

Implementation of Mid-Rise Housing in Housing Provision in Yogyakarta, Indonesia

Rizkika ZULHIJIANI, Indonesia

Asmita PUSPASARI, Indonesia

Nawang ANANDHINI, Indonesia

Abstract

In 2045, it is projected that 70% of Indonesia's population will live in urban areas that can be multi-defined as existing urban areas that experience growth or peri-urban and villages that will transform into urban areas. A study of 'Missing Middle House (MMH)' refers to mid-rise housing development as a housing solution that balances the landed houses' demands with sustainable urban growth through the implementation of community-oriented living in mid-rise housing. The research depicts several potential middle houses compositions derived from analysis of urban growth patterns, demographic conditions, economic situation, existing familiar housing typologies, and culture in Yogyakarta. Afterwards, best composition(s) will be synthesised through PPP financial schemes simulation to show implementation feasibility. Several methods include qualitative approaches such as literature review, spatial analysis will be used to collect relevant datas. Finally, the final composition with implementation feasibility (spatial and financial scheme) will be revealed and become a significant proposal for future development both by government and private developers.

Keywords

Missing Middle House, public-private partnership, housing provision

1. Introduction

Development Growth in YUA

In the last three decades, Yogyakarta Urbanized Area (YUA) is rapidly expanding from year to year. In 1987, the construction of the outer ring road led to increased urbanisation in the area located between the ring road and the urban agglomeration (Divigalpitiya and Handayani, 2015). Then, in 2000 to 2010, urbanisation in Yogyakarta was indicated by population density, the percentage of non-agricultural households, percentage of built-up land and availability of socio-economic facilities, and population growth (Lasuardi and Muta'ali, 2014). From 2014 to 2018, the area of built land in Yogyakarta Urbanized Area has increased by 251 ha (Wahyuhana, et. al., 2021).

Demography

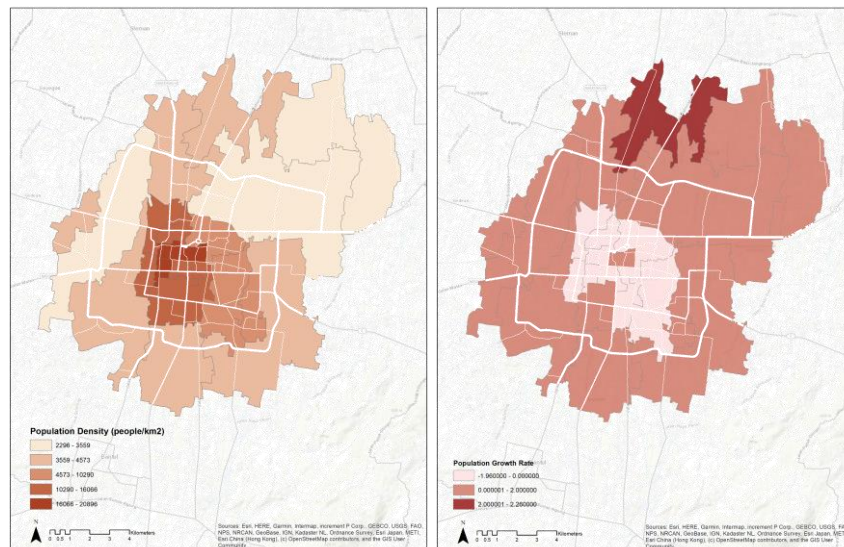


Figure 1. Demographic Condition in YUA

YUA consists of three regency/city, which is Bantul, Sleman and Kota Yogyakarta, inhabited by more than 1 million population, roughly 1.011.048 people in 2022 (BPS, 2023). Kota Yogyakarta that located inside of the ring road is the most dense area based on the population. Meanwhile, from 2010 to 2020, Kota Yogyakarta has the lowest population growth from overall YUA compared to Bantul and Sleman (BPS, 2020). The number of population growth is also influenced by the migration rate. This migration phenomenon actually already happened since 2001, and most of the permanent migrants that came to DIY were students and college students. On the other hand, a lot of migrants do not interest to live in Kota Yogyakarta and they preferred to commute from peri-urban to work in Kota Yogyakarta (Giyarsih, 2001). This means that the tendency of urban growth to peri-urban already happened more than two decades ago.

Economic Patterns and Urban Structure

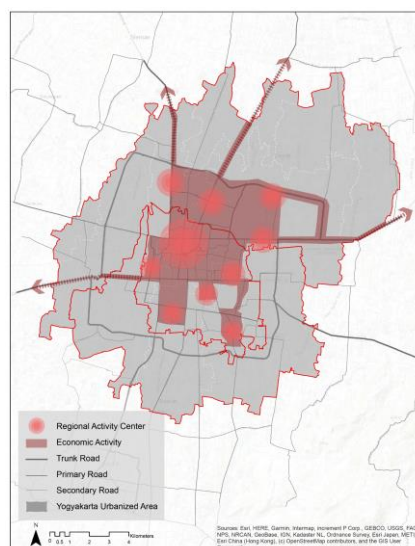


Figure 2. Economic Patterns and Urban Structure in YUA

Rapid urban expansion in YUA results in a change of socio-economic conditions. Peripheral area of YUA experiences shifts from mostly primary sectors (agriculture) to secondary and tertiary sectors, especially trade and services. Specifically, areas inside the trunk road (ring road), that could be defined as city center that have diverse commercial activity from tertiary and quaternary sectors.

In 2018, developed land in YUA increased 1,222 ha from the previous year with various ranging from settlements, offices, and commercial activities (Wahyuhana, et. al., 2021). Given Yogyakarta's branding as a tourism city and educational city, the city's economic activities mainly provide amenities and support for tourists and students. To support the increasing number of tourists visiting Yogyakarta, the development of hotels cumulatively has increased from 2009 to 2020 (Yulianto and Mayasari, 2021). Property development in Yogyakarta also varied with indekos (student dormitory) in order to provide accommodation to students who live temporarily in the city. Although most indekos are managed informally by house owners, there are also exclusive indekos and student apartments that specifically target the student market. Thus, the property market in Yogyakarta, especially vertical housing, is segmented towards students' needs (Dewi, 2020; Tugu Jogja, 2019; Mahrizal, 2014). Yogyakarta also experiences an increasing trend of land use change to commercial areas to accommodate tourism and student activities that resulted in environmental issues, cultural shifts, even gentrification (Hestin, 2016; Nugraha, 2015; Rustanti, 2008).

By its economic pattern, property development in YUA is not only affected by increasing demand for residence, but also commercial property. Yogyakarta is one of the cities that has the highest property price increase index (Kirana, 2022). Property supply index in Yogyakarta has increased significantly from 2021 to 2022, reaching 145,9 as well as its demand has risen from 187,5% in 2021 to 203,4% in 2022 (Rumah, 2022). In Kota Yogyakarta itself, property price preference is dominated with the Rp1,5-Rp4 billion category (33,9%), then followed by Rp300-Rp750 million (Rumah, 2021) category. Compared to the regional minimum wage in Yogyakarta that is around Rp2 million per month, the difference of price preference indicates that the property market is also dominated by people that reside outside Yogyakarta. The distinct buyer characteristics generate competitive access to accessible and affordable property and could further gentrify people who live in the city.

The competitiveness of the property market in Yogyakarta worsened housing backlog issues. In Yogyakarta City the housing backlog reached 87,908 in 2018. (Regional Regulation of Daerah Istimewa Yogyakarta 9/2019). Due to high property prices, housing options are limited especially for low-income communities that reside in urban area. Given the condition aforementioned, this paper is intended to analyse the optimal composition of mid-rise housing in Yogyakarta as one of the solutions to minimise the housing backlog.

2. Methodology

This research examines Yogyakarta characteristics to formulate a middle-housing type that suits its needs. The methodology in this research employs a qualitative approach and is completed with spatial analysis. Qualitative data were collected through literature studies especially related with the housing provision from previous research related to the topic and regulations. Meanwhile, spatial analysis is conducted using GIS-based software and used to show geographical data that is derived from statistical data that is published by the government.

The results of this analysis are then adjusted to the economic and cultural condition of people who live in YUA, until a mid-rise typology that is adapted from the concept of Missing Middle House is tailored to the

conditions of YUA. The outcomes of this study are expected to become a new paradigm for housing provision through the Public-Private Partnership financing scheme, involving both the private sector and the government.

3. Discussion

3.1. Existing House Typologies and Housing Preference in Yogyakarta

Most of houses in Yogyakarta are landed houses with homeownership rights followed by rent and contracts (Regional Regulation of Daerah Istimewa Yogyakarta 9/2019). Housing preferences that lean towards landed houses in Yogyakarta are derived from intrinsic motives and external influence. According to Tang, et. al. (2022) and Lutfiana and Widiyastuti (2021), intrinsically, people's preference in landed houses is influenced by homeownership status, better environment, and comfortness (wider space, no stairs needed, and more privacy).

Meanwhile, the external factor is limited vertical housing supply in Yogyakarta. Vertical housing in Yogyakarta can be categorised as two types, (1) *Rusunawa* (*in english*) that has an image for low-income community and (2) commercial apartment that targets *high-income* people and students from outside Yogyakarta who live temporarily to study.

3.2. Public Perception

This study intends to know public perception, specifically people who live in YUA related to the vertical co-living housing and their preferences on living in this typology. In order to get these preferences, this study uses literature studies from various journals or studies that had been done to be implemented according to the YUA context.

Table 1. Literature study for Public Perception

No.	Literature	Variable		
		Main Variable	Indicator	Parameter
1.	Identification of People Preferences for Settlement in Yogyakarta Urbanized Area (Puspita, Kurniati, and Sujarto, 2020)	Location	Land uses	Areas already built and dominant with the residential and other uses for supporting the urban activity
			Accessibility	Areas have direct access to any location in YUA (urban and suburban, including the city center and commercial center), and to public facilities such as education and health center

2.	Gen Y and Z Preferences for Residential Physical Attributes in Yogyakarta (Ekananda, Nindyah and Marcilia, 2019)	Property characteristics	Physical Attributes	Complete physical attributes such as the house size, private room, number of bedrooms and bathrooms, exterior and interior, green open spaces, parking, materials quality and ability to save more energy, as important features for houses
			Housing Typology	People preferred to live in landed houses than in apartments
3.	Middle-class Millennial Housing Preferences in DKI Jakarta (Asfira, 2021)	Property characteristics and location	Physical Attributes	Millennials preferred to live in a 22-70 sqm apartment with 2 bedrooms and 2 bathrooms, or in a 200-600 sqm parcel for a landed house with the same room features
			Land uses	Most of middle-class millennials preferred to either buy or rent houses outside DKI Jakarta Most of middle-class millennials choose to live in apartments with high accessibility to public facilities and public transportation.
4.	Millennials Preferences in Housing, Case Study : DKI Jakarta, West Jakarta and Yogyakarta (Yustika, Ridlo, and Widyasamratri, 2022)	Property characteristics and location	Physical Attributes	Millennial's lifestyle influences physical attributes such as size, number of rooms, green open spaces, and technology.
			Housing Typology	Most of people preferred to live in landed houses than vertical houses such as apartment

			Accessibility	Most of millennials considered accessibility to highway and public facilities such as health and education for the location of the house
5.	Housing Preferences of Young Adults in Indonesia : Housing Attributes and Consequences (Farasa and Kusuma, 2018)	Property characteristics	Physical Attributes	Green areas and view as attributes that most of young adults have in their houses, while location as the second essential attributes and home design as the third important attributes.
			Consequences	Comfort is the most essential feature that young adults prefer to get in their houses. Comfort in this context is defined in two categories: physical comfort such as greeny, cool, fresh, not fetid and clean; and psychological comfort such as comfortable/not bored, impressed not cramped and provide comfort environment.

Based on the literature above, this study categorised housing preferences to two main variables: location and property characteristics. Sub-categories for location are land uses and accessibility. Most of the people preferred to have houses that were located with a high rate of accessibility to an urban and commercial center or at least have direct access to the linkage that connects their places to the public facilities. Location and housing typology are variables that correspond to each other, most of the people preferred to live in landed housing if the property is located far from the city center, in the other hand, they preferred to rent vertical housing if it is located near the city center.

Property characteristics divide into sub-categories such as physical attributes, housing typology and consequences. Green open space becomes the most essential physical attribute that needs to be featured in people's houses, also with the number of bedrooms and bathrooms that depend on the household size. Most of people in the housing typology category are still preferred to live in landed housing than in vertical housing, but this variable also strongly depends on the location. Consequences are the result of physical attributes or people behaviour which can be benefits or undesirable (Farasa and Kusuma, 2018), most of people hope to feel the comfort in their property, either physical or psychological comfort.

3.3. Contextualizing MMH

Middle Homes is a concept brought by an architect and urban designer of Daniel Parolek to address housing stock that meet market demands in the US. The initial intention is to provide the experience of a single housing unit (private space, garden) while intensifying the population. Middle homes typically look like and have the size of single-family dwelling, but can accommodate multiple households. The benefits of implementing this type of housing are its affordability by design, ability to reduce transportation cost, shared land cost, smart land use that can enable incremental creation and promoting small scale business, and inclusivity of various incomes.

There are several types of middle housing which includes (1) Cottage Court; (2) Side-by-Side Duplex; (3) Stacked Duplex; (4) Fourplex; (5) Sixplex; (6) Eightplex (7) Courtyard; (8) Townhouse; (9) Live/Work. These typologies capture the area and type variation of middle housing with the main characteristic of communal living. However, the study of local perception on housing preferences aspects capture the importance of the sense of ownership, public transportation accessibility, and open spaces (+citation). Thus, these typologies are required to be adapted into the local context of Yogyakarta to synchronise the urban and cultural system.

The preference of public transportation accessible housing location requires a robust transportation system with high investment while the condition of public transportation in Yogyakarta is still classified and needs a huge improvement. Therefore, the implementation of middle housing is encouraged to be done within the city centre to achieve close proximity with the working area. This scheme can be done through adaptation on existing housing within the city centre to allow multiple households living under the same housing by using Sultanate Ground. Next, the preference of open spaces provision close to the house is also possible within the larger area development both within the city centre, or as other strategies for housing developers in making housing clusters in peri-urban areas. The latter condition may act as a tool to give alternative solutions for developers to create higher density housing development with high investment value and at the same time giving the sense of ownership to the potential housing buyers.

Moreover, the implementation of this scheme has the potential to be supported by the government due to the existing regulation of Perda 9/2019. Missing middle homes concept is in line with Yogyakarta Housing Provision Plan (Perda 9/2019) that encourages urban areas to have more vertical residential composition.

Table 2. Directions for Backlog Allocation of Ownership and Land Stock for Urban Settlement Development

City/Regency	Housing Backlog	Vertical housing composition direction (urban)	Landed housing composition direction (rural)	Existing Urban Settlement Land Use	Urban Settlement Land Stock
	<i>unit</i>	%	%	ha	ha
Kota Yogyakarta	87,908	100	0	3,158.40	48.62

Sleman	106,077	65	35	7,341.58	3,477.16
Bantul	42,127	50	50	3.914,03	1,955.37

Source: Regional Regulation of Daerah Istimewa Yogyakarta No. 9 Year 2019.

Considering the strong sense of community and kinship that is prevalent in Yogyakarta, the implementation of MMH with a co-living approach would be highly suitable. Co-living tends a sense of community and social interaction among residents, which aligns well with the cultural values and close-knit nature of the Yogyakarta community. This approach encourages shared spaces and facilities, promoting social engagement and enhancing the overall living experience for the residents.

The diversity of residents in this typology can vary, ranging from singles to those with families. This environment can create a comfortable place to live for multi-generations. The inclusivity allows for a vibrant and interconnected community and enriches the social dynamic. The presence of various generations within co-living can foster mutual learning, support and enhance overall well-being.

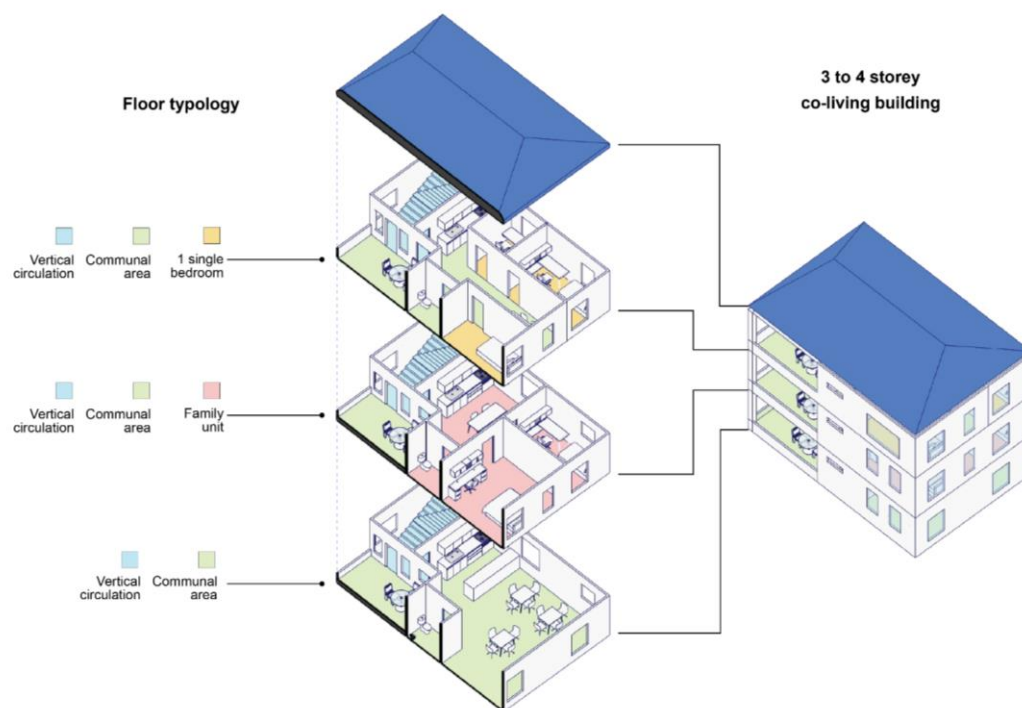




Figure 3. Adaptation of Missing Middle House with Co-Living Concept

3.4. PPP Financial Scheme

Indonesia as a relatively large country that is in line with the number of population, and has a significant responsibility to fulfil the basic infrastructure needs of its people, including housing. Budget allocation for country (APBN) and regional budgets (APBD) in the YUA is considered insufficient to address housing problems. It is necessary to implement strategies in finance for this problem.

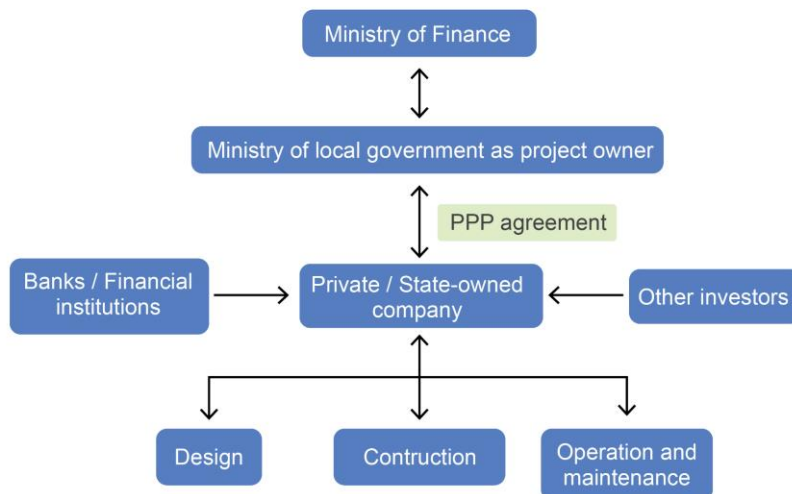


Figure 4. Context PPP in Indonesia. Source : KPBK Kemenkeu

Until today, the government has been familiar with the Public-Private Partnership (PPP) scheme, which involves collaboration between the government and private entities to manage government-owned assets to fulfil public needs. However, the PPP implementation in housing provision is often overlooked due to

the low investment value. This happens mainly caused by the high price of land and construction costs. With the development of the housing provision paradigm, co-living vertical houses required minimum land because the house grows vertically.

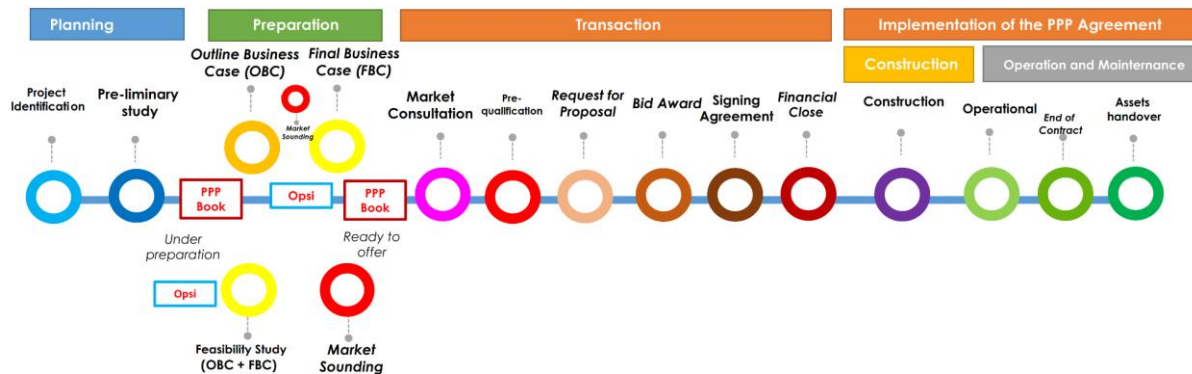


Figure 5. PPP Scheme for Housing Provision. Source : Kementerian Bappenas

Under the PPP framework, the government can provide support such as land allocation (Sultanate Ground) and financial incentives. As Yogyakarta is a former kingdom of the Sultanate of Yogyakarta, the province has a land asset named *sultanate ground*. Sultanate ground is categorised as two types (1) *tanah keprabon* (kroon domein) and (2) *tanah dede keprabon* (rijks domein). *Tanah keprabon* is mainly used for palace affairs and building and only inherited on to each Sultan from one Sultan to the next generation as the legal owner of the Kraton Yogyakarta. Meanwhile, *tanah dede keprabon* can be used or leased to the public. According to the Special Regional Regulation of Daerah Istimewa Yogyakarta No. 1 Year 2017, utilisation and management of sultanate ground is aimed at (a) cultural development; (b) social concerns; or (c) public welfare. Rights or contracts in using this Sultan Ground are regulated and granted by Yogyakarta Sultanate.

As an initial agreement, the government with the private-e.g developer, agreed to develop Sultanate Ground as a co-living housing, that can be sold or rented to people with lower or middle incomes. Units can be sold with the right-to-build certificate or rented the unit with long-term periods ranging from 10 to 20 years. Government plays an important role in controlling the prices at the market that the operator decides. Besides that, the government and the private must have an agreement for the Internal Rate of Return (IRR) based on the feasibility study that has already been conducted. If the IRR does not meet the original target, the government can provide assistance until the revenue generated by the private is equal to the target return that is set in IRR. This scheme is adapted to the PPP Availability Payment.

Construction costs on this housing typology can be minimized because the development can be carried out on a small to medium scale. The buildings, with four floors each, can accommodate strictly only one family per level or accommodates 2 to 4 rooms for singles, and within one cluster, only 2 to 4 buildings. The target market is also diverse that will be able to reach not only families but also individuals who are not yet married.

In this case, the status remains unchanged for assets that have been sold in the form of right-to-build, when the concession period between the government and the private sector expires. However, for individuals or families who are renting, when the concession period ends, the occupants have the option to purchase the unit at a lower price.

4. Conclusion

As a strategy for meeting housing needs in the YUA, MMH typology can be adapted into co-living vertical houses with 3 to 4 storeys. This new housing paradigm can assist the community in residing in a decent environment with reasonably affordable prices. By implementing co-living vertical houses, the limited land can be optimally utilized, creating housing units that can accommodate multiple families or individuals. The vertical design helps reduce land requirements while still providing comfortable living spaces. This new paradigm addresses the housing shortage and promotes a sense of community and social interaction among residents. It offers an opportunity for individuals and families to access housing that meets their needs while maintaining affordability.

To implement this housing typology, the government can collaborate with the private using PPP scheme to efficiently utilize the resources such as Sultanate Ground for future sites development, leading to the creation of well-designed and well-managed co-living spaces that meet the housing demands of the community.

In addition, future studies need to be conducted, particularly regarding the preferences of the community towards this typology concept of co-living. Further research can involve surveys, interviews, or in-depth needs mapping with various community groups in YUA. In such studies, it is important to explore the community's preferences regarding house design, unit size, shared facilities, privacy, spatial needs and other variables that are considered important to them in choosing a place to live. With a more comprehensive understanding of community preferences, the government and developers can deliver housing solutions that better meet their needs and expectations. This is crucial to ensure the implementation of co-living vertical housing is provides maximum benefits to the people.

5. References

- Dewi, F.S. (2020) 'Pengembang di Kota Besar Sasar Mahasiswa, Termasuk di Jogja', *Harian Jogja*, 23 Januari [online]. Available at: <https://ekbis.harianjogja.com/read/2020/01/23/502/1030139/pengembang-di-kota-besar-sasar-mahasiswa-termasuk-di-jogja> (Accessed: 13 July 2023).
- Divigalpitiya, P. and Handayani, K.N. (2015) 'Measuring the Urban Expansion Process of Yogyakarta City in Indonesia', *IRSPSD International*, 3(4) [online]. Available at: https://doi.org/10.14246/irspsd.3.4_18 (Accessed: 09 July 2023).
- Farasa, N. and Kusuma, H.E. (2018) 'Housing Preferences of Young Adults in Indonesia: Housing Attributes and Consequences' *Friendly City 4 From Research to Implementation for Better Sustainability* [online]. Available at: <https://doi.org/10.1088/1755-1315/126/1/012184>.
- Giyarsih, S.R. (2001) 'Gejala Urban Sprawl sebagai Pemicu Proses Densifikasi Permukiman di Daerah Pinggiran Kota (Urban Fringe Area) Kasus Pinggiran Kota Yogyakarta', *Jurnal PWK* 40, 12(01), [online]. Available at <https://journals.itb.ac.id/index.php/jpwk/article/view/4312>.
- Hestin, M. (2016). Tipologi Perubahan Fungsi Lahan Bangunan Di Perkotaan Studi Kasus Perkembangan Bangunan Komersial Penggal Jalan Monjali – Jalan Abu Bakar Ali Yogyakarta. Thesis. Universitas Teknologi Yogyakarta.
- Kirana. (2022) 'The rate of return on property investment in Indonesia can reach 35%', News of *Universitas Gadjah Mada Faculty Of Economics And Business*, 24 October [online]. Available at: <https://feb.ugm.ac.id/en/news/3858-the-rate-of-return-on-property-investment-in-indonesia-can-reach-35> (Accessed: 13 July 2023).

Lasuardi, A. L., and Muta'Ali, L. (2014) 'Dinamika Spasial Proses Urbanisasi Perkotaan YOGYAKARTA Tahun 2000-2010', *Jurnal Bumi Indonesia* 3(4) [online]. Available at: <https://www.neliti.com/publications/228640/dinamika-spasial-proses-urbanisasi-perkotaan-yogyakarta-tahun-2000-2010> (Accessed: 08 July 2023).

Lutfiana, F. and Widiyastuti, D.(2022) 'People's Preference for Rusunawa Jogoyudan as a Residential Option', *IOP Conference Series: Earth and Environmental Science* [online]. Available at: <https://doi.org/10.1088/1755-1315/1039/1/012061> (Accessed: 10 July 2023).

Mahrizal, V. (2014) 'Pengembang Berebut Pasar Apartemen Mahasiswa Di Yogya', *Tribun News Yogyakarta*, 17 March [online]. Available at: <https://jogja.tribunnews.com/2014/03/17/pengembang-berebut-pasar-apartemen-di-yogya/> (Accessed: 13 July 2023).

Nugraha, A.A. (2015) Perkembangan Ruang Komersial di Kawasan Jeron Beteng Kota Yogyakarta (Studi Kasus: Jalan Wijilan, Jalan Ngasem, dan Jalan Rotowijayan). Thesis. Universitas Gadjah Mada.

Puspita, I.Y., Kurniati, A.C., Sujarto, D. (2020) 'Identifikasi Preferensi Bermukim Masyarakat di Kawasan Perkotaan Yogyakarta (KPY)', *Matra*, 1(1) [online]. Available at: <https://journal.itny.ac.id/index.php/matra/article/view/831>.

Regional Regulation of Daerah Istimewa Yogyakarta No. 9 Year 2019.

Rumah (2022) *Tren Pasar Properti Di Yogyakarta Q1 2022 Dan 8 Rekomendasi Propertinya*. Available at: <https://www.rumah.com/areainsider/daerah-istimewa-yogyakarta/article/tren-pasar-properti-di-yogyakarta-14576> (Accessed: 11 July 2020).

Rumah (2021) *Prospek Investasi Rumah Di Kota Jogja Yang Istimewa*. Available at: <https://www.rumah.com/areainsider/daerah-istimewa-yogyakarta/article/rumah-di-kota-jogja-13542> (Accessed: 11 July 2020).

Rustanti. (2008) Perkembangan kawasan Umbulharjo sebagai kawasan tumbuh cepat di Kota Yogyakarta. Thesis. Universitas Gadjah Mada.

Special Regional Regulation of Daerah Istimewa Yogyakarta No. 1 Year 2017.

Wahyuhana, R.T., Putri, H.A., and Hidayat, R. (2021) 'Spatial Development and Economic Competitiveness of Yogyakarta Urban Area', *Proceedings of the 2nd Borobudur International Symposium on Science and Technology (BIS-STE 2020)* [online]. Available at: <https://doi.org/10.2991/aer.k.210810.086> (Accessed: 11 July 2023).

Wibowo. (-) 'Meningkatkan kualitas APBN dengan Skema KPBU' *KPBU Kemenkeu Republik Indonesia*, - [online]. Available at : <https://kpbu.kemenkeu.go.id/read/67-208/umum/kajian-opini-publik/meningkatkan-kualitas-apbn-dengan-skema-kpbu> (Accessed : 15 July 2023).

Yulianto, A. and Mayasari, C.U.. (2021) 'Preferensi dalam Memilih Hunian Menapak dan Vertikal oleh Generasi Y dan Z di Indonesia', *Review of Urbanism and Architectural Studies*, 20(1) [online]. Available at: <https://ejournal.bsi.ac.id/ejurnal/index.php/jp/article/view/11454> (Accessed: 14 July 2023).

Yustika, F.P., Ridlo, M.A., Widyasamratri. (2022) 'Preferensi Generasi Milenial dalam Memilih Hunian Studi Kasus : DKI Jakarta, Jakarta Barat dan Yogyakarta' *Jurnal Kajian Ruang* [online]. Available at: <http://jurnal.unissula.ac.id/index.php/kr>

Tang, A., Kusuma, H.E., Riska, A.S. (2022) 'Measuring the Urban Expansion Process of Yogyakarta City in Indonesia', *IRSPSD International*, 3(4) [online]. Available at: <https://doi.org/10.21776/ub.ruas.2022.020.01.9> (Accessed: 10 July 2023).

Tugu Jogja. (2019) 'Alasan Pengembang Mulai Bidik Bisnis Apartemen di Yogyakarta', *Kumparan*, 25 April [online]. Available at: <https://kumparan.com/tugujogja/alasan-pengembang-mulai-bidik-bisnis-apartemen-di-yogyakarta-1qxPBGpHlrn/full> (Accessed: 13 July 2023).