A comprehensive approach to MST piloting: The Tourism Sustainability Satellite Account

Johanna Schulze Düding (DIW Econ)
Madrid, December 14, 2022
Introduction & background

- The German Environment Agency commissioned a consortium consisting of DIW Econ among others to develop a national sustainability measurement system for German tourism.
- The result was the first TSSA for Germany.
- TSSA stands for Tourism Sustainability Satellite Account.
- It is based on methodology of Tourism Satellite Account (TSA) and is consistent with national accounts and the system of environmental-economic accounting (SEEA).
- First TSSA for Germany was developed with reference year 2016/2015.
Economic and environmental indicators

- **Economic indicators**
  - Gross value added (GVA; in euros)
  - Number of employees
  - Labor productivity (defined as the ratio of gross value added to labor force, i.e. number of employees)

- **Ecological/environmental indicators**
  - Greenhouse gas (GHG) emissions (in tons CO$_2$-eq); measured in absolute terms in relation to GVA (“GHG emission intensity”)
  - CO$_2$ emissions contained in tourism-related products (in tons); measured in absolute terms
  - Water use (in cubic metres); measured in absolute terms in and in relation to GVA (“water use intensity”)
  - Energy use (in Terajoule); measured in absolute terms and in relation to GVA (“energy use intensity”)
  - Polluting emissions (in tons); measured in absolute terms and in relation to GVA (“polluting emission intensity”); differentiated by Nitrogen oxide (NO$_x$) emissions and particulates emissions (PM10 & PM2.5)
Social and management indicators

- **Social indicators**
  - *Index for quality of labor conditions* (based on survey data from German Trade Union Federation)
  - *Gender Pay Gap (unadjusted)*
  - *Low wage quota*
  - *Share of employment relations with overlong working hours in total employment relations*
  - *Share of employees with involuntary fixed-term work contract in total employment relations*
  - *Share of employees with adequate qualifications in total employees*
  - *Share of households in Germany that can at least finance a one-week vacation trip per year*
  - *Average gross wage* (in euros): measured in absolute terms per employee

- **Management indicators**
  - *Number of officially certificated sustainability destinations in Germany*
  - *Share in number of touristic arrivals/departures with eco-friendly means of transport* (i.e. public transport by bus and train)
TSA background and methodology in Germany

TSA calculation approach:

• **Follows internationally accepted guidelines and standards of TSA framework** (compilation of TSA tables 1-2 & 4-7, classification of tourism-characteristic products, official definition of tourism/visitors etc.)

• **Outcome:**
  - Direct and indirect gross value added effects
  - Direct and indirect employment effects of the tourism industry
  - **Tourism ratios and tourism shares**
TSSA basis: Tourism ratios and tourism shares by tourism industry

**Tourism ratio**: share in total gross value added of a specific economic sector that is related to tourism expenditures in Germany

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Tourism Ratio (in percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall tourism industry</td>
<td>4.0</td>
</tr>
<tr>
<td>Other economic sectors</td>
<td>1.6</td>
</tr>
<tr>
<td>Arts, entertainment and recreation (90-93)</td>
<td>8.1</td>
</tr>
<tr>
<td>Travel agency and tour operator (79)</td>
<td>18.2</td>
</tr>
<tr>
<td>Rental and leasing activities (77)</td>
<td>4.0</td>
</tr>
<tr>
<td>Accommodation and gastronomy (55-56)</td>
<td>63.1</td>
</tr>
<tr>
<td>Air transport (51)</td>
<td>80.7</td>
</tr>
<tr>
<td>Water transport (50)</td>
<td>93.7</td>
</tr>
<tr>
<td>Land transport (49)</td>
<td>93.7</td>
</tr>
</tbody>
</table>

**Tourism ratio (in percent) by tourism industry in 2019**
(Official number of NACE economic sector in brackets)

**Data basis**: Own calculation based on TSA Germany / Destatis (2021)
TSSA basis: Tourism ratios and tourism shares by tourism industry

Tourism share: the sector-specific share of tourism-induced gross value added in total tourism industry

Tourism share (in percent) by tourism industry in 2019
(Official number of NACE economic sector in brackets)

Data basis: Own calculation based on TSA Germany / Destatis (2021)
**Calculation example: Linking SEEA and TSA**

**Tourism-induced GHG emissions in the Accommodation and gastronomy sector**

<table>
<thead>
<tr>
<th>SSEA</th>
<th>TSA</th>
<th>TSSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG emissions ((in tons CO$_2$-eq) in the Accommodation and gastronomy sector</td>
<td>Tourism ratio of Accommodation and gastronomy in percent</td>
<td>Share of tourism related GHG emissions in the Accommodation and gastronomy sector</td>
</tr>
<tr>
<td>3,270 tons CO$_2$-eq *</td>
<td>80.7 %</td>
<td>= 2,639 tons CO$_2$-eq</td>
</tr>
</tbody>
</table>
GHG emissions of the German tourism industry

**GHG emissions by touristic sectors (in 1,000 tons CO₂-eq); 2015 vs. 2019**
(Official number of NACE economic sector in brackets)

**Tourism induced GHG emissions (in 1,000 tons CO₂-eq); 2015 vs. 2019**
(Official number of NACE economic sector in brackets)

Data basis: Own calculation based on national accounts/air emission accounts (Destatis); TSA Germany (DIW Econ et al. 2017 / TSA Destatis 2021)
## Calculation example: Linking TSA and Social Indicators

### Gender Pay Gap in the Air transport sector

<table>
<thead>
<tr>
<th>Social Indicator</th>
<th>TSA</th>
<th>TSSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender Pay Gap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference between the average earnings of men and women in the Air transport sector in percent</td>
<td>51.0 %</td>
<td></td>
</tr>
<tr>
<td>Tourism share of Air transport sector in percent</td>
<td>*</td>
<td>3.9 %</td>
</tr>
<tr>
<td>Share of the Gender Pay Gap in Air transport in the tourism industry as a whole</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.79 %</td>
</tr>
</tbody>
</table>

→ Sum up all sectors weighted by the specific tourism share for the Gender Pay Gap of the whole tourism industry
**Gender Pay Gap in the German tourism industry**

Gender Pay Gap (in percent) by tourism industry; 2014 vs. 2018

(Official number of NACE economic sector in brackets)

Data basis: Own calculation based on official national statistics (Destatis); TSA Germany (DIW Econ et al. 2017 / Destatis 2021)
Quality of Labor Conditions in the German tourism industry

Quality of Labor Conditions Index by tourism industry; 2014 vs. 2018
(Official number of NACE economic sector in brackets)

Data basis: Own calculation based on DGB-Index; Scientific use file; TSA Germany (DIW Econ et al. 2017 / Destatis 2021)
Low wage quota in the German tourism industry

Low wage quota by tourism industry; 2014 vs. 2018
(Official number of NACE economic sector in brackets)

Data basis: Own calculation based on Destatis (2021); TSA Germany (DIW Econ et al. 2017 / Destatis 2021)
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