Creating a GIS-Base for an Informed Analysis of Tourism Development: A Socio-Economic Perspective

Adrijana Car, Marike Bontenbal and Marius Herrmann
adrijana.car@gutech.edu.om

GSS 2012

Affiliated to: RWTH Aachen University
Contacts

Dr. Adrijana Car
Associate Professor in GIS
adrijana.car@gutech.edu.om

Dr. Marike Bontenbal
Assistant Professor in Human Geography and Urban and Regional Planning
marike.bontenbal@gutech.edu.om

Marius Herrmann
Intern in GIS
marius.herrmann@gutech.edu.om

Department of Sustainable Tourism and Regional Development
German University of Technology in Oman (GUtech)
www.gutech.edu.om
Motivation

- **Ongoing multidisciplinary research project on tourism and community participation in Oman**
  - Tourism, Economics, Regional Development, Anthropology, Geography and GIScience

- Creating a **common framework of thinking**: geographical space

- GIS can bring significant added value to decision making through data analysis, modelling and forecasting (e.g. McAdam 1999)

Picture: [http://blogs.scientificamerican.com/observations/files/2012/05/social_network_brain.jpg](http://blogs.scientificamerican.com/observations/files/2012/05/social_network_brain.jpg)
Contents

• Tourism Aspect
  – Tourism Products
  – Tourism Typologies

• Conceptualization – bringing together research in Tourism and GIScience

• GIS Aspect
  – Geo-Base Creation
  – Data Modelling

• Summary and Further Steps

Tourism Aspects

Tourism is a complex phenomenon:

• An *industry* with a diverse range of sectors and actors

• A *human activity* causing a myriad of socio-economic, cultural and environmental effects

• A *tourism product* than can be supplied and consumed

• Is *spatial in nature*
The Tourism Product

Model components:

**PP**: Physical Plant (site)
**S**: Service
**H**: Hospitality
**FC**: Freedom of Choice
**I**: Involvement

(Smith 1994, Fig. 1, p.587)
The Five A’s of tourism

- Attractions
- Access
- Accommodation
- Amenities
- Awareness

(Tourism Western Australia 2009)

The Six A’s of tourism

- Attractions
- Accessibility
- Amenities
- Ancillary services
- Available packages
- Activities

(Buhalis 2000)
Typology

- A way of classifying things of interest according to some criteria (http://www.britannica.com/search?query=typology)
- Helps organizing domain knowledge
- Tourism research typologies are frequently used to establish a framework of thinking about an issue or problem in scientific manner (Coccossis and Constantoglou 2006)
Tourism Typologies - Approach

Top down
based on existing literature

Tourism typology

Bottom up
based on case studies
Use of Typologies

- The use of typologies has been common in tourism studies to *conceptualize tourism phenomena*
  - Useful tool for tourism development planning and policy making

**Tourism supply typologies – examples of criteria**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>the localised or extensive nature of the tourist destination area</td>
<td></td>
</tr>
<tr>
<td>the rate of development</td>
<td></td>
</tr>
<tr>
<td>the nature of development (spontaneous versus planned)</td>
<td></td>
</tr>
<tr>
<td>the characteristics, attitudes and influence of the existing population</td>
<td></td>
</tr>
<tr>
<td>the extent of public and private sector involvement in tourism</td>
<td></td>
</tr>
<tr>
<td>the economic base prior to tourism growth</td>
<td></td>
</tr>
<tr>
<td>the offer of tourism services</td>
<td></td>
</tr>
</tbody>
</table>

*(Coccossis and Constantoglou 2005; 2006)*
Tourism Supply Typology

- Despite being a key sector of economic growth and diversification, tourism in Oman has remained understudied

![Table](image)
Using a *tourism supply typology* is expected to prove useful in describing and analysing the nature of tourism products in Oman:

- Proposing a framework of tourism product criteria
- Categorising tourism attractions, actors, activities and environments into meaningful types
- Policy relevance
  - for tourism planning and regulation
  - for the application of GIS in tourism planning
Tourism Supply Typology (cont.)

The following criteria are proposed to help assess tourism in Oman into a supply typology:

1. Tourism growth
   • phase, level, and qualitative characteristics

2. Tourism governance
   • existence or absence of development planning in the destination area and stakeholders involved

3. The characteristics and response of the local community
   • demographic terms, existing economic activities, and human resource potential

4. The quantitative and qualitative nature of tourists
   • demographic and socio-economic characteristics
• Sharing of computerized data and results and in turn improved communication in the multidisciplinary project team
• Formal description of the underlying spatial concepts, e.g. using ontologies (Gruber 1993)
• Comparison with similar concepts / approaches
GIS in Tourism Research

• Literature review on GIS-related conceptualization in tourism:
  – Developing a multimedia database for tourism in Nigeria
    (Ayeni et al. 2004)
  – Urban growth impact in tourism area using remote sensing and GIS in the UAE
    (Bualhamam 2009)
  – Using GIS and PPGIS in community planning
“All GIS-related activities serve this final purpose - to communicate; all other functions, such as data storage, management analysis and so on, are intermediate steps serving primarily as means to communicative ends.”

(Sui and Goodchild 2003, p.7)
GIS in Tourism Research

GIS as a communication tool
• first create a comprehensive geographical database
• identify tools appropriate for spatio-temporal analysis and visualization

[http://img3.kozzi.com/m1/12/223/2476981624769816a113738_k0058_mapday4_final_k0030.jpg](http://img3.kozzi.com/m1/12/223/2476981624769816a113738_k0058_mapday4_final_k0030.jpg)
An Informed Analysis

• ...is a combination of spatial analysis in GIS together with quantitative and qualitative analysis in tourism research

The basis for informed spatial decision making
### GIS in Tourism Research (cont.)

<table>
<thead>
<tr>
<th>Selected functional capabilities of a GIS</th>
<th>Examples of basic questions that can be investigated using a GIS</th>
<th>Examples of tourism applications &amp; corresponding specific tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data entry, storage and manipulation</strong></td>
<td>Location: Where is…?</td>
<td>Collecting spatial data</td>
</tr>
<tr>
<td></td>
<td><strong>Attributes</strong>: What, when and how is…?</td>
<td>Integrating (non-)spatial data</td>
</tr>
<tr>
<td></td>
<td>Data retrieval: Select… from… where…?</td>
<td>Tourism Management</td>
</tr>
<tr>
<td></td>
<td><strong>Pattern</strong>: What is the spatial distribution of…?</td>
<td>Analysing relationships associations with resource use</td>
</tr>
<tr>
<td></td>
<td><strong>Modelling</strong>: What if…?</td>
<td>Assessing potential impacts of tourism development</td>
</tr>
<tr>
<td></td>
<td><strong>Visualization</strong>: all the above</td>
<td>Creating maps</td>
</tr>
</tbody>
</table>

- **Tourism Resource Inventories**: Creating a geographic base for a tourism product
- **Tourism Management**: Deriving spatial extent and demographic characteristics of the local community
- **Tourism Growth Analysis**: Monitoring spatial distribution and time series analysis
- **Assessing Phase and Level of Tourism Development**: Assessing phase and level of tourism growth
- **Mapping Results**: Mapping results of a tourism location suitability analysis
Geo-Base Creation

Spatial database for Analysis and Visualization of Tourism in Oman

Tourism-specific Features in a Tourism Database
- Tourism products

Geographic Features in a Base Map Database
- Topography
  - Physical Landscape
  - Infrastructure
  - Administrative Units
  - Parcels
  - …
Geo-Base Creation: Conceptual Model
Geo-Base Creation: Base Map Data
Geo-Base Creation: Tourism Data
Further Steps

• Short-term results
  – Create and populate a geodatabase for tourism in Oman based on the described concepts and models
  – Create a metadatabase of all datasets
  – Use the created geodatabase in tourism research and teaching

• Mid-/Long-term results
  – Revise \textit{the typology} based on the experience from the case studies
  – Derive \textit{an ontology} for a tourism product
Summary

• One possible scenario to illustrate the potential of using GIS in tourism research
• Set foundations for a common conceptual framework based on a tourism supply typology for the specific context of Oman
• This is an important precondition that allows researchers to communicate, compare and share spatial /non-spatial data and research results in a multidisciplinary project environment

Dr. Adrijana Car
adrijana.car@gutech.edu.om

Marius Herrmann
marius.herrmann@gutech.edu.om

11/12/2012
Geospatial Scientific Summit
References