Remaking Tourism Carrying Capacity Frameworks for Geoparks

Wei Guo¹,², Shanshan Chung²

Abstract

The concept of geopark was first officially proposed by UNESCO in 1999. Since then, there is an increasing interest in how the management purpose of geoparks can be fulfilled. However, no tailor-made management framework for geoparks is available so far. Six existing tourism carrying capacity (TCC) frameworks for national parks, i.e. Recreation Opportunity Spectrum (ROS), Limits of Acceptable Change (LAC), Visitor Impact Management (VIM), Visitor Experience and Resource Protection (VERP), Visitor Activity Management Process (VAMP), and Tourism Optimization Management Model (TOMM) are reviewed. It is found that they are all developed to manage national parks in an environmentally sustainable way, but they commonly failed to equally address the interests of all stakeholders which makes the direct application of these framework in geoparks inappropriate. The concept of tourism carrying capacity provides benefits in terms of raising awareness on sustainable tourism in national parks and the six traditional tourism carrying capacity frameworks are imperative to be modified for use in geoparks. Therefore we proposed a modified tourism carrying capacity concept for use in geoparks and remodeled existing tourism carrying capacity frameworks for the sustainable tourism management in geoparks.

Keywords: Carrying capacity, tourism carrying capacity framework, geopark, national park

1. Introduction

TCC concept was promoted to safeguard the quality of natural resources and/or visitor experience in national parks during the 1960s and 70s (Manning, 2007). Employed in national parks, TCC was first defined as the maximum number of visitors (UNWTO, 1981) and then as “the level of visitor use” (WTO/UNEP, 1992). Six TCC frameworks emerged in the late nineteenth century as the universal park management strategies, namely, Recreation Opportunity Spectrum (ROS) (Clark & Stankey, 1979), Limits of Acceptable Change (LAC) (Stankey et al., 1985), Visitor Impact Management (VIM) (Graefe, Kuss & Vaske, 1990), Visitor Experience and Resource Protection (VERP) (NPS, 1993), Visitor Activity

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The geopark concept was firstly officially released until 1999 by Global Geopark Network (GGN). GGN formulates three goals in the development of geopark, they are conservation of the geological heritages, education of geoscientific knowledge to the public, and sustainability on promoting local economy (GGN, 2010). Until now, there are 111 global geoparks in 32 member states (GGN, 2016). While there is no lack of studies on the impacts of tourism in geoparks, little has been done to device a universal sustainable geopark management strategy.

2. Literature Review

The most cited definition of carrying capacity for use in national park stakes it to mean a maximum number of tourists. However widespread disenchantment of the carrying capacity concept occurs after 1992 when WTO/UNEP re-released the definition for carrying capacity as “the level of visitor use an area can accommodate with high levels of satisfaction for visitors and few impacts on resources”. The emphasis is then shifted from limiting visitor numbers to limiting use within national parks.

Figure 1 shows the timeline of TCC frameworks application in national parks. The expansion of TCC from wildlife ecology to environmental management and the historical lineage of carrying capacity to national park management as a universal sustainable management strategy can be traced back to Hardin’s publication of “The Tragedy of the Commons” in Science. In the same year, the notion of TCC was addressed in the US Wild and Scenic Rivers Act and amendments to the US National Trail System Act. The addressing of TCC concept and the subsequent U.S. national park centennial anniversary in 1972 provokes an extensive scientific and professional discussion on the connection between visitors’ use and parks’ value. The concept is later mentioned in the National Outdoor Recreation Plan of 1973 and the US National Forest Management Act of 1976. Consequently, a General Management Plan (GMP) is required for all parks in U.S. in accordance with the General Authorities Act of 1978 (U.S. Public Law 95-625). It is stipulated that all parks of the National Park System in U.S. have to identify and include implementation commitments for visitor carrying capacities for all areas in the park in GMP.
Soon afterwards, ROS is built up to meet Hardin’s emphasis on park values to visitors. The major purposes are allocating and managing recreational opportunities for park visitors (Clark & Stankey, 1979). Then, in 1981, the United Nations World Tourism Organisation released the official definition for carrying capacity as the maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors’ satisfaction. Later on, based on this definition and Hardin’s emphasis on limited park resource, LAC is established to deal with the dilemma between the visitor use and the supporting park environment (Stankey et al., 1985). Then, VIM is developed to address issues associated with visitation-related impacts (Graefe et al., 1990) and VAMP is designed to provide guidance for new and established parks (Environment Canada and Park Service, 1991).

Among these four frameworks, i.e. ROS, LAC, VIM, and VAMP, ROS, LAC, and VIM are issue-driven. The processes are triggered by issues, such as crowding and trampling. But the issue-driven framework is less able to achieve the ultimate goal for park management. Thus, a goal-driven framework called VERP was introduced to help park managers making sound decisions on visitor use in order to get desired future condition in national parks in U.S. (NPS, 1993). Later on, TOMM was built up in Australia to pursue sustainable tourism, rather than just focusing on certain issues, such as trampling and crowding (UTOK, 2000).

Each framework has its own process to evaluate TCC in national parks. The important components common to all the six frameworks include: 1) identification of management

Figure 1. Tourism carrying capacity timeline in park management.
objectives; 2) evaluation of carrying capacity; and 3) application of management practice to monitor sustainable tourism.

On the whole, when the concept of TCC is used in sustainable tourism in terms of managing negative impacts on national parks while protecting the physical environment, it is cited as a framework (Lindberg et al., 1997), being a subjective management notion, rather than aiming at the calculation of an objective number (Stankey, 1979).

3. Discussion

It is necessary to elucidate how TCC should be applied in geopark before going on. There is still no common consensus as to how TCC should be defined (Simón, Narangajavan & Marqués, 2004). The WTO/UNEP (1992) proposed TCC concept for park management is most widely used, as “the level of visitor use an area can accommodate with high levels of satisfaction for visitors and few impacts on resources”. Geopark is defined as “the geographical areas where geological heritage is the focus of local protection, education and development” (GGN, 2014). When the concept of TCC is applied in geoparks, we believe it should illustrate a delicate compromise between environmental protection, public education and local economic development. Thus, we suggest TCC for geopark should better be described as the situation or condition of a global geopark where environmental conservation, scientific education, and regional economic sustainability can all be achieved (Guo & Chung, 2015).

The discussion on modifying existing TCC frameworks for geoparks cannot be continued unless the differences between national parks and geoparks are clearly elucidated. Geopark and national park both are parks in natural resource areas. The major distinction between the management principles of national park and geopark is that national park more highlights the conservation and protection of the physical environment whilst geopark considers conservation, as well as education and economic development in its area (Table 1).

Table 1. Difference between National Park and Geopark.

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<tr>
<th>Difference</th>
<th>National Park</th>
<th>Geopark</th>
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<tr>
<td>Definition</td>
<td>Large areas of public land set aside for native plants, animals and the places in which they live.</td>
<td>Geographical area where geological heritage sites are part of a holistic concept of protection, education and sustainable development.</td>
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<tr>
<td>Purpose</td>
<td>Protect places of natural beauty, places important to aboriginal people, and places that show how people lived in the past.</td>
<td>Explore, develop and celebrate the links between that geological heritage and all other aspects of the area’s natural, cultural and intangible heritages.</td>
</tr>
<tr>
<td>Management Principles</td>
<td>Safeguard human life and property, promote the conservation of biodiversity, and protect aboriginal sites and historic assets.</td>
<td>Conservation of the geological heritages, education of geoscientific knowledge to the public, and sustainability on promoting local economy through geotourism</td>
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The failure to develop “the links between that geological heritage and all other aspects of the area’s natural, cultural and intangible heritages” will cause the less effective conservation in geoparks. A key point of applying modified TCC framework successfully in geoparks is the understanding of the “aspects” and the “links”. The term of “stakeholder” is used to represent the “aspects” in geoparks because different stakeholders have different interests and their interests are related to all aspects, such as geological heritage preservation, nature conservation, cultural protection, and economic development. Three dimensions of TCC, namely, physical-ecological carrying capacity, socio-demographic carrying capacity, and political-economic carrying capacity (UNEP/MAP/PAP, 1997), are employed to symbolize the “links” of all stakeholders in geoparks.

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Looking back on the six traditional TCC frameworks, TOMM has started to consider the economic benefit for local people and the stakeholder relationships for sustainable tourism development. Although the other five frameworks do not clearly indicate the significance of stakeholders, they are all built to facilitate “links” between environment and visitors. In short, while stakeholders and their inter-relationships are mentioned in existing TCC frameworks some stakeholder groups are missed.

Stakeholder is “any group or individual who can affect or is affected by the achievement of the organization’s objectives” (Freeman, 1984: 46). A positive relationship between people, resources and tourism is very unlikely to occur without implementation of effective management strategies and involvement of a wide range of stakeholders. Based on the experience of six conventional TCC frameworks and the differences between national parks and geoparks, an example of the schematic illustration of the interconnected relationship between the primary stakeholders for use in geoparks, is illustrated in Figure 2.
To amend the six traditional frameworks when applying them in geoparks, we propose the modified framework (Figure 3). In the review/initializing phase, the primary stakeholders of geoparks and their interests are explored before the management objectives are defined, so as to develop and conserve geoparks to meet all stakeholders' interests. In the TCC evaluation phase, the three dimensions of TCC, namely, physical-ecological carrying capacity, political-economic carrying capacity, and socio-demographic carrying capacity are assessed by all primary stakeholders. Finally, an action plan is suggested after the SWOT analysis based on the evaluation results.
Figure 3. Modified TCC framework for use in geoparks.

The proposed framework is developed to address the changes being ushered by tourism in geoparks as a unified managerial strategic direction. It is meant to be a cyclical process because the environment itself is changing imperceptibly and the stakeholders’ interests may change over time, which require major readjustment by the management organization. If the proposed TCC framework is applied, stakeholders’ interests should be retained and be continuously reviewed in the cyclical procedure. There is no easy answer to the fundamental conflicts between different stakeholders. Solutions must be worked out in the combined long-term crucibles of negotiation and adaptive management. By doing so, the purpose of our proposed TCC framework is to make all stakeholders work collaboratively toward the unified goals, i.e. high levels of satisfaction for visitors and residents, as well as few impacts on resources in geoparks.

4. Conclusion

Being first appeared in UNESCO Geoparks Programme in 1997, the concept of global geopark is new in sustainable tourism and emerged as a novel branding strategy to promote the tourism destination (GGN, 2014). For developing sustainable tourism in geoparks, we
suggest the concept of carrying capacity to be rejuvenated as the signal of systemic balance between physical-ecological carrying capacity, socio-demographic carrying capacity, and political-economic carrying capacity (Guo & Chung, 2014).

Previous TCC frameworks suggest that TCC is the thermometer of sustainable national park management. However, they commonly failed to address the interests of all stakeholders of national parks. Sustainable tourism however cannot be achieved without regarding all stakeholders’ interests (Ioannides, 1995). Based on the review of the six well-known TCC frameworks for national parks, and the difference between national parks and geoparks, our proposed cyclical framework aims at pursuing the optimal “links” between all “aspects” in geoparks, as well as in national parks, which are managed in an environmentally, sociologically, and economically sustainable way.

References