOEIT should also participate in decision-making processes by taking an active and crucial stakeholder role, and developing interdisciplinary and interprofessional collaborations, within and outside the tourism sector based on scientific evidence and sustainable practices.

The NOEIT should also cooperate with universities and research centers for the accomplishment of research protocols on the environmental impact in natural tourist areas as part, for instance, of doctoral theses, thereby acquiring an active role in the educational sector. In addition, new innovative methods of ecological investigation and environmental monitoring, such as sound recording applications, may be employed, further expanding modern scientific research methodology (Farina 2018). Moreover, the NOEIT should be able to offer scientific assistance to the travel and tourism industry regarding the reduction of carbon footprint and water usage, and the use of renewable energy sources.

Furthermore, it should organize environmental education programs and awareness-raising campaigns for both residents and not residents, aiming at the establishment of environmentally responsible behavior, and at the subsequent mitigation of the relevant environmental hazards. The interdisciplinary scientific group of NOEIT should also be able to propose or to make the necessary effort, amongst others, for the preservation of local identity and natural heritage, the protection of local food production methods, the promotion of local seasonal food commodities that could significantly reduce the energy needs for imports, and the promotion of renewable energy technologies.

Another effective idea could be the creation of a well-recognized logo that could be annually "awarded" to tourism businesses, including travel agencies, meet-

ing certain target environmental standards. Moreover, NOEIT could also create and maintain volunteer groups, expand their capacities and skills in environmental health issues, preparing them for dealing with emergencies in tourist areas such as oil spills that may affect coastal areas, and for participating in various restoration projects.

According to a 2019 European Parliament Fact Sheet, the environmental dimension of tourism is going to evolve into a more important parameter (Tuszyńska and Cavojsky 2018). The establishment of NOEIT – especially in countries that depend extensively on tourism, such as Greece, Italy and Spain – could be a part of a general, sustainable political strategy. The contribution of NOEIT to the sustainable development would be beneficial for both socio-economic development and environmental protection, the latter being a policy priority (European Commission 2014, 2018), which also needs to become a more crucial principle in modern tourism legislation.

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