

Hotels and Airbnb Accommodations in the Greater Yogyakarta Urban Region - Indonesia: Competition or Complementarity?

Azis Musthafa^{1*}, and R. Rijanta²

¹ Department of Development Geography, Faculty of Geography, Universitas Gadjah Mada Yogyakarta, Indonesia, 55281

² Department of Development Geography, Faculty of Geography, Universitas Gadjah Mada Yogyakarta, Indonesia, 55281

*Corresponding author, email: azis.musthafa@mail.ugm.ac.id

ABSTRACT

Tourism, as the backbone of the economy of Yogyakarta Municipality, is also the main source of demand for accommodation services. Under these circumstances, Airbnb penetrates the accommodation market in the Greater Yogyakarta Urban Region (GYUR). As a company using the principle of the sharing economy, it specialises in accommodation services. Airbnb has grown tremendously, as it acquired 1,164 accommodation partners in the GYUR in 2017. The hotel industry is probably among the most affected by the presence of Airbnb. The rise of the sharing economy platforms seems to create competition between hotels and Airbnb accommodations. Based on this phenomenon, further research is necessary to investigate whether the two will compete with each other or, instead, complement the tourism demand in Yogyakarta. This paper focuses on examining the competition between hotels and Airbnb accommodations in the GYUR both in spatial and temporal terms. This research was conducted based on secondary data analysis and field observations. Secondary data analysis was performed through mapping of the distribution of hotels and Airbnb accommodations to explore possible competition between the two. Field observations focus on describing the neighbourhood environments and the accessibility of both types of accommodations. The research shows that Airbnb accommodations are mainly concentrated in the densely populated areas in the urban centre and in tourism-associated areas. Hotels are located in the best part of the city and are situated in close proximity to the city centres, allied infrastructure, and facilities. The high demand for accommodation in the GYUR enables the locals to register their assets as Airbnb accommodation. This is also caused by the absence of regulations governing this home-sharing activity.

INTRODUCTION

The year 2013 was the beginning of an era of companies with sharing-economy platforms that emerged in Indonesia. Gojek is a startup company with a ride-sharing platform that has now evolved into an on-demand mobile platform that provides a variety of transportation services, logistics, payment, delivery services and other services. The sharing economy concept is often referred to as the on-demand economy, peer-to-peer economy, collaborative consumption, and collaborative economy. Collaborative consumption, according to Botsman

and Roger (2011), is the reinvention of traditional market behaviours -such as renting, lending, swapping, sharing, bartering, gifting- through technology, taking place in ways and on an unprecedented scale before the internet. The sharing economy is merely a business model, favouring digital ecosystems. According to Gansky (2010), mesh businesses are based on network sharing to get access rather than owning. The main strategy of the mesh business is to sell (by renting out) the same product several times.

The development of Airbnb in the GYUR was stimulated by high demand for accommodation from a large number of tourists, especially during the holiday season in Indonesia. Domestic tourists also periodically visit Yogyakarta City during national holidays. They occupy all available accommodation and create heavy traffic jams everywhere. However, tourism is not the only driver of the growing number of Airbnb in the GYUR. The presence of about one hundred and ten private and State universities with 300,000 University students also creates significant demands for temporary accommodations, especially during graduation days. Celebrations of University graduation in Indonesia commonly involve the whole family or even extended family members, which would demand much affordable accommodation in the city. This group of temporary visitors prefers Airbnb accommodations rather than hotels, as it is much more affordable, but located in the heart of the city, where they also spend their limited time for recreational purposes.

Competition between hotels and Airbnb accommodation in Indonesia has been responded to confidently by the Vice Director of the Indonesian Association of Hotels and Restaurants (PHRI), who said that conventional hotels would be able to compete with Airbnb as they have much experience in service provision for their guests. Conventional hotels offer better comfort, safety and security for their guests. Nevertheless, it is also admitted that Airbnb accommodations are much cheaper in terms of room price, but no quality services are provided, as young people mostly run them and expect young guests who prefer low-cost accommodation. Finally, the PHRI expects the government to impose a regulation for businesses similar to Airbnb (Kompas, 2017). Governments in many countries are often late in responding to a new phenomenon like the sharing economy. Airbnb is one of the phenomena that the government is responding to too late with appropriate regulation. It appears that the hotel industry condemns its existence as it creates a new competitor in which the hotels, in some aspects, would never win.

At present, there are no specific set regulations governing the sharing-based accommodation business. The development of Airbnb accommodation in the GYUR emerges at the same time as the enactment of the Yogyakarta Mayor's Regulation regarding the moratorium on the issuance of hotel building permits, which would expire at the end of 2017. The number of tourist visitors that continues to grow from year to year requires an increase in the stock of accommodations. Thus, the presence of Airbnb in the city seems to complement the temporary shortage of accommodations during the peak seasons of tourist visits. The peak period of tourist visits in Yogyakarta City would reach its extreme during June-August, when

the summer holiday in Europe coincides with school holidays, the Muslim Holiday of Idul Fitri in Indonesia. The sufficiency of accommodations in a city is a key factor that would affect the functions of many other urban activities, both in tourism-supporting services and tourism attraction objects that would spur the urban economic life. The city would benefit from this nexus, especially through employment creation, income generation for the people and revenue generation for the municipal government.

The impact of the sharing economy on the hotel industry has been widely researched in various countries and cities (Horn & Merante, 2017; Xie & Kwok, 2017; Xu et al, 2017; Gunter, 2018; Dudás et al, 2017; Wegman & Jiao, 2017; Gutiérrez & Salas-Olmedo, 2017). The development of a platform based on the sharing economy concept often gets negative responses from the relevant stakeholders. Meanwhile, the use of technology and geolocation has made the Airbnb platform develop rapidly, although its impact does not clearly affect the demand. However, this platform has expanded very quickly and successfully in filling the gap of providing cheap and reliable accommodation services while also presenting various new experiences for the accommodation users. Given the fact that the presence of Airbnb was not considered as competitors by the professional organisation such as PHRI in Indonesia on one hand and the fact that Airbnb has been growing tremendously on the other, it is very important to explore the emerging competition between conventional hotels and Airbnb accommodations in spatial perspective in GYUR of Indonesia as the second most important tourist destination after Bali.

THEORETICAL FRAMEWORK

The sharing economy is changing the consumption patterns all over the world (Zervas et al, 2016). Sharing economy has some benefits for the customers, such as easy access, lower cost for various services, and the suppliers, it enables them to provide convenience in producing and serving at any time and anywhere[The Sharing Economy: Share and make money How does Switzerland compare (Deloitte)]. Sharing economy (Turino, 2016) does not have to possess and fully control the needed resources; it requires access to borrow and rent the resources from the owners and then offer them to the other parties in need through online applications. This platform can optimise the idle or underutilised assets. Previous studies have discussed the contribution of the sharing platforms for sustainable development by associating them with economic, social, and environmental aspects. The benefits gained from the sharing platforms are like environmentally astute resource management, social bonds strengthened by the work of collaborating, and economic value in making goods go further (Light & Miskelly, 2015).

Motivation to participate in a sharing economy platform is influenced by the type of goods to be shared (Bocker & Meelen, 2017). Car and ride sharing was motivated by the spirit of environmental protection. Personal interaction would be the social motivation for meal sharing and the expensive property of accommodation sharing; for example, Airbnb was

motivated by the economic aspect. Airbnb is a company that is engaged in the accommodation sector. It was established in August 2008 and is based in San Francisco. Based on the official website of Airbnb, Airbnb is a trusted marketing community for people who want to advertise, discover, and also order a variety of unique accommodations around the world online via mobile or tablet. Airbnb has spread in more than 190 countries and received 459 million US dollars of investment in early 2014. Airbnb, on average, serves 425,000 guests overnight, more than the Hilton hotel chain worldwide.

The ease of each individual in accessing the internet through geolocation-based devices and applications (the system identifies the geographical location of an object through a cellphone connected to the internet) allows anyone to contribute to the sharing economy. Each individual can be a service provider or can be the individual who rents out the assets. Airbnb is one company that offers lodging or temporary accommodation through its website and geolocation. Airbnb provides the opportunity for every individual who has assets, whether part of the house or all of them, to rent them with specific management standards.

THE OBJECTIVE

This paper describes the emerging spatial competition between Airbnb accommodations and conventional hotels based on the assessment of spatial distribution patterns of both types of accommodations in the GYUR as an international tourist destination. The comparison of both distribution patterns would enable an evaluation of the spatial competition between conventional hotels and Airbnb accommodations. At the beginning of the discussion, patterns of reservation by month throughout the year between conventional hotels and Airbnb accommodations would be assessed. This would enable more comprehensive discussions of competition across time and space, as given in the last section of the paper.

METHOD

This research was conducted using secondary data analysis and field observations. Airbnb data were obtained from Airdna, an analytics platform of Airbnb. Conventional hotel data were extracted from the statistical book of the Yogyakarta Special Province from the same year. The data analysis was conducted by mapping the data using Geographic Information Systems to explain the spatial competition between Airbnb accommodations and conventional hotels. The spatial analysis method, employing direct map observation to qualitatively identify distribution patterns, is aligned with fundamental GIS techniques (Musthofa, Wicaksono, & Rijanta, 2025). In addition, descriptive statistics were also employed to illustrate the statistical comparison of Airbnb and conventional hotel accommodations using charts. Field observations were carried out to support the analysis and to find various cases that could not be obtained through secondary data. Among the important data obtained through observation are the conditions of Airbnb accommodations and their

surroundings, the conditions of nearest urban services, the availability of convenience shops, the proximity to various services such as restaurants, and the ease of finding public transportation means.

RESULTS AND DISCUSSION

The Yogyakarta City has been labelled as the City of Tourism because of its various tourism attractions, namely cultural tourism, nature tourism, culinary tourism, shopping tourism, as well as meetings, incentives, conferences, and exhibitions (MICE). The City of Yogyakarta, as a part of GYUR, is the hub of tourism activities in Yogyakarta Special Province. It is the most urbanised area with many tourist attraction centres supported by the availability of facilities and infrastructure. Based on the available statistical data, in 2016, the number of visitors in Yogyakarta City alone reached 5.5 million visitors, consisting of 4.52 per cent of foreign visitors and 95.48 per cent of domestic visitors (Statistical Office of Yogyakarta, 2017). The number of Airbnb accommodations in the Yogyakarta Special Province has reached a total of 300 units [https://www.airbnb.com/s/yogyakarta/all?refinement_paths%5B%5D=%2Ffor_you&search_type=search_query] (accessed through Airbnb pages, keyword: Yogyakarta) and they are spatially concentrated in Yogyakarta City and its surroundings. The increasing number of tourists also stimulated the development of conventional hotels in the GYUR. However, tourism is not the only cause of the growing number of Airbnb developments in Yogyakarta City, since it is only seen by the number of visitors as their demand. The availability of accommodation can be more accurately seen from the availability of the houses and rooms that can be rented out (Musthafa, 2019).

Competition between the accommodation Airbnb and hotels is a new phenomenon in the GYUR. The high number of tourists (both foreign and domestic) every year has made this region run into difficulties in providing a sufficient supply of accommodations to meet the increasing demands. The number of tourists that continues to grow from year to year also requires an improvement in the capacity of other urban amenities, including transportation and other supporting services.

The growth of Airbnb accommodation is very fast because every individual who owns properties, such as a house or room, can easily rent them out through this sharing platform. Meanwhile, the hotel industry has experienced stagnant growth partly due to the moratorium on hotel building permits imposed by the municipal government. Prior to the construction process, hotel building plans must undergo various examinations to obtain a permit in accordance with the Yogyakarta Mayor's Regulation. The municipal government would impose stricter regulations regarding the hotel development after the moratorium on hotel building permits.

There are three types of Airbnb accommodation rental systems in general: (1) house or apartment, (2) private room, and (3) shared room. According to Ke (2017), the house or

apartment type provides the accommodation without the presence of the host when the service is ongoing. On the other hand, the private room type provides accommodation where the host still occupies the same house building, and the spare rooms are rented out to specific guests. Lastly, the shared room type provides accommodation where one guest has to share the same room with another guest. In his research involving 30 countries as his object of study, Ke (2017) states that house or apartment type dominates the Airbnb accommodation in 27 countries, including Indonesia. In contrast, private room type dominates the Airbnb accommodation in Yogyakarta City instead. The domination of private rooms among Airbnb accommodations in Yogyakarta City was most probably related to the past pattern of renting out one or two rooms of a house for students. However, this is not the case today, as many University campuses have been relocated outside the municipal area for a better environment. Table 1 shows an interesting finding that private rooms dominate the Airbnb accommodation type in GYUR. Of 1,162 hosts of Airbnb accommodations, 725 were private rooms, a significantly higher number compared to the other rental types.

Among the main reasons for the domination of private rooms instead of entire house or apartment rentals via Airbnb in GYUR was the living experiences gained while staying in the accommodations. This includes the experiences of interacting with the local people, living in local-traditional settlements called kampung (kampong) with their genuine cultural environments, and exchanging various information directly with the local people. From the customer's perspective, a private room type of accommodation indirectly forces the guest to use the common facilities like the kitchen, toilet, and living room. While doing so, the guest will definitely interact with the hosts. Most of the Airbnb hosts in the GYUR are local people who are very polite and humble when treating their guests. The Yogyakarta people are renowned for their excellent hospitality toward tourists and their deep Javanese culture in their daily lives as well. Meanwhile, conventional hotels do not provide this kind of atmosphere, which is rich in local cultures and customised services like Airbnb accommodations do. The formality and standardised services provided by the conventional hotels do not provide a space for an intense interaction between the hosts and the customers. Moreover, Airbnb has various types of properties and rental types that suit different travelling purposes, either for individuals or families. This Airbnb accommodation brings the best out of Yogyakarta City tourism as it is very convenient for travellers with different socio-economic backgrounds, modes of travel, group sizes, and purposes of trips. Using Airbnb accommodation services in GYUR, you will have the opportunity to learn and experience Javanese culture.

Table 1. The Number of Airbnb Accommodation Categorized by Accommodation Type in Greater Yogyakarta Region, 2017

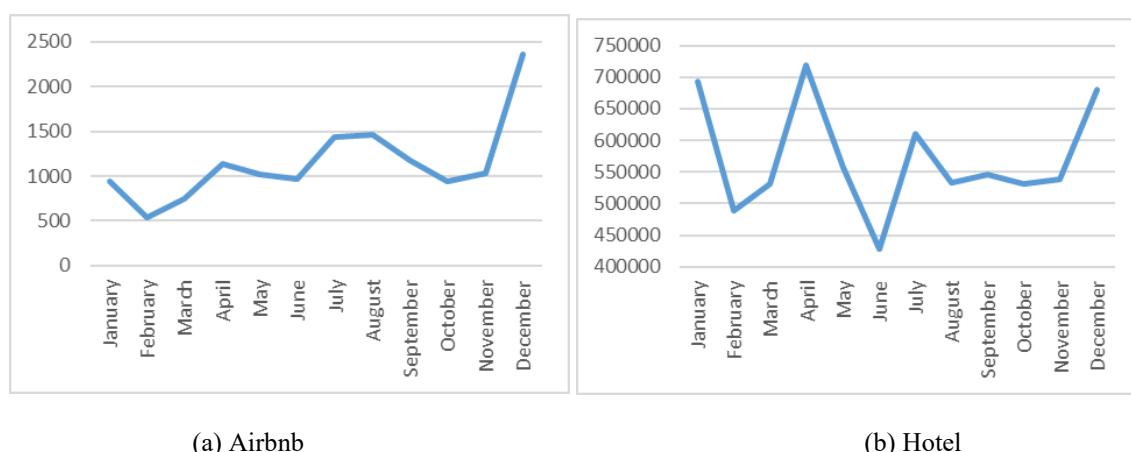
Listing Type of Accommodation	Number of Accommodation
Entire home/apartments	341
Private rooms	725

Listing Type of Accommodation	Number of Accommodation
Shared rooms	96
Total	1162

Source: AirDNA, 2017

The result of this research showed that the reservation density of both conventional hotels and Airbnb accommodations varies throughout the year (Figure 1). In 2017, the Airbnb reservation was dynamically fluctuating and especially peaking in April, July, August, and December. Such fluctuations were somehow related to holidays in both national and international seasons. Similar to the number of Airbnb accommodation reservations, hotel reservations that occurred in 2017 have the same fluctuation pattern. High reservation numbers occur in certain months, and the number of reservations was recorded based on the number of accommodation users, not based on the booking accounts like the Airbnb reservation data. Each house that is rented using Airbnb has a limited number of rooms, unlike the hotel industry, where one building could provide a large number of rooms. The high number of Airbnb accommodations in Yogyakarta is still too small and not comparable to the number of guests of conventional hotels. The number of Airbnb accommodation users is too small, but they already occupy most of the available properties. This means that there is ample space for the development of Airbnb accommodation to complement the shortage of rooms in conventional hotels during the peak holiday seasons. Furthermore, the Airbnb accommodations seem to have very different market segments, and there is no significant competition between conventional hotels and Airbnb accommodations. This confirms the statement of the Vice Director of PHRI that they have long experience in quality service in the provision of accommodation (Kompas, 2017).

Figure 1. The Number of Airbnb Users and Hotel Reservation in GYUR 2017

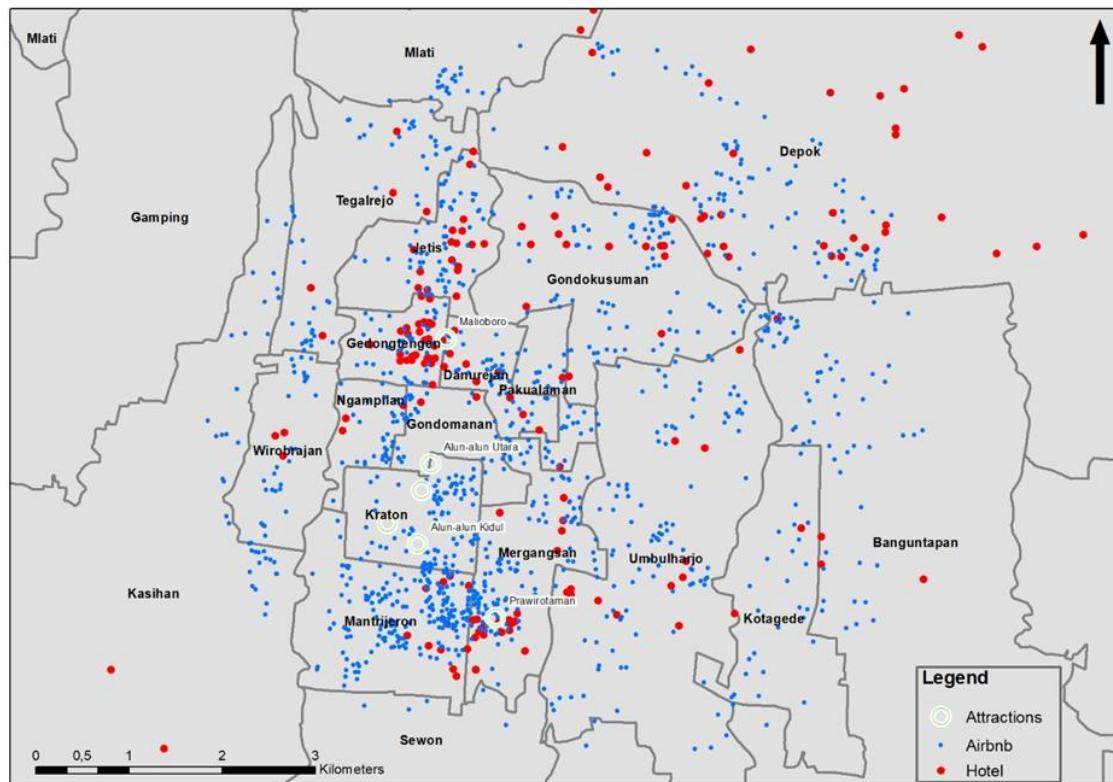


(Source: Airdna, 2017 and Statistical Office of Yogyakarta, 2017)

Airbnb provides many user-friendly features, enabling users to choose the most suitable accommodation. They also provide queries to filter reservation dates, rental types, pricing, travelling types, room types, offered facilities, age specification of guests, house rules, and even the language spoken by the hosts. Ert et al (2016) state that the selection process of accommodation by the users is strongly correlated to the host profile provided on the Airbnb website. The related profiles include both visual and non-visual attributes. The visual attribute consists of a photograph of the house, room, and/or facilities provided by the host, while the non-visual attribute consists of ratings and reviews provided by previous guests. It is clear that the distribution of visitors and tourists throughout the year in 2017 was complementary rather than competitive between conventional hotels and Airbnb accommodation in the GYUR. These two types of accommodation share similar patterns of reservation distribution throughout the year, indicating that both types of lodging have different market segments.

From a spatial perspective, conventional hotels tend to concentrate on the city centre, in the northeast, and in the south (Figure 2). The first hotel cluster in the city centre was associated with the city centre itself, where the provincial government house, the Sultan Palace, the Presidential Palace, the largest traditional market and the largest shopping centre are located. The second hotel cluster is located in the northeastern part of the city and is associated with various services and amenities such as Gadjah Mada University, Adisucipto International Airport, and a shopping mall. The third cluster of hotels is situated in the south, i.e., in the Prawirotaman area, where large houses for batik production in the past were converted into hotels. The conventional hotel is mainly located in the most strategic location with the best access to various services and amenities within and outside the city. Conventional hotels are usually located along highways or arterial roads close to (at least) one of the public transportation access points, such as bus stops, stations, and/or airports.

Figure 2. Spatial Distribution of Airbnb Accommodations and Hotels in the Greater Yogyakarta Urban Region, 2017



(Source: Airdna, 2017 and Statistical Office of Yogyakarta, 2017)

Meanwhile, Airbnb accommodations are spreading almost evenly across the city space, more especially in the residential areas, and they exhibit a higher density compared to conventional hotels. There is a strong indication that tourism spots around the densely populated kampong area acted as a strong pull factor towards the reservation density of Airbnb accommodations. This means that a higher Airbnb accommodation density will follow the high intensity of economic activity in the kampong settlement. The main tourist spots located in the kampong area are associated with the Sultan Palace (Taman Sari, Alun-alun Kidul, Alun-alun Utara, and Malioboro). Those areas have become the cultural heart of Yogyakarta for a long time. As it is also reported elsewhere, the Airbnb location pattern is linked to the city centre and tourism attractions (Gutiérrez & Salas-Olmedo, 2017). Hence, they also had a strategic location, good accessibility, and great culinary spots as well (Wegman & Jiao, 2017). On the other hand, the Prawirotaman area was also indicated as a high residential density area. Nevertheless, Prawirotaman had a different pull factor from the previous area. Prawirotaman possessed the facilities to fulfil the tourism needs, such as bars, restaurants, and travel

agencies. The contingent of this area was also supported by a major hub that connects Yogyakarta to other regions (i.e. Yogyakarta Railway Station) and is not far from the Southern Ring Road to connect to Jakarta or Surabaya. Besides that, many Airbnb accommodations have poor access as they are located in the residential kampong area. The road to this kind of accommodation usually consists of narrow streets or alleys that are difficult to reach using cars. Some of these accommodations are not close enough to tourist attractions, restaurants, public transportation, and other supporting facilities.

Given the disparities in the number of accommodations, reservation volumes, and spatial distribution, there exists a fundamental difference that implies distinct demand segments among users. Airbnb accommodations offer a novel experience characterized by intensive interaction with the host and immersion in the local neighborhood environment. This stands in stark contrast to conventional hotels, which provide standardized services and more private facilities. This distinction indicates a difference in user objectives when selecting accommodation.

Basically, there has been no single regulation to control Airbnb accommodation in Indonesia, such as a permit for private housing utilisation for commercial accommodation uses, as has been done in Amsterdam in the Netherlands. Meanwhile, many regulations related to hotel development have been issued by the government as a regulator. Hotel building moratorium and various feasibility studies for licensing indicate that hotel regulations have been prepared very well. Dialogue between the government and sharing-economy participants really needs to be considered (Quattrone et al, 2016). Government institutions are expected not only to regulate sharing economic activities but also to arrange the future development of the socio-technical infrastructure that arises when the sharing economy increases (Frenken, 2017).

CONCLUSION

The presence of Airbnb as a platform of the sharing economy of residence has generated a lot of responses in various countries, especially from the hotel industry. Airbnb is often seen as a competitor that can disrupt the conventional hospitality industry. The hotel has a strategic location, and it is based on the prevailing spatial regulations, while Airbnb can grow anywhere with a fast process because there are no regulations governing the home-sharing activities. The density and the spatial concentration of Airbnb accommodation are always in the centre of the city, as the central business district, and also in various tourist attractions. Similar to the hotels, although Airbnb grows in the residential areas, the concentration and the high-intensity reservations occur in the areas where the hotel has already been built, with various facilities available (good access). This shows that no spatial and temporal competition is emerging between hotels and Airbnb accommodations in the GYUR. Rather, the two types of accommodations are complementary, providing accommodation services for the tourists and other visitors to GYUR.

ACKNOWLEDGEMENTS

The support of the Head of the Department of Development Geography is acknowledged for granting the permit to use the facilities of the Laboratory of Spatial Planning to prepare maps and spatial analyses to accomplish this work.

REFERENCES

- [1] R. Botsman and R. Rogers, *What's Mine Is Yours: How Collaborative Consumption Is Changing the Way We Live*. London, UK: HarperCollins, 2011.
- [2] L. Gansky, *The Mesh*. New York, NY, USA: Penguin Group, 2010.
- [3] H. Turino, *Meretas Konsep Ekonomi Berbagi*. Tangerang Selatan, Indonesia: Kesuma Putra Kreatif, 2016.
- [4] Statistical Office of Yogyakarta, *Yogyakarta Municipality in Figures*. Yogyakarta, Indonesia: Statistical Office of Yogyakarta, 2017.
- [5] L. Bocker and T. Meelen, "Sharing for people, planet, or profit? Analysing motivations for intended sharing economy participation," *Environ. Innov. Soc. Transit.*, vol. 23, pp. 2–39, 2017, doi: [10.1016/j.eist.2016.09.004](https://doi.org/10.1016/j.eist.2016.09.004).
- [6] E. Ert, A. Fleischer, and N. Magen, "Trust and reputation in the sharing economy: The role of personal photos in Airbnb," *Tourism Manag.*, vol. 55, pp. 62–73, 2016, doi: [10.1016/j.tourman.2016.01.013](https://doi.org/10.1016/j.tourman.2016.01.013).
- [7] K. Frenken, "Political economies and environmental futures for the sharing economy," *Philos. Trans. R. Soc. A*, vol. 375, no. 2095, 2017, Art. no. 20160367, doi: [10.1098/rsta.2016.0367](https://doi.org/10.1098/rsta.2016.0367).
- [8] G. Dudás et al., "A socio-economic analysis of Airbnb in New York City," *Reg. Stat.*, vol. 7, no. 1, pp. 135–151, 2017, doi: [10.15196/RS07108](https://doi.org/10.15196/RS07108).
- [9] U. Gunter, "What makes an Airbnb host a superhost? Empirical evidence from San Francisco and the Bay Area," *Tourism Manag.*, vol. 66, pp. 26–37, 2018, doi: [10.1016/j.tourman.2017.11.003](https://doi.org/10.1016/j.tourman.2017.11.003).
- [10] J. Gutiérrez and M. H. Salas-Olmedo, "The eruption of Airbnb in tourist cities: Comparing spatial patterns of hotels and peer-to-peer accommodation in Barcelona," *Tourism Manag.*, vol. 62, pp. 278–291, 2017, doi: [10.1016/j.tourman.2017.05.003](https://doi.org/10.1016/j.tourman.2017.05.003).
- [11] K. Horn and M. Merante, "Is home sharing driving up rents? Evidence from Airbnb in Boston," *J. Hous. Econ.*, vol. 38, pp. 14–24, 2017, doi: [10.1016/j.jhe.2017.08.002](https://doi.org/10.1016/j.jhe.2017.08.002).
- [12] J. Wegmann and J. Jiao, "Taming Airbnb: Toward guiding principles for local regulation of urban vacation rentals based on empirical results from five US cities," *Land Use Policy*, vol. 69, pp. 494–501, 2017, doi: [10.1016/j.landusepol.2017.09.025](https://doi.org/10.1016/j.landusepol.2017.09.025).
- [13] K. L. Xie and L. Kwok, "The effects of Airbnb's price positioning on hotel performance," *Int. J. Hosp. Manag.*, vol. 67, pp. 174–184, 2017, doi: [10.1016/j.ijhm.2017.08.011](https://doi.org/10.1016/j.ijhm.2017.08.011).
- [14] G. Zervas, D. Proserpio, and J. W. Byers, "The rise of the sharing economy: Estimating the impact of Airbnb on the hotel industry," *Boston U. Sch. Manag. Res. Paper*, no. 2013-16, 2016.

- [15] Q. Ke, "Sharing means renting? An entire-marketplace analysis of Airbnb," in *Proc. WebSci'17*, Troy, NY, USA, Jun. 2017, pp. 25–28.
- [16] G. Quattrone et al., "Who benefits from the 'sharing' economy of Airbnb?," in *Proc. WWW'16*, Montréal, Canada, Apr. 2016, pp. 1385–1394, doi: [10.1145/2872427.2874815](https://doi.org/10.1145/2872427.2874815).
- [17] Y.-H. Xu, J.-W. Kim, and L. Pennington-Grey, "Explore the spatial relationship between Airbnb rental and crime," in *Proc. TTRA Grad. Student Workshop*, 2017.
- [18] A. Musthafa, "Karakteristik akomodasi wisata Airbnb di Daerah Istimewa Yogyakarta," M.S. thesis, Fak. Geografi, Univ. Gadjah Mada, Yogyakarta, Indonesia, 2019.
- [19] A. Musthafa, A. Wicaksono, and R. Rijanta, "User Preferences of Airbnb Accommodation Spatially in The Special Region of Yogyakarta, Indonesia," *Jurnal Pembangunan Wilayah dan Kota*, vol. 21, no. 2, pp. 183-197, Jun. 2025. <https://doi.org/10.14710/pwk.v21i2.63651>
- [20] AirDNA, *AirDNA Market Research*, 2018. [Online]. Available: <https://www.airdna.co>. Accessed: Jan. 15, 2018.
- [21] Kompas, "Hadapi Airbnb, ini yang dilakukan pengusaha hotel," *Kompas.com*, Nov. 29, 2017. [Online]. Available: <https://ekonomi.kompas.com/read/2017/11/29/200800026/hadapi-airbnb-ini-yang-dilakukan-pengusaha-hotel>. Accessed: Nov. 30, 2020.
- [22] A. Light and C. Miskelly, "Sharing economy vs sharing cultures? Designing for social, economic and environmental good," *Interact. Des. Archit. J.*, no. 24, pp. 49–62, 2015.