Estimating Effects of Tourism using Multiple Data Sources: The Miranda Tool as Part of a Spatial Decision Support System for sustainable destination development

Tobias Heldt*, Omar Alnyme* and Daniel Brandt*

*Centre for Tourism and Leisure Research, Dalarna University

Abstract prepared for the GSTC Academic symposium - at the GSTC Global Conference SWEDEN APRIL 23, 2024

Abstract

Planning for sustainable mobility and destination development in rural areas is increasingly important when tourism grows in numbers. A key to address the challenge of transformation and adaptation of local communities to mitigate adverse effects in seasonal peak hours like traffic congestion, power failure, waste management and sewage flooding, is to properly estimate the number of visitors to a destination.

The problem of estimating tourism numbers is a known challenge since, for example, guest nights statistics are incomplete and non-commercial lodging (sharing solutions) are increasing. Recently, the promising utilization of mobile phone data has emerged as a means to estimate tourism volumes. Additionally, sewage data and speed camera records stand out as two alternative data sources capable of indicating tourism activity.

This paper aims to introduce the Miranda-tool and its associated methodology, which together enhance the accuracy of estimating tourism volumes and their economic impacts through the use of the newly developed GIS-based DUGIS-platform. The Miranda-tool embodies both a technical GIS platform that brings together diverse data sources to estimate and present the economic effects of tourism and a procedural methodology guiding the collection of data sources and necessary stakeholder collaboration within the tourism planning framework.

Using Sweden's No1 winter tourism destination as a case study, this paper illustrates the Miranda-tool's potential as a Spatial Decision Support System for both sustainable tourism and transport infrastructure planning. In conclusion, the Miranda tool holds potential for enhancing the comprehension of tourism volumes and their associated impacts, particularly in early-stage strategic planning processes.

Keywords: Miranda Tool, Sustainable tourism, transport planning, strategic planning processes, Spatial Decision Support System, DUGIS platform