A Comparison of the Trait of Tourist flows before and after Natural Disaster - case of the tourist flow to Jiuzhaigou before and after 8.0 Ms Wenchuan Earthquake, China

ZHANG J, LI M & ZHANG HL
Nanjing University, P.R. of China

Introduction - Studies on disasters’ effects on tourism


So studies on natural disasters’ effects on tourism can be classified into two categories:

- Negative vs Positive
- Visible VS Invisible

This study: from the perspective of spatial structure, attitude and evaluation of tourist

- Changes in spatial structure of the tourist origin before and after the natural disaster – with index of market share
- Comparing tourists’ attitudes or perception to the effects of disaster on tourism and destination
Study aim

- To reveal certain traits of tourist flow related to disaster
  - Spatial structure of market share
  - Attitude and perception of disaster on tourism
- To provide scientific basis for crisis management
  - Try to provide a useful reference for the recovery and revitalization of tourism in a strategic way under similar circumstances in the future

2. Data collection and methodology

Study area and its location

Study area: Jiuzhaigou National Park

- World Natural Heritage Sites enrolled by UNESCO
- National Geological Park and National Conservation
- The site identified by Green Globe 21 Program
- World Biosphere Reserves in Man and Biosphere Program (MAB).

Attractions:

- Numerous waterfalls (3 mains) and Colorful lakes (>100)
- Primitive forests and Wildlife – giant panda?

Geomorphic location:

- Easter edge of Tibet-Qinghai plateau with complex and active geologic structure movement

Geographic position:

- Latitude: 32.54 ~ 33.16 (N)
- Longditude: 103.46 ~ 104.3 (E)

- Basin area: 641.35 km²
- Valley length
  - Y shaped 3 sightseeing valleys with 17, 14, 21 km
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Year

0 50 100 150 200 250 300

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South China University of Technology

Shanghai Jiao Tong University
2. Methodology

- Measuring the tourist attitude to disaster’s impact on tourist destination

<table>
<thead>
<tr>
<th>ITEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>extensive damage</td>
</tr>
<tr>
<td>inconvenient transportation</td>
</tr>
<tr>
<td>decrease in the number of tourists</td>
</tr>
<tr>
<td>destruction of tourism resources</td>
</tr>
<tr>
<td>long recovery time</td>
</tr>
<tr>
<td>weakening of the environment</td>
</tr>
<tr>
<td>trip becoming dangerous</td>
</tr>
<tr>
<td>less fun</td>
</tr>
</tbody>
</table>

2.3 Analysis

- Analyzing the distribution of tourists with unit of origins referring to long tail market share
- Comparing the changes in the market share occupied by various provinces (autonomous regions and municipalities included) before and after the earthquake.
- Examining the significant differences in eight items of tourists’ attitudes to (or perception of) the effects of disaster on the destination.

### Tab.1 Distribution of sample

<table>
<thead>
<tr>
<th>survey time</th>
<th>samples about tourist origin</th>
<th>samples about tourist attitude to disaster impact on tourist destination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>province</td>
<td>county(city)</td>
</tr>
<tr>
<td>April 27th- May 5th in 2008</td>
<td>2400</td>
<td>2225</td>
</tr>
<tr>
<td>May 5th to 10th in 2009</td>
<td>2400</td>
<td>2099</td>
</tr>
<tr>
<td>August 8th to 14th in 2011</td>
<td>2200</td>
<td>——</td>
</tr>
</tbody>
</table>

D-number were distributed, N-efficient number, R-effective rate
3 Results and discussions

• Changes in spatial structure of Jiuzhaigou’s markets before and after the Earthquake
  △ Changes in the long tail of the distribution of travelers before and after the earthquake

Fig. 1: Market analysis of Jiuzhaigou before and after the earthquake

Fig. 2: The Distribution of the Long Tail Market in Jiuzhaigou before and after the Earthquake

• Changes in the domestic tourist market share before and after the earthquake
Fig. 3 Fluctuations of market share of Jiuzhaigou’s domestic tourist origins before and after the earthquake

Fig. 4 Spatial distribution of market share of Jiuzhaigou’s domestic tourist origins

Discussion on the result of spatial structure

Different long tail distributions and market shares

Possible cause - interpretations

Long tail effects with result from e-commerce
  - Development of the e-commerce of tourism
  - Without earthquake this should be most reasonable interpretation with most academic implication

Stronger psychological effect of disaster on potential tourists of nearer origins result in the decrease of market share of neighboring origins

Distance decay of disaster effects on tourist?

Different Travel behavior: Transportation mode
Comparison of tourists’ attitude or perception towards the disaster’s impact on the destination

In general

With geographical segmentations
- Sichuan and neighboring provinces
- Mid-western provinces
- Eastern coastal developed provinces

3.3 Differences in groups of tourists’ perception

Tab. 3 ANOVA for comparison of tourist attitude to disaster impact on tourist destination by tourist origin groups

<table>
<thead>
<tr>
<th>Factors</th>
<th>n</th>
<th>Mean</th>
<th>Std</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>extensive damage</td>
<td>534</td>
<td>2.85</td>
<td>1.247</td>
<td>6.397</td>
<td>.012</td>
</tr>
<tr>
<td>inconvenient transportation</td>
<td>538</td>
<td>2.60</td>
<td>1.282</td>
<td>6.123</td>
<td>.014</td>
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<tr>
<td>decrease in the number of tourists</td>
<td>539</td>
<td>2.52</td>
<td>1.192</td>
<td>8.869</td>
<td>.003</td>
</tr>
<tr>
<td>destruction of tourism resources</td>
<td>542</td>
<td>2.32</td>
<td>1.151</td>
<td>.862</td>
<td>.487</td>
</tr>
<tr>
<td>long recovery time</td>
<td>535</td>
<td>2.31</td>
<td>1.136</td>
<td>1.252</td>
<td>.288</td>
</tr>
<tr>
<td>weakening of the environment</td>
<td>544</td>
<td>2.21</td>
<td>1.035</td>
<td>1.087</td>
<td>.362</td>
</tr>
<tr>
<td>trip becoming dangerous</td>
<td>533</td>
<td>2.14</td>
<td>1.022</td>
<td>.298</td>
<td>.879</td>
</tr>
<tr>
<td>less fun</td>
<td>540</td>
<td>1.84</td>
<td>.898</td>
<td>4.829</td>
<td>.028</td>
</tr>
</tbody>
</table>

1- Sichuan Province; 2- neighboring provinces, 3- Mid-western region (increased) 4- Mid-western region (with a decrease trend) 5- the eastern region; a and b indicate the source of different significant levels.

Result:
Tourists from different origin cities have quite different attitudes towards the items of “inconvenience of transportation, a heavy blow, reduction in the number of tourists and less fun”.

Tourists from Sichuan Province score highest in these four items while tourists from eastern region score lowest in “inconvenience of transportation and less fun”.
4. Conclusions and implication

1) Earthquake caused significant changes in the market share of the tourist origins in and near the disaster-hit area declined. Of the remote origins (mainly eastern China) increased.

2) Tourists of different origins have different attitude of inconvenience of transportation, number of potential tourists, the fun of traveling. Tourist from developed region with optimistic view.

Implication:

- Transport might directly or indirectly influence tourists’ perception of transportation reconstruction or substitution very important.
- Longtail theory and e-commerce in tourism marketing.
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