Towards the construction of an integrated statistical framework to measure sustainability: The case of tourism

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“Make your vacations not only memories, but also a cleaner and greener world thanks to sustainable decisions”

- World Tourism Organization (UNWTO)
Importance of measuring the sustainability of tourism (MST)

Measuring the Sustainability of Tourism (MST)
By UNWTO

- Allows to measure the positive and negative impacts of tourism.
- Allows to generate information to support the conservation of natural resources and cultural heritage.
- Allows to measure Goals 8.9 and 12.b of the SDG.

Progress of Mexico regarding MST
**USE OF ACCOUNTING TOOLS:**

**TOURISM AND ENVIRONMENT SATELLITE ACCOUNTS**

**Tourism**
- Sun and beach
- Business
- Cultural
- Health
- Gastronomy

**Environment**
- Environmental impact
- Environmental protection expenditure
- Ecosystem services:
  - Provisioning
  - Air regulation environment-climate
  - Cultural and recreational

**Recreation**
- Spiritual, artistic and symbolic services
- Nature tourism
- Adventure tourism

**Condition:**
- Management and control of visited tourist sites
- Supply of goods and services with low environmental impact

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**IDENTIFYING THE RELATIONSHIP BETWEEN TOURISM AND THE ENVIRONMENTAL BOUNDARY**

1. **Nature tourism economy**
   - **Wealth generated** in tourist sites where the protection of the environmental boundary is regulated.

2. **Impact of tourism on the environment**
   - Negative externalities to the environment generated by tourism industries and by visitor consumption (wastewater, solid waste, air emissions)

3. **Environmental benefits of tourist activities**
   - Positive externalities generated by tourism industries to benefit the environmental boundary (use of clean energy, energy saving, green jobs)
PROPOSAL TO MEASURE THE ECONOMY OF NATURE TOURISM

Measurement procedure:

1. Identifying sites with regulated tourism with zero or low environmental impact (Protected Natural Areas, PNA).
2. GIS tools as a measurement platform (PNA layer and tourist establishments).
3. Definition of the area of influence (Buffer or polygons).
4. Information from Economic Census (tourism module) and from the Tourism Satellite Account of Mexico.
PROTECTED NATURAL AREAS OF MEXICO

Annotations:
- Protected Natural Areas (PNA).

PROTECTED NATURAL AREAS OF MEXICO AND TOURIST BASIC GEOSTATISTICAL AREAS (AGEBs)

Annotations:
- Protected Natural Areas (PNA).
- AGEB_t
- AGEB: Tourist Basic Geostatistical Areas
PROTECTED NATURAL AREAS OF MEXICO AND TOURISM-RELATED ESTABLISHMENTS

Annotations:
- Protected Natural Areas (PNA)
- AGEB₁
- Tourist establishments
AGEB₁: Tourist Basic Geostatistical Areas

PROTECTED NATURAL AREA
ARRECIFES COZUMEL (COZUMEL REEFS)

Annotations:
PNA Arrecifes de Cozumel
ARRECIFES DE COZUMEL (COZUMEL REEFS) PROTECTED NATURAL AREA AND TOURIST AGEBS

Annotations:
PNA Arrecifes de Cozumel
AGEB1: Tourist Basic Geostatistical Areas

ARRECIFES DE COZUMEL (COZUMEL REEFS) PROTECTED NATURAL AREA, TOURIST AGEBS AND 5KM BUFFER

Annotations:
PNA Arrecifes de Cozumel
AGEB1
PNA Buffer (5km)
AGEB: Tourist Basic Geostatistical Areas
### DATA GENERATED
**PNA Arrecifes de Cozumel (Cozumel Reefs)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of establishments</th>
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</thead>
<tbody>
<tr>
<td>Tourist trade</td>
<td>640</td>
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<tr>
<td>Rental services</td>
<td>65</td>
</tr>
<tr>
<td>Travel agencies</td>
<td>17</td>
</tr>
<tr>
<td>Entertainment services</td>
<td>44</td>
</tr>
<tr>
<td>Accommodation and provision of food and beverages</td>
<td>524</td>
</tr>
<tr>
<td>services</td>
<td></td>
</tr>
<tr>
<td>Supporting services</td>
<td>51</td>
</tr>
<tr>
<td>Others</td>
<td>17</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,358</strong></td>
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</tbody>
</table>

### DATA GENERATED
**PNA Arrecifes de Cozumel (Cozumel Reefs)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Gross Value Added (Thousand of Mexican pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourist trade</td>
<td>520,543</td>
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<tr>
<td>Rental services</td>
<td>39,049</td>
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<td>Travel agencies</td>
<td>32,280</td>
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<td>Entertainment services</td>
<td>23,010</td>
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<tr>
<td>Accommodation and provision of food and beverages</td>
<td>255,796</td>
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<tr>
<td>services</td>
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<tr>
<td>Supporting services</td>
<td>6,641</td>
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<tr>
<td>Others</td>
<td>133,021</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,010,340</strong></td>
</tr>
</tbody>
</table>

It is possible to establish a gross value added proxy of the touristic PNA of interest.
OTHER ADDITIONAL VALUES OF PNA ARRECIFES DE COZUMEL (COZUMEL REEFS)

Ecosystem Services Valuation

- **Ecosystem services (valued)**: Recreation, Mangroves, Coastal protection
- **Methodology**: Choice experiment, Transfer of benefits, InVest
- **Related economic activities**: Recreation, Coastal protection, Mangroves
- **Valuation (contribution to well-being)**: $255 million dollars per year, $4.5 millions of dollars per year, $33.7 millions of dollars per year
- **Strategic Messages**: If reef attributes are lost, visits per year decrease by 12%, Mangrove services: recreation, coastal protection..., 65% of the island’s population is less vulnerable thanks to reefs and mangroves

CONANP-GIZ. 2017. Project for the Valuation of Ecosystem Services of Federal Protected Natural Areas of Mexico: an innovative tool for financing biodiversity and climate change (EcoValor MX). Mexico City, 2017

MEASURING THE IMPACT OF TOURISM ON THE ENVIRONMENT

**INDICATOR 12.b.1**

**Measurement procedure:**

1. Quantifying the number of tables coming from the TSA*
2. Quantifying the number of tables coming from SEEA*

* Developed under international standards:
  - System of Environmental-Economic Accounting 2012
NUMBER OF TABLES CONSIDERED IN THE MEASUREMENT OF INDICATOR 12.b.1

<table>
<thead>
<tr>
<th>TSA Tables</th>
<th>SEEA Tables</th>
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</thead>
<tbody>
<tr>
<td>Inbound tourism expenditure</td>
<td>Water flows</td>
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<tr>
<td>Domestic tourism expenditure</td>
<td>Energy flows (developing)</td>
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<tr>
<td>Outbound tourism expenditure</td>
<td>Air pollution (Proxy of GHG)</td>
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<tr>
<td>Internal tourism expenditure</td>
<td>Solid waste</td>
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<tr>
<td>Production accounts of tourism</td>
<td></td>
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<tr>
<td>industries</td>
<td></td>
</tr>
<tr>
<td>Domestic supply and internal tourism consumption</td>
<td></td>
</tr>
<tr>
<td>Employment in tourism industries</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

It is possible to progress in MST by linking statistical information and Geographic Information Systems (GIS) in the same platform (Digital Map of Mexico, National Accounts, Satellite Accounts, Economic Censuses, Cartography).

Inter-institutional coordination and the linkage of work teams within the agencies in each country is important. In Mexico, INEGI, CONANP and SECTUR worked together.

The implementation of the TSA and the SEEA, as well as the information generated, will contribute to the monitoring of goals and indicators of the SDGs 8.9 y 12.b.

International coordination is important to advance towards the consolidation and application of the MST Statistical Framework.
THANK YOU