

AicE-Bs2013London  
Asia Pacific International Conference on Environment-Behaviour Studies  
University of Westminster, London, UK, 4-6 September 2013  
*"From Research to Practice"*

## Environmental Consequences of Antarctic Tourism from a Global Perspective

Shahab Kariminia<sup>a</sup>, Sabarinah Sh. Ahmad<sup>a,\*</sup>,  
Rugayah Hashim<sup>b</sup>, Zulhabri Ismail<sup>a</sup>

<sup>a</sup>Faculty of Architecture, Planning and Surveying

<sup>b</sup>Faculty of Administrative Science and Policy Studies  
Universiti Teknologi MARA, Shah Alam 40450, Malaysia

---

### Abstract

Antarctica tourism evidently harms its ecosystem in direct and indirect ways. Ecosystems are dynamic and complex systems, which simultaneously depend on various humanity and natural factors. The nature of tourist activities continuously changes, which in turn needs improved policies and protection standards. If the varied tourism activities and the diverse consequent impacts are not adequately addressed, they would not be thoroughly considered by international treaties. This could pose unacceptable environmental risks supposedly legally safeguarded by these treaties. Hence, this study elaborated Antarctic tourism impacts in five major groups from a global perspective. The results are useful for future legislations and implementations.

© 2013 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and peer-review under responsibility of Centre for Environment-Behaviour Studies (cE-Bs), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.

*Keywords:* Antarctic tourism; environmental impact; categorization; global perspective

---

### 1. Introduction

The services provided by ecosystems play a vital role for humanity. Ecosystems support the life, supply materials and energy and absorb waste disposals (Daily, 2000). Thus, maintaining the ecosystems' integrity through appropriate protective means is important. However, ecosystems are complex and these dynamic systems are affected by various temporal and spatial factors (Kariminia, Ahmad, & Hashim,

---

\* Corresponding author. Tel.: +6-03-5544-2097; fax: +6-03-5544-2096.  
E-mail address: [sabar643@salam.uitm.edu.my](mailto:sabar643@salam.uitm.edu.my).

2012). This makes it difficult to distinguish the levels of stress these systems can endure and the limits of the replacing functions (Gössling, 2002). Meanwhile, the contribution of human activities in the environmental degradation is known. It is believed that these activities reduced the ecosystems' capacity and influenced their services, which in turn, resulted in worrying phenomena such as global warming. Recreation activities, namely tourism undoubtedly contributed to the human-environmental impacts. International treaties e.g. the UN Framework Convention on Climate Change have asked for anticipation, prevention or minimisation of the causes of global climate change and mitigation of its adverse effects (FCCC, 1992). This is more critical on remote destinations such as Antarctica that has fragile and pristine nature. The ways in which these activities impact the environment are the most important step of the related assessment and management processes. The individual influences of tourism activates on local ecosystems have caught research interest, however; due to the interaction relations, environmental degradation aspects should be studied integrally and from a global perspective. Moreover, the role of tourism on environmental stress is not limited to the physical aspect only, but extends to the intangibles such as the tourists' perceptions of the environment (Dyer, Gursoy, Sharma, & Carter, 2007; Nicoletta & Servidio, 2012).

Antarctica is almost thoroughly covered by ice, and the ice sheets supply a large part of earth's fresh water and its thermal mass contributes to the global climate (Kriwoken & Rootes, 2000). Since 1989, almost all sites, including 20 research stations have been visited in the Antarctic Peninsula region (IAATO, 2013). The Antarctic Treaty System consists of international instruments such as 1959 Antarctic Treaty; 1964 Agreed Measures for the Conservation of Antarctic Fauna and Flora; 1972 Convention on the Conservation of Antarctic Seals, 1980 Convention for the conservation of Antarctic Marine Living Resources; 1991 Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol 1991) and other special meetings that made decisions and formed measures and instruments. As the most significant instrument, Madrid Protocol 1991 contained a number of environmental protection instruments. The five annexes, namely Environmental Impact Assessment, Antarctic Fauna and Flora, Waste Disposal Management, Marine Pollution and Area Protection provided a comprehensive measure on the Antarctic region protection (Kriwoken & Rootes, 2000). Nevertheless, an increasing number of academics and parties have raised concern on the Antarctic environment degradations (Bastmeijer & Roura, 2004; Kriwoken & Rootes, 2000).

Historically, the modern era of Antarctic tourism started in the late 1950s. Between 1958 and 1987, the average number of Antarctic tourists did not exceed 1000. However, in a period between 1993 and 1994, this population unprecedentedly exceeded the number of scientists who travelled to this area (Bastmeijer & Roura, 2004). Despite the limited growth or even gentle decline of visitor pollution in some parts of Antarctic tourism industry, there were close to 35000 visitors in 2012-2013 season; an increase from almost 26000 in 2011-2012 (IAATO, 2013). The increase of passengers on small- and medium-sized vessels and travellers who preferred to experience cruise-only adventure is believed to be the reasons of this jump.

This paper aspires to comprehensively address the environmental impacts of Antarctic tourism on ecosystems from both local and global, and physical and psychological perspectives. In addition, it aims to estimate the scale of these impacts and theoretically assess the role of each for the environmental sustainability. Hence, the Antarctic environmental changes, in both local and global, are firstly reviewed. In the next step, the study concentrated on impacts to which tourism contributes. Both laboratory and field studies were reviewed in these stages. Some parts of the data were presented by previous studies and some parts were reported for other environmental situations or non-systematically explained. The further review, comparison and evaluation shed light on the most critical aspects of the impacts which should be noted in forming the new international treaties.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات