Parallel session 5

New techniques in tourism statistics
Today’s approach

- Discussion focused; you drive the content
- Workshop/discussions
- ‘Sprint’ presentations/ discussions
- Report back to APES participants

Exchange knowledge on:

- new techniques in tourism statistics
- user needs, including data gaps for the SDGs
- optimising data quality and how we can integrate traditional data sources and methodologies
### Summary

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<th>Summary</th>
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<td>Direct comparison of proposal from UNWTO with existing approaches.</td>
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<td><strong>Digital Survey approach for tourism statistics (Indonesia)</strong></td>
<td>Digitisation of Passenger Exit Survey; electronic surveys for airline passengers who access airport wifi; explores links to integration with MPD</td>
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<td><strong>Use of big data as leading indicators of tourism demand (Indonesia)</strong></td>
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<td><strong>Use of Mobile Positioning Data (MPD) to obtain Accommodation statistics (Indonesia)</strong></td>
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<td><strong>Accommodation and the sharing economy (NZ)</strong></td>
<td>Analysis of experimental techniques to integrate ‘accommodation sharing’ into official tourism statistics</td>
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3 SDG targets that relate directly to sustainable tourism 8.9, 12.b and 14.7

UNDP identified links to all SDGs. Includes negative impacts.

Globally:

- 1.2 billion tourists crossing borders each year,
- 10% of world GDP,
- 1 in 10 jobs
- 7% of global exports
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Proportion of countries with, or with plans to develop, a TSA (2010) or SEEA (2006) (Percentage)

- **TSA**:
  - Developed economies: 69
  - Developing economies: 18

- **SEEA**:
  - Developed economies: 76
  - Developing economies: 22

*Source: UNCTAD*
Workshop exercise – state of play in the region

Discussion points:

• National policy priorities for tourism and how this is driving your official statistics
• Challenges for the NSO in responding/data gaps
• Innovations: strengths and weaknesses

Discussion leader:
• Views from all
• Report back on outcomes and interesting points from your discussion
Review on Tourism Direct Gross Domestic Product (TDGDP) Light – An Indicator for Measuring the Sustainability of Tourism

Authors:
K Megala Kumarran and Azrulnizam Zul

Presented by:
Azrulnizam Zul
National Accounts Statistics Division
Department of Statistics, Malaysia
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BACKGROUND OF STUDY

Target 12.b - develop and implement tools to monitor sustainable development impacts for sustainable that create jobs and promote local culture and products.

Target 14.7 - by 2030, increase the economic benefits to SIDS and LDCs from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

Target 8.9 - by 2030, devise and implement policies to promote sustainable tourism that create jobs and promote local culture and products.

BACKGROUND OF STUDY

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TDGDP LIGHT

Initiator:

- UNWTO Consultant, Institute for Development of Environmental-Economic Accounting (IDEEA Group), Feb 2018*

Objective:

- To generate alternative indicator value of Tourism Direct Gross Domestic Product (TDGDP) to measure tourism performance

Method:

\[
Value\ Added\ Ratio = \frac{\text{Gross Value Added (GVA)}}{\text{Total Output}}
\]

\[
TDGDP\ Light = \frac{\text{Gross Value Added (GVA)}}{\text{Total Output}} \times \text{Total Output (Tourism)}
\]

Source:

- Title: Proposal for Estimating Tourism Direct GDP with Limited Data

*Eighteenth meeting – Committee on Statistics and the Tourism Satellite Account in Madrid, Spain
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MALAYSIA’S FINDING

TDGVA Published* vs. TDGDP Light

- TDGDP Light value recorded >100% difference through the eighth years comparison.

<table>
<thead>
<tr>
<th>Tourism Industries</th>
<th>TDGVA Published (sd)</th>
<th>TDGDP Light (sd)</th>
<th>Mean score (95% CI)</th>
<th>t-stats (df)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation services</td>
<td>14.65 (2.19)</td>
<td>16.32 (2.94)</td>
<td>-1.67 (-2.84, -0.50)</td>
<td>-3.37 (7.00)</td>
<td>0.012</td>
</tr>
<tr>
<td>Food and beverage serving services</td>
<td>7.46 (1.19)</td>
<td>21.34 (5.33)</td>
<td>-13.87 (-17.37, -10.38)</td>
<td>-9.39 (7.00)</td>
<td>0.000</td>
</tr>
<tr>
<td>Passenger transport services</td>
<td>3.34 (0.72)</td>
<td>6.46 (0.90)</td>
<td>-3.12 (-3.51, -2.73)</td>
<td>-18.96 (7.00)</td>
<td>0.000</td>
</tr>
<tr>
<td>Travel agencies and other reservation services</td>
<td>0.79 (0.24)</td>
<td>1.60 (0.33)</td>
<td>-0.80 (-0.91, -0.69)</td>
<td>-16.50 (7.00)</td>
<td>0.000</td>
</tr>
<tr>
<td>Cultural, sports and recreational services</td>
<td>1.09 (0.33)</td>
<td>7.32 (1.06)</td>
<td>-6.23 (-6.90, -5.57)</td>
<td>-22.17 (7.00)</td>
<td>0.000</td>
</tr>
<tr>
<td>Retail trade (shopping)</td>
<td>25.19 (6.63)</td>
<td>62.16 (17.12)</td>
<td>-36.97 (-45.79, -28.15)</td>
<td>-9.91 (7.00)</td>
<td>0.000</td>
</tr>
<tr>
<td>Country-specific tourism characteristic services</td>
<td>3.61 (0.75)</td>
<td>18.05 (3.31)</td>
<td>-14.45 (-16.61, -12.29)</td>
<td>-15.82 (7.00)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

- The mean difference between TDGVA Published and TDGDP Light is significantly different from zero.
  
  E.g. Accommodation services:
  
  (p< 0.05, 95% CI -2.84, -0.50)

- The mean TDGDP Light is higher than TDGVA Published.

* TDGVA Published differ from TDGDP Published ~2%
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DISCUSSION

**PROS**

- Enabling all countries to generate TDGDP.
- Support sustainable development agenda.

**CONS**

- Huge gap as compared to value compiled through conventional method.
- Lead to data comparison issues internationally due to the different approach.

RECOMMENDATION

- Output of tourism industries used as a proxy for internal tourism consumption.
- Some possible ratio need to be applied to the output of tourism prior to calculate the TDGDP Light.

Thank You
The Use of Mobile Positioning Data to Obtain Accommodation Statistics: Case Study of Indonesia

- Statistics of Accommodation
- Big Data Approach & The Mechanism
- The Challenges and Solutions

Agus Ruslani (Agus);
Wa Ode Zuhayeni Madjida (Wawa);
Amin Rois Sinung Nugroho (Sinunk)

BPS – Statistics Indonesia

image source: https://paidsurveyfanatic.co.uk/online-survey-tips/earning-money-with-online-paid-surveys-uk/
Statistics of Accommodation

• 28,476 commercial accommodation: 3,314 starred and 25,152 non-starred commercial accommodation.
• Only 75% of starred reported monthly.
• Non-starred are unreported.
• Occupancy rate and average length of stay
Big Data Approach & The Mechanism

### Formula

\[ f_{ng} = l_{gf} + c_{igf} - c_{ogf} \quad \text{...(1)} \]
\[ d_{ng} = l_{gd} + c_{igd} - c_{ogd} \quad \text{...(2)} \]
\[ \text{avg}_{los,\text{foreign}} = f_{ng}/c_{igf} \quad \text{...(3)} \]
\[ \text{avg}_{los,\text{domestic}} = d_{ng}/c_{igd} \quad \text{...(4)} \]
\[ \text{avg}_{los,\text{total}} = \frac{\text{avg}_{los,\text{foreign}}}{\text{avg}_{los,\text{domestic}}} \quad \text{...(5)} \]
\[ \text{avg}_{los,\text{total}} = \frac{(f_{ng} + d_{ng})}{(c_{igf} + c_{igd})} \quad \text{...(6)} \]

### Algorithm

**START**

1. **Identify a tourism trip**
2. **Identify tourism trips at night**
3. **Calculate last day guests (lg)**
4. **Calculate today check in guests (cig)**
5. **Calculate today check out guests (cog)**
6. **Calculate number of nights**
7. **Calculate average length of stay**

**END**

For each date:
- Calculate last day guests (lg)
- Calculate today check in guests (cig)
- Calculate today check out guests (cog)
- Calculate number of nights
- Calculate average length of stay

**Directory of Accommodation**

Robot (Kapow) find the geolocation
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**Usual Environment**

**HOME**

**START**

- Home1 idver+staypoint (Jan-Apr’18) AND home1 staypoint only (May-Dec’18)

**SUM** the duration of their home1 per Kabupaten (5-6 month data)

**The home1_kabupaten with the max duration will be the home_kabupaten**

**END**

**OFFICE**

**START**

- Work1 idver+staypoint (Jan-Apr’18) AND work1 staypoint only (May-Dec’18)

**SUM** the duration of their work1 per Kabupaten (5-6 month data)

**The work1_kabupaten with the max duration will be the work_kabupaten**

**END**

Agus, Wawa & Sinunk
Challenges

- Validity of methodology
- There are some indicators that cannot be generated from MPD

Solutions

- Development of algorithm
- Volunteers for validating
- Combining collection method
Accommodation and the sharing economy in New Zealand

Presentation to Asia Pacific Economic Statistics Week 2019, June 2019

Presented by Hamish Grant
User needs

- Experimental estimate the size of accommodation sharing economy
- Why – understanding and maintaining our relevance for customers
  - Digital economy
  - Existing accommodation statistics
Methods & assumptions - revenue

- Approach – direct data, internet research, a few assumptions

- Method 1: direct sourcing of data
  
  Net revenue \times \text{Commission rate \%} = \text{Gross revenue}

- Method 2: commission/fee value and commission/fee rate
  
  \text{Commission value} + \text{Commission rate \%} = \text{Gross revenue}

Key

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<th>Data</th>
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<tr>
<td>Some uncertainty over data</td>
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<tr>
<td>Derived estimates</td>
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</tbody>
</table>
Methods & assumptions - revenue

- Method 3: properties and average income per property

- Method 4: properties, occupancy and average rate per night
Experimental estimates

Size of accommodation-sharing relative to total accommodation industry including accommodation-sharing, year ended March 2013–18

- Note the number of assumptions needed
Impact of assumptions – guest nights share

Impact of assumptions on accommodation-sharing 2018 guest nights as a percentage of total accommodation

Source: Stats NZ

- Note the number of assumptions needed
Digital Survey Approach for Tourism Statistics

Rina Indriani  Atika Nashirah Hasyyati  Titi Kanti Lestari
BPS-Statistics Indonesia
USER NEED

Policy maker in tourism area

Balance of Payment

National Accounts
METHODOLOGY

- Digital Survey Method

In collaboration with the biggest Mobile Network Operator

“FreeForTourist”

Free Wifi for 7 days with wifi.id
Percentage of International Visitors’ Expenditure During Their Visit in Indonesia, 2018

- ASEAN: 9.05%
- Other Asian Region: 12.29%
- MIDDLE EAST: 20.31%
- EUROPE: 14.77%
- AMERICA: 14.33%
- OCEANIA: 15.10%
- AFRICA: 14.14%
• The digital survey can be integrated with other approaches such as MPD and administrative data.
• The integration of official immigration data, MPD, and a digital survey for tourism statistics has some profound advantages.
The use of Big Data as Leading Indicators of Tourism Demand

Titi Kanti Lestari, Siim Esko, Alexander Rayner and Amalia A. Widyasanti
Data Sources used

1. Immigration Data
   - The main source of tourism data
   - Daily and raw data (passport level)

2. Mobile Positioning Data (MPD)
   - From the largest Mobile Network Operator (MNO)
   - Daily and raw data

3. Amadeus Data
   - From Global Distribution System (GDS) return bookings
   - Daily data
Figure 1. Comparison of arrival data from Immigration, Amadeus and MPD from 5 July to 31 August 2018, France to Jakarta
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Figure 2. Comparison of arrival data from Immigration, Amadeus and MPD from 5 July to 31 August 2018, US to Jakarta

Arrivals from the US to Jakarta

- Amadeus
- MPD
- Immigration
Figure 3. Comparison of arrival data from Immigration, Amadeus and MPD from 5 July to 31 August 2018, Australia to Jakarta.
Conclusions

1. Amadeus data and MPD can be used to predict International visitors to Indonesia from some countries, with a good correlation and high goodness of fit.

2. For other countries, there is a misalignment because of the country of origin definition.

3. Amadeus and MPD can be used for projections, and Amadeus can be used for forecasts/predictions based on forward bookings for the next 12 months, improving the quality of predictive analytics.

4. All three data sources have advantages and all the three data sources should be used together to minimise limitations.
Our conclusions?

Our objectives were to exchange knowledge on:

- new techniques in tourism statistics
- user needs, including data gaps for the SDGs
- optimising data quality and how we can integrate traditional data sources and methodologies