National Accounts Annual Webinar

Latin America and the Caribbean: Towards SNA 2025_Methodological update and new challenges in National Accounts measurements

Alternative indicators for measuring Tourism

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BIG DATA SOURCES

Exhaust data

- **Mobile phone data**
- **Financial transactions**
- **Online search and access logs**
- **Citizen card**
- **Postal data**

Sensing data

- **Satellite and UAV imagery**
- **Sensors in cities, transport and homes**
- **Sensors in nature, agriculture and water**
- **Wearable technology**
- **Biometric data**
- **Internet of Things (IoT)**

Digital Content

- **Social media data**
- **Web scraping**
- **Participatory sensing / crowdsourcing**
- **Health records**
- **Radio content**

What People Do

What People Say

SOURCES

*Online Booking site:
Booking.com and
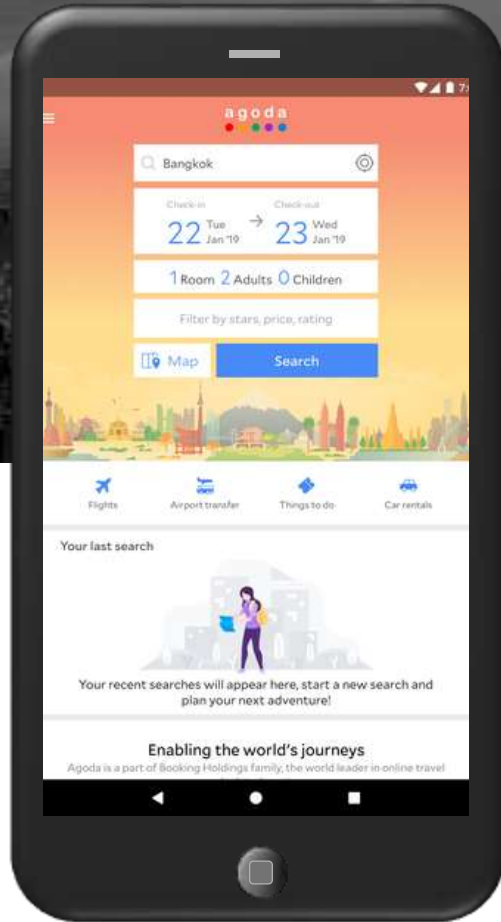Agoda.com*

**Review Sites:
Trip Advisor**

Google Trend

Google map

Online Booking Sites

Tourism statistics can be retrieved from various online accommodation booking service sites. These sites have quite diverse data such as the number of rooms available, rental prices, and other information.

Data Sources:
Website www.agoda.com,
www.booking.com

Data Acquisition Technique
Web scraping

More detail : http://informationr.net/ir/25-4/paper885.html

Agoda: Collected Variables

01 Accommodation ID

02 Accommodation Name

03 Accommodation Type

04 Date of Collection

05 Location

Number of Rooms available **06**

Total number of rooms **07**

Room Prices **08**

Star Rating **09**

$$ROR = \frac{Total\ rooms - available\ room}{Total\ rooms} \times 100$$

TripAdvisor: Collected Variables

01
Name
Name of the reviewer

02
Title
Feedback to the accommodation from the reviewer

03
Date
Date of the reviewer stay in that accommodation

04
Review_text
Explanation about the accommodation from the reviewer (can be positive feedback or negative feedback/improvement feedback)

Booking.com: Collected Variables

01 url
Link page of the review

02 place
Place that the reviewer visit

03 reviewer_name
Name of the reviewer

04 reviewer_country
Reviewer country of origin

05 room
Type of room that the reviewer used

06 long_stay
Duration of the stay from the reviewer

07 time_stay
Time of month when the reviewer visit

08 review_time
Time of the reviewer give the feedback/review of the accomodation

09 review_reaction
Reaction or comment feedback of the reviewer about the accommodation

10 review_score
Score given to the accommodation (1-10)

11 like_comment
Positive comment feedback from the reviewer about the accommodation

12 dislike_comment
Negative comment feedback/improvement feedback from the reviewer about the accommodation

About Google Trend

1. *Google Trends provides time-series data in the form of an index that shows the volume of queries entered by users in a region*

2. *Users can set their search data to start from the last hour or another range with a maximum for Google Trend data ranging from 2004 to the present. However, this maximum range is only available in the form of monthly data*

3. *It is a search ratio ranges from 100 to zero, where 100 indicates that the search term is relatively popular in the selected region.*

4. *According to Google, this normalization allows for smoother comparisons among search terms as search volume varies across different countries*

5. *Google Trend Index of different keywords are then combined by using weight resulted from Principle Component Analysis (PCA)*

Keywords

Bali	Maldives	Phuket
• Tourist Bali	• Tourist Maldives	• Tourist Phuket
• Hotel Bali	• Hotel Maldives	• Hotel Phuket
• Holiday in Bali	• Holiday in Maldives	• Holiday in Phuket
• Bali Tourism	• Maldives Tourism	• Phuket Tourism
• Bali Tourist Place	• Maldives Tourist Place	• Phuket Tourist Place
• Travel in Bali	• Travel in Maldives	• Travel in Phuket
• Bali	• Maldives	• Phuket

GOOGLE MAPS

Sources and Data Collection Methods.

Google Maps API

Web Scraping

Google API

✔ *The data collection process is carried out using the Python language with package **requests** and **urllib**.*

1. *Collecting Hotel, tourist places, restaurant coordinates in the province using the Geocoding API*

Web Scraping

✔ *The data was collected using the web scraping package selenium method which was applied to the Python and Java programming languages.*

1. *Hotel, tourism attractions, restaurant URL Collection*
2. *Detailed location Data Collection*

| ATTRIBUTE	TYPE	EXPLANATION	SAMPLE DATA
Name	String	place name	Angkringan Rumah Cerita
Full_Address	String	place address	Jl. Tukad Citarum No.25, Renon, Kec. Denpasar Sel., Kota Denpasar, Bali 80234
Website	String	place website (may NULL)	business.site
Plus_Code	String	place plus code	869M+FR Renon, Denpasar City, Bali
Rating_all	float	rating in overall	4.3
Reviews_counts	integer	total number of reviews	67
Review	String	review text (may NULL)	(Diterjemahkan oleh Google) Tempat kecil (Asli) Small places
Rating	float	rating given each reviews	3
time	String	time the reviews was given	setahun yang lalu

ACCOMMODATIONS LIST

Bali

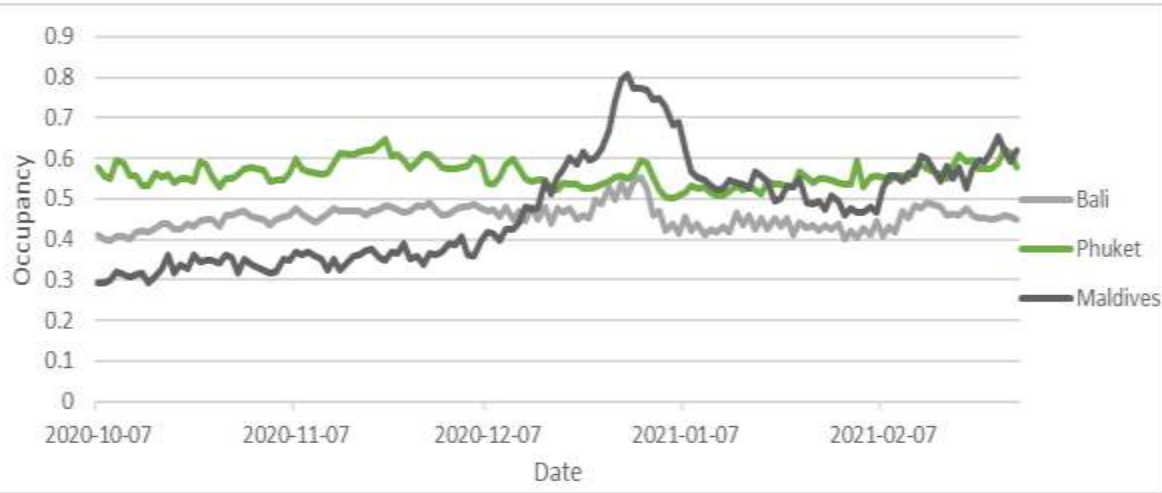| Type	Accommodation Type
Entire villa	1998
Guesthouse/bed and breakfast	1767
Hotel	1467
Resort villa	1186
Resort	1050
Villa	502
Homestay	407
Entire apartment	274
Entire bungalow	238
Hostel	190

Maldives
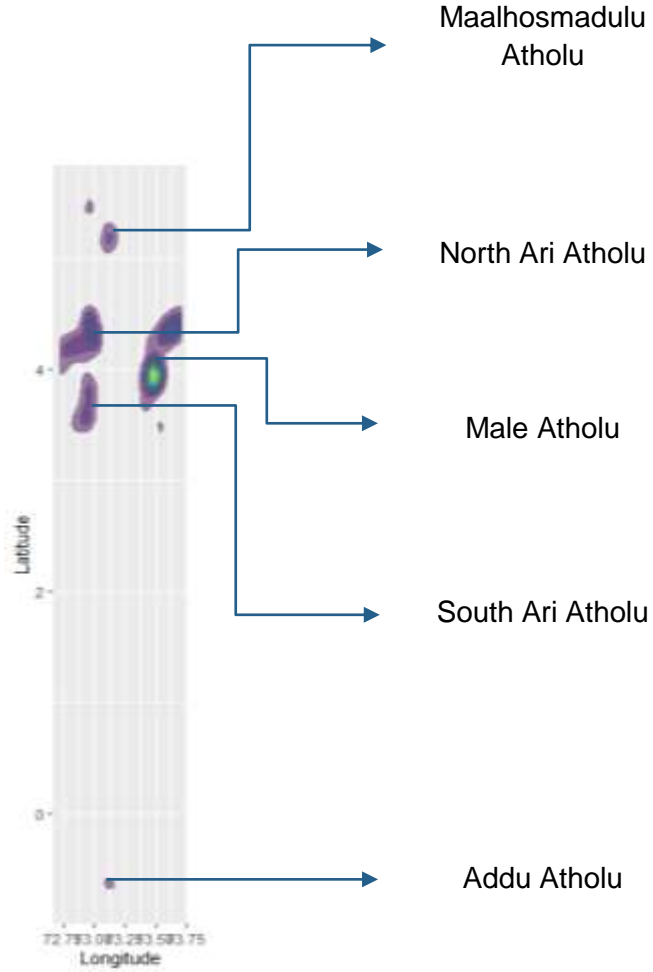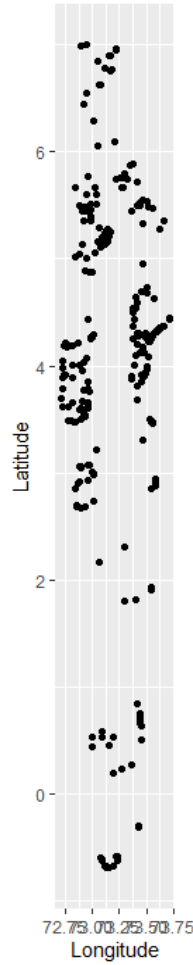
Maalhosmadulu Atholu

North Ari Atholu

Male Atholu

South Ari Atholu

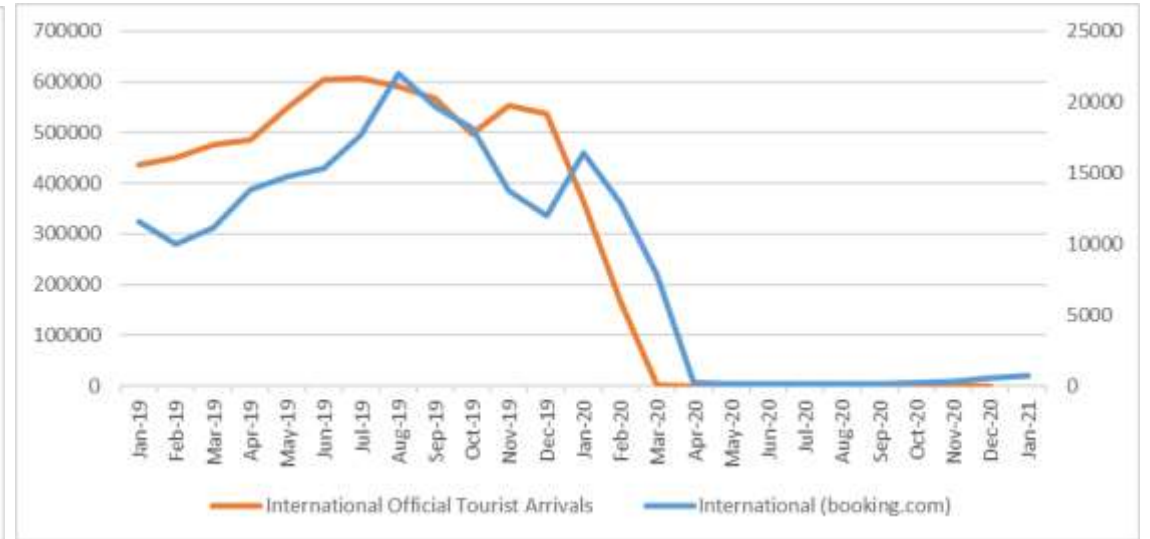Addu Atholu

ROOM OCCUPANCY AND NUMBER OF REVIEWS
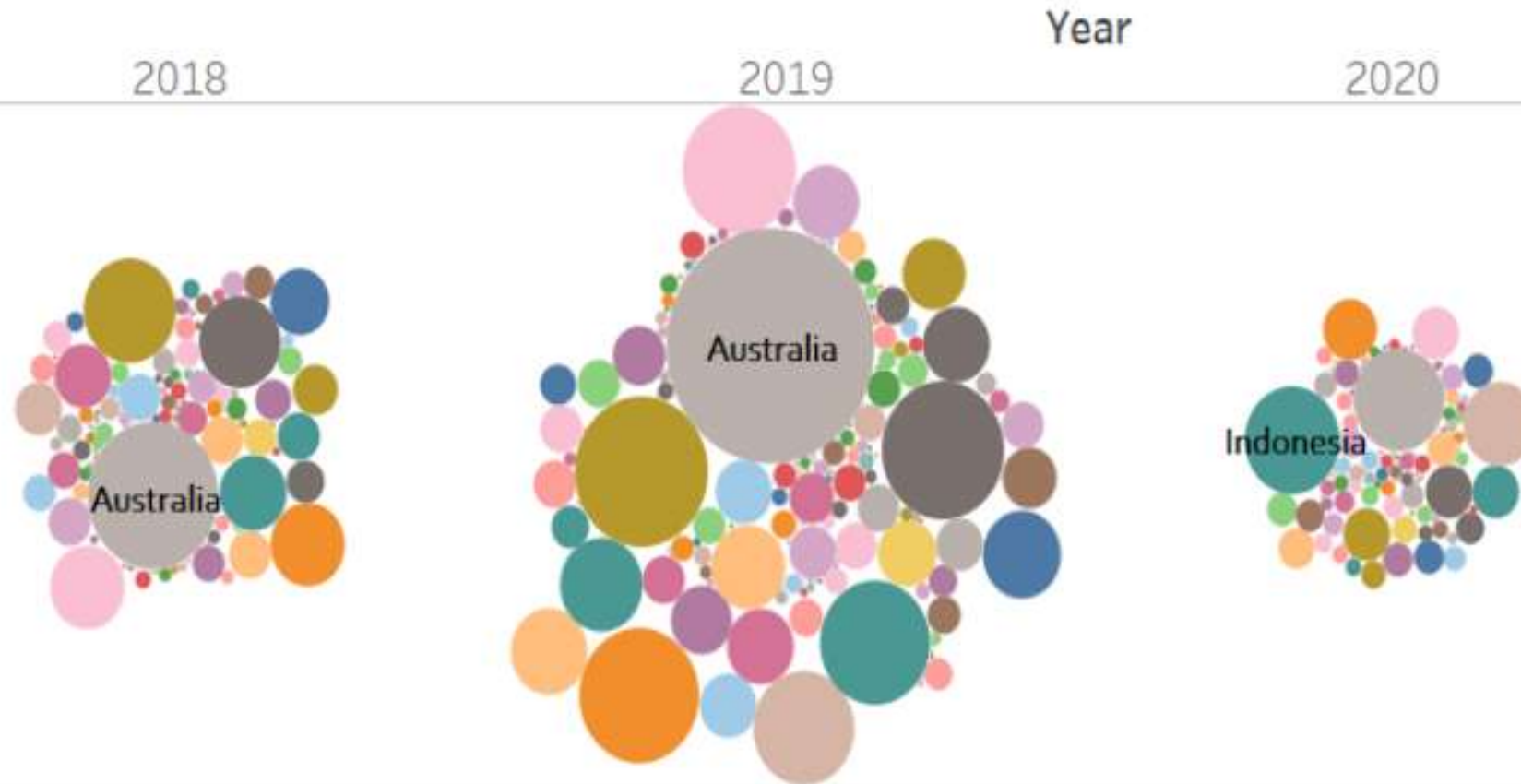

Hotel Room Occupancy Rate

Number of Reviews on Bali
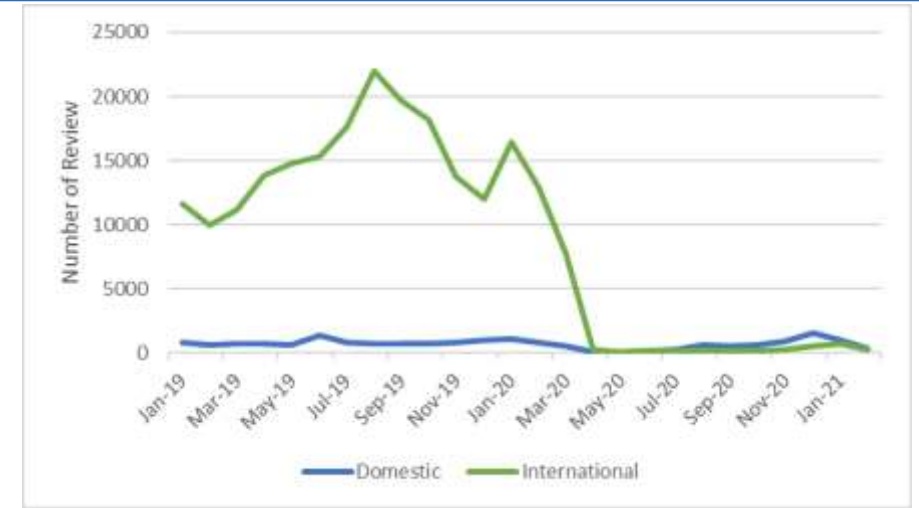
Hotel Room Occupancy Rate from Agoda, BPS and Google Trend in Bali
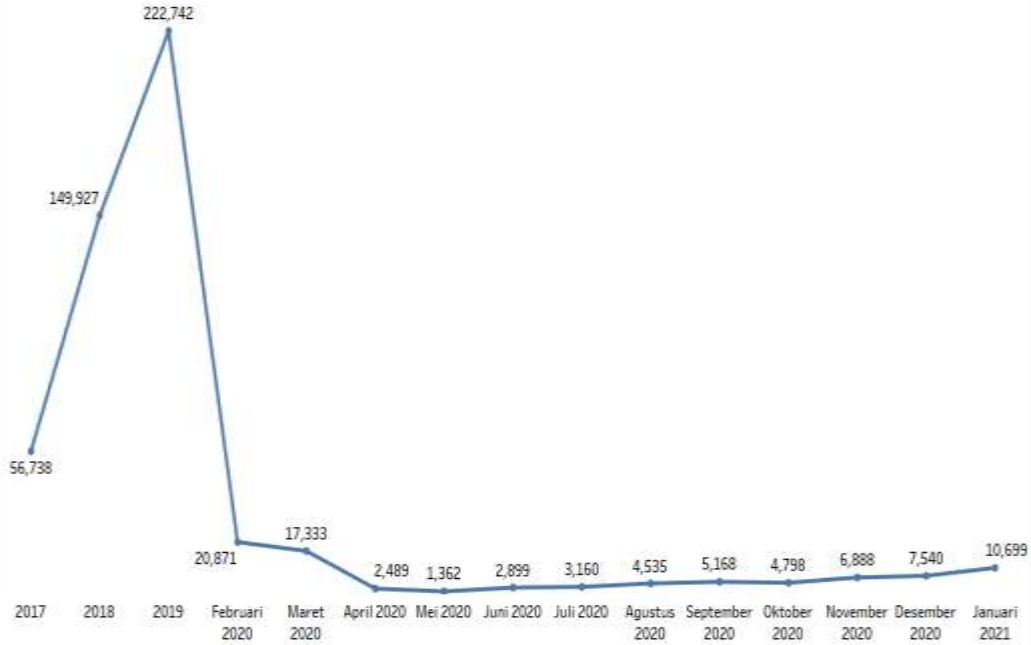
NUMBER OF REVIEWERS BY COUNTRY

RESULTS: GOOGLE MAPS
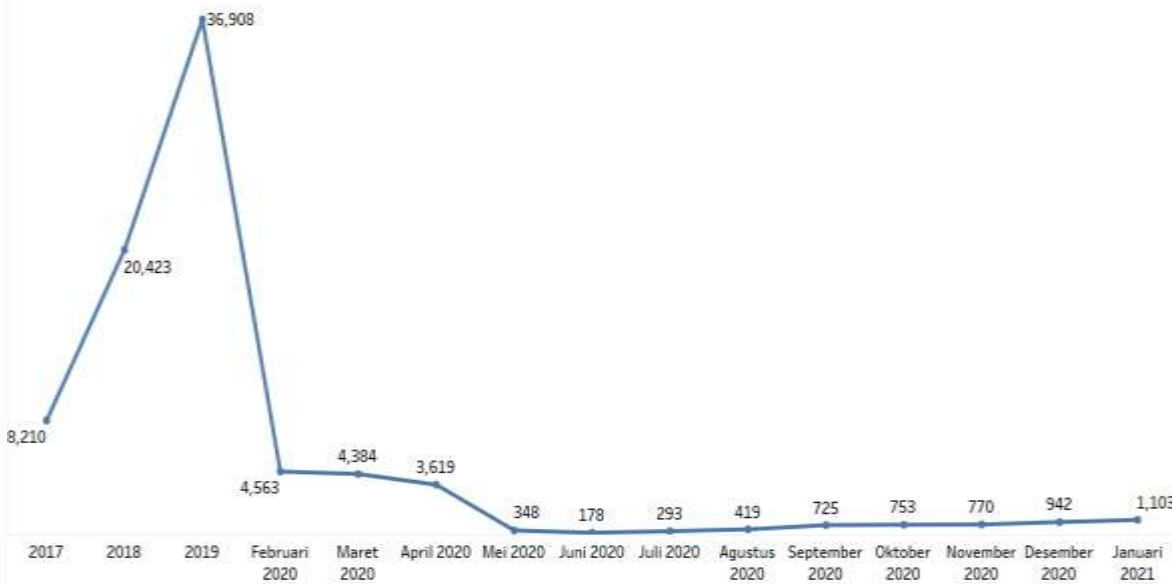
Number of Reviews of Tourist Places

The Number of Tourism Place Reviews in Bali Over Time

- 2017: 56,738
- 2018: 149,927
- 2019: 222,742
- Februari 2020: 20,871
- Maret 2020: 17,333
- April 2020: 2,489
- Mei 2020: 1,362
- Juni 2020: 2,899
- Juli 2020: 3,160
- Agustus 2020: 4,535
- September 2020: 5,168
- Oktober 2020: 4,798
- November 2020: 6,888
- Desember 2020: 7,540
- Januari 2021: 10,699

The Number of Tourism Place Reviews in Phuket Over Time

- 2017: 8,210
- 2018: 20,423
- 2019: 36,908
- Februari 2020: 4,563
- Maret 2020: 4,384
- April 2020: 3,619
- Mei 2020: 348
- Juni 2020: 178
- Juli 2020: 293
- Agustus 2020: 419
- September 2020: 725
- Oktober 2020: 753
- November 2020: 770
- Desember 2020: 942
- Januari 2021: 1,103

- *Various Data Sources can be used as alternative for Tourism Statistics*
- *The variables, information, and data availability are different across the platforms and sources.*
- *Need data cleaning, aggregation and integration to combine them into a system of official statistics*
- *These alternatives data sources can be used as complement of the existing tourism statistics*

Take Home Messages