International Journal of Architecture and Urbanism Vol. 09, No. 01 (2025) 12 – 24

International Journal of Architecture and Urbanism

Journal homepage: https://talenta.usu.ac.id/ijau

The Influence of Vertical Housing Development on the Spatial Structure in Medan Petisah District

Nabilah Khoirina*[1]

[1]*PT. Makmur Dekorindo Lestari, The Ap Group, Gatot Subroto Street No. 180-180E, Medan Petisah, Medan City, North Sumatra, 20118, Indonesia*

*Corresponding Author: Nabilahkhoirina@gmail.com

ARTICLE INFO

Article history:
Received 18-11-2024
Revised 5-3-2025
Accepted 14-3-2025
Available online 31-03-2025

E-ISSN: 2622-1640
P-ISSN: 2622-0008

How to cite:
Khoirina N. The Influence of Vertical Housing Development on the Spatial Structure in Medan Petisah District. International Journal of Architecture and Urbanism. 2025. 9(1):12-24.

http://doi.org 10.32734/ijau.v9i1.18857

ABSTRACT

Medan Petisah is one of 21 sub-districts in Medan City, North Sumatra Province, Indonesia. The area of Medan Petisah Sub-district is 4.61 km2. Petisah Tengah Village is the largest sub-district in Medan Petisah Sub-district with an area of 1.27 km2. In 2020, Medan Petisah Sub-district had a population of 71,844 people. Its area is 6.82 km² and its population density is 10,534 people/km². Meanwhile, in 2021, the population of this sub-district was 74,782 people. vertical housing is a multi-storey building built in an environment, which is divided into parts that are functionally structured in a vertical direction and are units that can each be owned and used separately, especially for housing. Vertical housing itself is built to solve the problem of limited land so that it can be used by more people to live. The methods used in this study are field observation, interviews and discussions with the community. Field observations and interviews were conducted for 2 weeks in Medan Petisah District. Vertical housing, such as apartments or condominiums, is often considered a solution to overcome land limitations in big cities. Vertical Housing in Medan Petisah Has Significant Differences with other cities, especially developed cities in Indonesia. The impact of vertical housing can be distinguished between short-term and long-term, depending on various social, economic, environmental, and urban development aspects.

Keywords: influence, space structure, vertical building.

1 Introduction

According to history, Medan Petisah District began with an ice factory on S. Parman Street under the name "Sari Petojo Es" in the 1960s, producing ice bars (ice blocks) packaged in crates. As time went by, people at that time called it "Peti Basah" so it changed to "Petisah". The basis for the formation of the Medan Petisah District is Government Regulation Number 50 of 1991 dated 07 September 1991 concerning the Establishment of Several Districts in North Sumatra, Including 8 (eight) Expansion Districts in the Level II Medan Municipality of Medan. The Medan Petisah District Head's Office was inaugurated on September 2 1992 by the Governor of North Sumatra Raja Inal Siregar, where the Medan Petisah District area was previously part of the Medan Baru District and the West Medan District [1] (Figure 1).

Figure 1. Medan Petisah Area

Source: Topography of Medan Government [2].

This study is a point of investigation regarding the rapid growth of vertical housing in Medan Petisah District which has an impact on the city's spatial structure. This area is a large area and rich in culture. The rapid growth of vertical housing in building a more organized urban spatial structure can build a better city with limited land in the Medan Petisah sub-district. Vertical Housing is the answer to the dense population that continues to grow in the Medan Petisah area. This is because Medan Petisah is a strategic area which is very close to Medan City Center.

In 2020, Medan Petisah sub-district had a population of 71,844 people. The population density is 10,534 persons/km², and the area is 6.82 km². In the meantime, this subdistrict will have 74,782 residents in 2021. As one of Medan City's subdistricts, the ethnic population in this sub-district is quite diverse. Deli Malay, Batak, Chinese, and Javanese are the most numerous ethnic groups in this sub-district. Apart from that, there are also other tribes such as Minang, Aceh, Sundanese, Indian, Nias, Pesisir, Bugis, and others. The population of the Medan Petisah sub-district is extremely religiously varied, according to data from the Ministry of Home Affairs for 2020. The percentage of the population of Medan Petisah sub-district based on religion is 46.65% who embrace Islam, then Christians as much as 28.79%, where Protestants are 26.10% and Catholics are 2.69%. Followers of Buddhism are 22.42%, Hindus 2.13% and a small number of others are Confucians and other beliefs 0.01%. For places of worship, there are 35 mosques, 33 churches, and 17 monasteries [3].

The development of vertical housing in Medan Petisah has experienced a significant increase in the last few decades. This phenomenon is related to population growth, rapid urbanization, and limited land in urban areas. Urbanization continues to grow causing an increase in the need for housing in big cities. Limited land encourages the construction of vertical housing, such as apartments and condominiums, as a solution to overcome space limitations. Vertical housing allows for more efficient use of land, especially in dense urban areas. By building multi-storey buildings, more people can live in the same area without needing a lot of land.

Vertical Housing is on the rise, especially among millennials and young professionals who are looking for greater comfort and accessibility. Apartments and condos are often considered more practical and offer a variety of modern amenities, such as 24-hour security, swimming pools, fitness centers, and other shared spaces.

Vertical housing can be defined as preliminary statements or conjectures submitted to test, regarding the impacts, benefits, or challenges associated with the development and desirability of vertical housing, such as apartments or condominiums. This hypothesis can be related to various aspects. Vertical Housing can have a significant impact on the spatial structure of cities and land efficiency. Such as more efficient land use, reducing horizontal expansion in a city, especially in Medan Petisah. So it can change the spatial structure of the city because the city becomes denser. This can reduce urban sprawl and create a limited concentration of economic, social and cultural activities in the area. However, demand for facilities such as schools, hospitals and green open spaces tends to increase in dense areas. So the city government needs to plan the distribution of these facilities well in order to meet the needs of the growing population in vertical residential areas.

Economic development in the industrial sector has experienced quite rapid growth, especially in the city of Medan. These industrial sectors require workers to carry out these jobs. This provides an impact on the community of adequate housing to meet the need for housing for these industrial workers. One of the three fundamental human needs clothing, shelter, and food is the shelter. "Every individual has the right to a pleasant and healthy living environment, to be prosperous both physically and spiritually, and to obtain health care." Therefore, residence means a place to live that is suitable for humans to support daily activities. The growth of large cities is directly related to the increase in the number of city residents and their activities. This causes an increase in the need for land use for productive city functions such as housing, business, trade, services, and offices [4]. To meet community needs, buildings are very important because they function as facilities and infrastructure. However, due to limited land availability and high land prices, horizontal building construction is not always possible; vertical building design is the only alternative [5].

One of the things that every regional administration, particularly the city of Medan, must do is to meet the housing demands of workers. One of the constraining factors in meeting housing needs is considerations related to land. In practice in the field, there is a lot of empty land in strategic areas that is used by large developers to be used as investment land and not as residential land for the community. Therefore, fulfilling housing for people with limited land constraints is through providing vertical housing in the form of rental flats for industrial workers. Vertical housing is a residential spatial planning concept that is built vertically and has stacked floors to overcome land limitations in urban areas. This building concept is generally applied to designing hotels and apartments. There are three main aspects in providing adequate housing for the community, namely supply, demand, and need. Therefore, people have the right to obtain adequate housing, not only in terms of the quantity of users but also in terms of the quality of the housing [6].

Meeting the housing needs of workers is one of the responsibilities of every regional administration, but especially of the city of Medan (Figure 2). Taking into account limited land, the vertical housing in question is flats for industrial workers. There are many flats built by the Medan city government, as housing for industrial workers and people with regional minimum income or UMR [7]. However, in planning and construction practices, flats built by the government are built without consideration of the user side such as dimensions, number, and activities. Therefore, in the planning process, you must pay attention to the function of the space within it. In general, vertical housing has the function of meeting the housing needs in urban areas which are increasing along with population growth and the rapid industrial economy.

Figure 2. Vertical Building in Medan Petisah District

Source: Google Maps [8].

2 Method

A comparative analysis of scholarly works addressing apartments and their drawbacks forms the basis of the vertical housing hypothesis [9]. The development of the vertical housing concept [10]. This research uses a descriptive method of systems and sub-systems in vertical housing, developed from a function system, value system, and form system. By presenting existing phenomena in a detailed descriptive manner and also paying attention to their quality, characteristics, and relevance. This research is based on data from journals, scientific works, websites, and mass media reports. This study analyzes various studies and sources. This was done to prove the hypothesis that the influence of vertical buildings on the structure of city space is very important for the continuity of community activities and comfort in the city of Medan.

The methods used in this study are field observation, interviews and discussions with the community. Field observations and interviews were conducted for 1 week in Medan Petisah District, to obtain data on the physical conditions of the environment. The results of field observations and interviews will be used to analyze the influence of spatial structure on vertical housing. Analysis of vertical housing in Medan Petisah District uses the Area Identification Guidelines for the spatial structure of Medan Petisah City. Discussions with the community were conducted in 2024 to obtain data on the current residential conditions of residents which were continued with analysis. The results of the analysis are used to determine the influence of Vertical Housing on the Spatial Structure of Medan Petisah City.

3 Results and Discussion

3.1 Future Housing Trends

The current vertical housing system, although still leaving many problems, but its existence is a demand in the future, which cannot be avoided, especially in urban areas, in response to the increasing population growth. Based on BPS data, more than 50% of the Indonesian population after 2012 lived in urban areas. The development of cities is very rapid, the agglomeration of cities in a horizontal direction has resulted in the conversion of productive land. The development of cities in a horizontal direction makes city life inefficient, in addition to the distance factor from one destination to another which is further, the consumption of natural resources needed will be greater to carry out activities in such a city [11].

The inefficiency of urban development causes environmental damage, because cities consume natural resources, during construction and operation. The natural resources needed by cities include energy, water,

and food, conversely, cities also produce waste, in the form of garbage, pollution, emissions, dirty water, etc. The global impact that is currently being felt is global warming, which has caused the earth's temperature to increase, within a period of 100 years from 1888 to 1988 it has increased by 40 C. For this reason, horizontal urban growth must be stopped immediately, and instead, it is done by carrying out space efficiency and utilizing air space to accommodate city activities [12]. A more compact residential area (compact city) is a demand for housing in urban areas, various city problems, demanding changes in the behavior of city people, which are simpler and more efficient. However, how to position city problems that have consequences for the housing system, where on the one hand city life has changed the community's life system a lot, and tends to reduce the human values that have been upheld. We need to return to the idea of how 23 humans interpret their lives, and how humans as social beings must be able to respond to changes in the social system. In an attempt to address global issues, social transformation must be implemented to guarantee the sustainability of the built and natural environments [13].

Law No. 16 of 1985 states that vertical housing is a multi-storey building built in an environment, which is divided into parts that are functionally structured in a vertical direction and are units that can each be owned and used separately, especially for residential areas. Vertical housing itself is built to solve the problem of limited land so that it can be used by more people to live (Figure 3).

Figure 3. Vertical Building in Medan Petisah District

Source: Google Maps [8].

3.2 Vertical Housing Standards

Standart Hunian Vertikal (Vertical Housing Standards) refers to the criteria and regulations set for the design, construction, and management of vertical housing units, such as apartment buildings, condominiums, or high-rise residential complexes. These standards are essential for ensuring that such buildings provide safe, comfortable, and livable spaces for residents. In Indonesia, where vertical housing has become increasingly popular due to urbanization and limited land availability, various regulations and guidelines apply. The residential system is seen as a place that has the function of accommodating the life activities of a family so that it can carry out human life and livelihood in a complete and essential way, apart from the existence of space limited by walls, floors, and roofs (form – structure) as well as the values (meanings – habits) contained therein [14].

Building Safety and Structural Integrity Seismic Safety, Building designs must account for earthquake resistance, especially in areas prone to seismic activity. Fire Safety The inclusion of fire escape routes, sprinkler systems, fire alarms, and other safety measures. Elevators and Access Adequate provision of elevators for accessibility, especially in high-rise buildings. Space Planning/Minimum Unit Size Guidelines on the minimum living space required per unit to ensure comfort, including considerations for the number of bedrooms and living areas. Ventilation and Lighting Proper natural ventilation, lighting, and air circulation

systems to ensure a healthy living environment. Shared Facilities: Standards for communal areas such as lobbies, hallways, parking, and recreational facilities like gyms or swimming pools.

Environmental Considerations Energy Efficiency Incorporating energy-efficient technologies and systems, such as solar panels, efficient lighting, and energy-saving appliances. Water Management Guidelines for water conservation and the use of rainwater harvesting systems. Legal and Regulatory Aspects Zoning and Land Use Vertical housing development must comply with local zoning regulations and land use policies to ensure compatibility with the surrounding area. Ownership and Strata Title: Regulations regarding the ownership of individual units in a building.

Accessibility and Inclusivity Universal Design Ensuring that the building is accessible to people with disabilities, with ramps, elevators, and properly designed restrooms. Public Transportation Access Ensuring proximity to public transportation hubs and pedestrian-friendly pathways. Quality of Life for Residents Privacy and Noise Control Standards for noise insulation and separation between units to ensure privacy and minimize disturbances between residents. Waste Management Proper waste disposal systems and recycling programs to maintain hygiene and environmental responsibility. Sustainability Green Building Certifications: Encouragement or requirement to meet green building standards such as LEED or other sustainability certifications. Landscaping Inclusion of green spaces or gardens within the building complex or surrounding area to improve air quality and aesthetics.

These standards are generally set by governmental authorities, urban planning bodies, and industry organizations. They are designed to enhance the quality of life for residents and ensure that vertical housing developments contribute positively to urban environments.

3.3 The influence of vertical housing on spatial structure

Vertical housing can overcome land efficiency which is one of the main advantages of vertical housing. Vertical housing can maximize the use of limited land by building upwards, not sideways. Vertical housing can be a solution to overcome limited land in urban areas, and can be a practical choice for those who want to live close to work, public facilities, educational institutions and other activity centers. Apart from land efficiency, vertical housing also has several other advantages, such as complete and modern facilities, strategic location, guaranteed security, easy care and maintenance. Vertical housing is very efficient in land use because it optimizes vertical space, allowing more people to live in a limited area. This reduces the need for horizontal urban expansion, reduces pressure on agricultural land and green open spaces, and increases efficiency in the use of infrastructure and public facilities. However, this efficiency needs to be balanced with careful planning so that the quality of life of the residents is maintained (Figure 4).

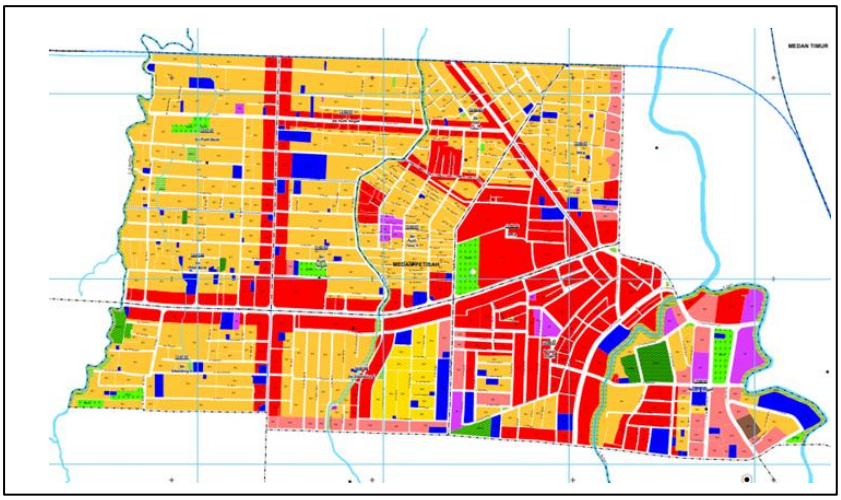


Figure 4. Building typology in Medan Petisah District

Source: RDTA Kota Medan Petisah [15].

Vertical housing has significant socio-economic implications, both positive and negative. On the one hand, it can increase land use efficiency, reduce transportation costs, and improve access to facilities and services. However, on the other hand, vertical housing can also exacerbate social inequality, create price pressure in the

property market, and affect the quality of life of residents. Careful planning and inclusive policies are needed to maximize the social and economic benefits of vertical housing development. In terms of social and economic dynamics, vertical housing can create different social segments. For example, luxury apartments and condominiums may target the upper class, while more affordable units are more likely to be occupied by the lower middle class. This can exacerbate social inequality and create a gap between the upper and lower classes in terms of access to facilities and quality of life. Vertical housing development in previously underdeveloped areas can encourage the gentrification process. This occurs when regional development brings increased rental prices and property values, leading less well-off native residents to move to more distant or cheaper locations.

Vertical Housing also impacts the quality of life, although vertical housing is more efficient, many residents may feel limited in terms of personal space due to high density. This can impact quality of life, especially for larger families or those seeking more privacy. And vertical housing is often limited in terms of green open space or outdoor recreation facilities. This can affect the quality of life of residents if the public space around vertical housing is inadequate.

Even though access to housing is more affordable, the price per unit of vertical housing is higher than landed houses, with high density, the cost per square meter can be more efficient. This allows more people, especially in big cities with limited land, to have access to more affordable housing compared to buying a house in a larger area. For the lower middle class Vertical housing is often marketed to the lower middle class and people looking for housing in the city center. This opens up opportunities for people who cannot afford to buy landed houses in larger areas or on the outskirts of the city.

3.4 The difference between short-term and long-term impacts of vertical housing

Vertical housing, such as apartments or condominiums, is often considered a solution to overcome land constraints in big cities. The impacts of vertical housing can be distinguished between short-term and long-term, depending on various social, economic, environmental, and urban development aspects (Figure 5).

(a) (b)

Figure 5. (a) cambridge apartment in medan petisah; (b) puri orchard apartment in jakarta.

Source: Google Maps [8].

Short Term Impacts of Vertical Housing:

Vertical housing has significant short-term impacts, including a drastic increase in population density in a limited area, which can affect quality of life if infrastructure is inadequate. In addition, the construction of vertical housing requires adjustments to public services such as waste disposal systems, water supply, and electricity, which can cause disruptions or shortages of basic services until new infrastructure is adjusted or built. Land prices and rents around the site can also increase in a short period of time, putting economic pressure on existing residents and affecting their purchasing power. Social disturbances such as noise, congestion, and air pollution can also increase as soon as new residents move in. However, the construction of vertical housing also creates temporary jobs in the construction sector, providing a positive short-term economic impact.

Long-Term Impacts of Vertical Housing:

Vertical housing in the long term brings significant changes to the urban landscape. First, accessibility and mobility increase, especially if the housing is integrated with the city center or public transportation network, reducing the need for long-distance travel and congestion. Second, infrastructure and public facilities such as roads, parks, health facilities, and education experience improved quality along with the development of the area. Third, there is a shift in lifestyle towards a more practical and connected urban area, although it has the potential to trigger social polarization between residents of vertical and non-vertical housing. Fourth, vertical housing has the potential to reduce horizontal expansion of the city, maintain agricultural land and forests, and create green open spaces. However, fifth, property management and maintenance are challenging, with high costs that can burden residents if not managed properly, potentially reducing building quality and comfort.

Comparison of Short-Term and Long-Term Impacts:

The comparison table of short-term and long-term impacts provides a comprehensive picture of the changes caused by vertical housing. In the short term, the impacts that emerge tend to be immediate and can be felt in a short time, such as increased population density, disruption of public services, fluctuations in property prices, social changes due to new arrivals, and the creation of temporary jobs in the construction sector.

Meanwhile, the long-term impacts include more profound and sustainable changes. These include increased accessibility and mobility that facilitate population movement, improved quality of infrastructure and public facilities that support daily life, changes in people's lifestyles that are more urban and connected, potential improvements in environmental quality through land conservation, and challenges in sustainable property maintenance and management (Table 1).

Table 1. Comparison of Short-Term and Long-Term Impacts.

Impact	Short-term	Long-term
Population Density	Increased density around the area.	More even and focused arrangement on field strategy.
Public Services	Disruption or lack of infrastructure and services.	Improved quality of infrastructure and services.
Property Prices	Increased property prices and cost of living.	Stabilization of property prices and values.
Environment and Noise	Disturbance from temporary developmet and pollution.	A more orderly environment with green spaces.
Local Economy	Temporary job creation from development.	Sustainable economic growth from commercial activities and public facilities.
Healthy Lifestyle	Temporary changes related to amenities and quality of life.	Formation of a more integrated urban community.

Overall, the impact of vertical housing can be seen immediately after construction, but the long-term benefits are often more significant in shaping more sustainable urban development and improving the quality of life of its residents.

3.5 Implications of vertical housing for urban planning policy and socio-economic justice

Vertical housing brings a number of implications for urban planning policy and socio-economic justice, which need to be considered by policy makers and related parties so that its impact can be optimally utilized for the advancement of society. Here is a more detailed analysis of these implications:

Implications for Urban Planning Policy:

Vertical housing development requires the implementation of comprehensive urban planning policies. First, land management must be more efficient by encouraging vertical development in strategic locations that are integrated with public transportation, reducing urban sprawl that damages the environment. Second, improving the quality of infrastructure such as transportation, air, waste, health, and education must be a priority to support vertical housing. Third, zoning and spatial planning need to be redefined to accommodate high-rise development, while still considering the ecological ecosystem and quality of life. Fourth, integrated planning between vertical development, transportation, waste management, and public space is essential to avoid new problems such as congestion and lack of social interaction. Finally, policies must focus on reducing urban sprawl by promoting vertical placement in strategic locations, reducing negative impacts such as environmental damage and dependence on private vehicles.

Implications for Socio-Economic Justice:

In the context of socio-economic justice, vertical housing development raises the need to pay attention. First, access to affordable housing is a central issue, considering that the price of vertical housing in big cities often exceeds the ability of low and middle-class people. Therefore, government policy must be proactive in providing social or affordable housing in vertical housing projects. Second, the potential for social segregation due to differences in the economic capabilities of residents needs to be anticipated through inclusive urban planning, creating various types of housing in one area. Third, the quality of life of residents must be improved evenly, by ensuring equal access to public facilities, employment, and public services, regardless of economic status. Fourth, the gap in infrastructure and access to public services between areas needs to be addressed through fair distribution, avoiding discrimination against low-income areas. Fifth, vertical housing can be a driving force for the local economy by creating jobs in the construction, property, and service sectors, especially if integrated with commercial areas. Finally, education and community participation in urban planning are essential to ensure that the resulting policies reflect the principles of justice and poverty.

3.6 Vertical Housing Trends in Medan Petisah with Other Cities

Vertical housing in Medan Petisah and vertical housing in other cities, especially in Jakarta, can be seen from various aspects, such as property market developments, city planning policies, housing prices, and their impact on society. Here is an in-depth comparison between the cities (Table 2).

Table 2. Comparison of vertical housing in Medan Petidah with other cities.

Differences Based on Aspects of Vertical Housing	Medan Petisah	Other Cities (Especially Jakarta)
Context and Development of Vertical Housing	1. Medan Petisah, has a population of more than 7000 people. Although vertical housing has started to develop in recent years, Medan Petisah still has some horizontal housing such as landed houses and clusters.	1. Jakarta, as the nation's capital, has a population of more than 10 million people with a very dense area. Vertical housing in Jakarta has grown rapidly over the past few decades as a solution to overcome land constraints and urban sprawl.
	2. Vertical housing in Medan Petisah generally develops in the city center and strategic areas, but the scale of vertical development is	2. Jakarta has a variety of vertical housing options including luxury apartments, condominiums, and flats (rusun). The development of vertical

Differences Based on Aspects of Vertical Housing	Medan Petisah	Other Cities (Especially Jakarta)
	relatively smaller compared to Jakarta. 3. Most vertical housing in Medan Petisah tends to be aimed at the upper middle class and urban working class who are looking for more efficient housing in areas close to business centers.	housing in Jakarta is more massive and widespread in the city center, business districts, and areas connected to public transportation (eg MRT, LRT). 3. Jakarta also prioritizes the development of vertical housing for various segments, from the upper to middle and lower classes, with various price types.
Price and Accessibility of Vertical Housing	1. The price of vertical housing in Medan Petisah is relatively more affordable compared to Jakarta. Although the price of vertical housing in Medan Petisah has increased, the overall cost of living in Medan is still lower, making the price of vertical housing more competitive. 2. The accessibility of vertical housing in Medan Petisah is more limited, with many residents preferring horizontal housing in the suburbs which is cheaper and more in line with their lifestyle.	1. The price of vertical housing in Jakarta varies greatly, depending on the location and class of housing. In the central business district and areas with good transportation access, apartment prices can be very high. Meanwhile, vertical housing for the lower middle class, such as rusun, is more affordable and supported by government policies. 2. The accessibility of vertical housing in Jakarta is easier for those looking for housing with a strategic location and access to public facilities. However, high prices are still a barrier for most low-income residents.
Infrastructure and Supporting Facilities	1. The infrastructure in Medan Petisah is still developing and is not yet on par with Jakarta in terms of mass transportation. Although there are several supporting facilities, such as shopping centers and hospitals, many vertical housing in Medan Petisah are not fully integrated with public transportation. 2. The development of vertical housing in Medan Petisah usually relies more on private vehicles and does not prioritize public transportation facilities.	1. Jakarta has more advanced transportation infrastructure, such as the MRT, LRT, and Transjakarta networks. Many vertical housing in Jakarta are built around areas that are directly connected to public transportation, allowing residents to easily access city facilities. 2. In addition, Jakarta has more public facilities and entertainment around vertical housing areas, such as malls, hospitals, and schools, which add to the appeal for residents.
Social and Environmental Challenges	1. The main challenges in Medan Petisah related to vertical housing are access to public facilities and the availability of affordable housing. Although there is demand	1. Jakarta faces major challenges related to traffic congestion, air pollution, and flooding, which can impact the quality of life of vertical housing residents. In some areas, high population density in
	for vertical housing, most residents still choose more affordable horizontal housing.	vertical housing can add to these problems.

Differences Based on Aspects of Vertical Housing	Medan Petisah	Other Cities (Especially Jakarta)
	2. In addition, although vertical housing can reduce horizontal urban expansion, there are still challenges in balancing vertical development and environmental sustainability in Medan Petisah.	2. However, the development of vertical housing in Jakarta is more directed at supporting the concept of a sustainable city, with facilities such as green open spaces, waste management, and better rainwater management.
Diversity of Vertical Housing Types	1. Vertical housing in Medan Petisah tends to be more limited to the middle to upper types, with some developers focusing on the premium market. There are also vertical housing projects for the middle class, but the number is less compared to Jakarta. 2. Apartments and condominiums in Medan are generally smaller and simpler than in Jakarta, because the demand for vertical housing is lower.	1. Jakarta offers a wider choice of vertical housing types, from luxury apartments to low-income flats. Vertical development in Jakarta also includes apartments of various sizes, from studios to larger ones for families. 2. Jakarta has more vertical housing projects built by large developers, with various concepts and facilities, including swimming pools, gyms, and high-level security systems.

4 Conclusion

The development of vertical housing in Medan Petisah has experienced a significant increase in the last few decades. This phenomenon is inseparable from population growth, rapid urbanization, and limited land in urban areas. The continuing growth of urbanization has increased the need for housing in big cities. Vertical housing is a multi-storey building built in an environment, which is divided into parts that are functionally structured in a vertical direction and are units that can each be owned and used separately, especially for housing. Overall, the impact of vertical housing can be seen immediately after construction, but the long-term benefits are often more significant in shaping more sustainable urban development and improving the quality of life of its residents. Vertical housing has a major impact on urban planning policies and socio-economic justice. Effective policies must be able to manage denser urban growth in a way that not only pays attention to land and infrastructure efficiency, but also ensures social justice and equal opportunities for all levels of society. Vertical housing can be a solution to the problem of limited land in big cities, while ensuring access to decent and affordable housing for all. Vertical housing in Medan Petisah city has significant differences from other cities that are more advanced in the development of vertical housing, both in terms of development scale, accessibility, price, and supporting infrastructure, although price and congestion are major challenges. Meanwhile, Medan Petisah is still developing in terms of vertical housing, with more affordable prices but more limited vertical housing options and infrastructure that is still developing. The development of vertical housing in both cities must pay attention to socio-economic justice and environmental sustainability, with an approach that is in accordance with the needs and characteristics of each city. It is hoped that this research in the future can further explore community satisfaction and sustainability, steps in the development of vertical housing with proper planning.

5 Acknowledgment

This research is a study of the Influence of Vertical Housing on Spatial Structure focusing on Medan Petisah District which aims to create vertical housing due to limited land that is already dense in order to create open spaces even with limited land. The author would like to thank PT. Makmur Dekorindo Lestari, The Ap Group. And the Department of Architecture, Faculty of Engineering, University of North Sumatra, and all parties who

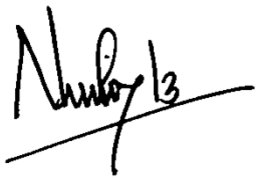
have assisted in the research on the influence of vertical housing on spatial structure focusing on Medan Petisah District.

6 Conflict of Interest

The authors whose names are listed below certify that the manuscript does not have a conflict of interest.

Nabilah Khoirina

This statement is signed by all the authors to indicate agreement that the above information is true and correct (a photocopy of this form may be used if there are more than 10 authors):

Author's name (typed)	Author's signature
Nabilah Khoirina	

References

[1] PEMKO Medan Petisah, 2024.

[2] Topografi Pemerintah Medan Petisah, 2023.

[3] A. A. Cahya, "Kecamatan Medan Petisah Dalam Angka 2022," Badan Pusat Statistik Kota Medan, 2022, p. 3.

[4] Christina, E., dan Rangkuty, G. I. U., "Co-Housing: A Solution Toward Sustainable Settlement in Batam City. Journal of Architectural Research and Education," *Journal of Architectural Research and Education,* vol. 2, no. 4, pp. 101-114, 2022.

[5] Laloan, Y.R.Y., Prijadi, Moniaga, "Apartemen Di Manado Penerapan Konsep Vertical Garden," *Daseng: Jurnal Arsitektur,* vol. 4, no. 2, pp. 10-18, 2015.

[6] Rully, "Merencanakan Dan Merancang Rumah Tinggal Yang Optimal," *Teknik Sipil dan Arsitektur,* vol. 15, no. 19, 2014.

[7] Murtiono, H., Sari, S., & Pandelaki, E. E. , "Peran Hunian Vertikal Sebagai Solusi Terhadap Kawasan Kumuh Di Kota Batam Kepulauan Riau," *Jurnal Arsitektur ARCADE,* vol. 4, no. 1, pp. 47-51, 2020.

[8] "Google Maps," [Online]. Available: https://maps.google.com/web/search/Kecamatan+Medan+Petisah,+Jl+Gelas,+The+Prima+Apartement. [Diakses 12 November 2024].

[9] J. Adianto, "Desain Unit Hunian Rumah Susun Sederhana Sewa: Modularisasi Raga Tanpa Jiwa," *Jurnal Tesa Arsitektur,* vol. 7, no. 2, 2009.

[10] A. Ferré, Total Housing (ENG ED.), Barcelona: Actar Publisher, 2010.

[11] H. Schaffers, N. Komninos, M. Pallot, B. Trousse, M. Nilsson, A. Oliveira, "Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation," *J. Domingue et al. (Eds.): Future Internet Assembly, LNCS 6656,* p. 431–446, 2011.

[12] P. Lombardi, S. Giordano, H. Farouh, W. Yousef, "Modelling the smart city performance," *Innovation: The European Journal of Social Science Research,* vol. 25, no. 2, pp. 137-149, 2012.

[13] P. Neirotti, A. D. Marco, A. Corinna Cagliano, G. Mangano, F. Scorrano, "Current trends in Smart City initiatives: Some stylised facts," *Cities: The International Journal of Urban Policy and Planning,* vol. 38, p. 25–36, 2014.

[14] C. K. Tania dan F. Lianto, "PERANCANGAN HUNIAN VERTIKAL SEBAGAI TEMPAT TINGGAL, BERKREASI, DAN BERINSPIRASI," *Jurnal Stupa,* vol. 4, no. 1, 2022.

[15] "RDTA Kota Medan Petisah," [Online]. Available: http://perkimtaru.pemkomedan.go.id/hasilcari.html. [Diakses 13 November 2024].