

## DOCTORAL THESIS

### Building a tourism carrying capacity framework for global geoparks

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## ABSTRACT

The concept of geopark was first proposed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1999. After that, geotourism emerged as a novel strategy for sustainable development in rural areas. Tourism carrying capacity is a concept related to the optimum use of natural areas without creating environmental degradation. This concept has been widely employed in nature tourism in national parks.

To apply the carrying capacity concept in global geoparks, the purpose of this study is to remodel existing tourism carrying capacity frameworks to foster sustainable use of global geoparks. A review of the development of carrying capacity concept and six tourism carrying capacity frameworks, namely, 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) in Chapter 2 demonstrates that tourism carrying capacity concept is able to raise the awareness on sustainable tourism in national parks but these traditional tourism carrying capacity frameworks commonly failed to address the interests of all stakeholders. Thus, this thesis adopts the definition of tourism carrying capacity for geoparks as *the situation or condition of a geopark where there is reconciliation (i.e., having balance and harmony) of environmental conservation, social maintenance, and economic development.*

Based on the three aspects (i.e., environmental conservation, social maintenance, and economic development) of this concept, a tailor-made framework for global geoparks was built in Chapter 3, using confirmatory factor analysis and the revised importance-performance analysis to evaluate tourism carrying capacity in Global Geoparks. Then the modified tourism carrying capacity framework was applied in two UNESCO Global Geoparks, namely, Hong Kong Global Geopark and Danxiashan Global Geopark, to address the inherent tensions between resources conservation and sustainable

development in both Geoparks in Chapters 4 and 5. It was found that 1) there was compatibility only among the three dimensions, namely, environmental conservation, social maintenance, and economic development in two Geoparks; 2) the structure of the framework and the compatibility of the three dimensions can only be confirmed in the local community model (Figure 3.3) by the importance data of factors, i.e., resource, human environment, and facility. No validity can be established in the construct of the GGN model on the local community's satisfaction of the overall environments in two Parks and neither is there an agreement between the visitors in both Parks with the GGN criteria; and 3) from the satisfaction data on the three factors of the visitor model (Figure 3.4), i.e., environmental carrying capacity, political-economic carrying capacity, and socio-demographic carrying capacity, it shows that HKGP appears to be more sustainably managed than DXSGP. Collectively, this study has provided a new framework for evaluating tourism carrying capacity in a geopark. I hope to advance the methodological innovation of sustainable geotourism management and supplement the lacuna of criteria and standards for Global Geoparks in future studies.

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