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Spatial segregation as an impact of the development of mass housing areas in Pamulang – South Tangerang

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ABSTRACT

The fast growing of housing development in the peri-urban areas of big cities in Indonesia is a consequence of the limitation of land in urban areas. The economic value of land is increasingly expensive, making it unaffordable for lower-middle income people. One of the housing areas that is developing in the South of the Metropolitan City of Jakarta is the Pamulang - South Tangerang area. The development of housing clusters in this area takes place sporadically on a varying scale. These housing clusters use a "one gate system", so that there are barriers between housing clusters and non-cluster housing, public and social facilities around them. The impact of the physical spatial boundaries of the land of these housing clusters is the emergence of spatial segregation problems, such as socio-economic disparities, reduced social interaction between groups, limited access between housing clusters and increased social conflict. This needs serious attention in inclusive urban spatial planning.

Introduction

The phenomenon of large-scale housing development in major cities in Indonesia demonstrates a noticeable shift toward peri-urban areas. As urban land becomes increasingly limited and the economic value of urban land rises, peri-urban areas, which still provide extensive land with relatively lower economic value, have emerged as development zones for mass housing that remains affordable for lower-middle social groups. The development pattern with the typology of landed houses on a large scale appears to take place in two ways, namely planned and organic (unplanned). Planned development patterns are evident in large-scale projects on expansive land, consisting of more than five hundred housing units, and equipped with their own public and social facilities. In contrast, on smaller parcels of land, with fewer than one hundred housing units, settlement development occurs organically and sporadically, thus reflecting irregular arrangements, commonly referred to as urban sprawl.

The process of urban sprawl constitutes urban expansion toward peripheral areas, beginning with housing development (Wagistina and Antariksa 2019). The proliferation of residential construction is characterized by the use of the cluster system, where land is developed under the concept of a “gated community,” marked by massive perimeter walls and a single controlled

entrance and exit point. This cluster-based arrangement offers a higher level of security; however, it simultaneously gives rise to the implications of spatial segregation, wherein particular social groups are physically separated within the residential environment.

Pamulang – South Tangerang City, as part of the peri-urban region of Jakarta, represents a relevant example where the phenomenon of spatial segregation is clearly observable in the pattern of mass housing development through the cluster system, implemented in the absence of comprehensive spatial planning policies. This area has gradually become one of the primary destinations for residents seeking affordable housing. The rapid population growth in Pamulang is influenced by several factors, including the demand for affordable housing, the provision of clusters for lower-middle economic strata, and relatively good accessibility to economic centers in Jakarta and its surroundings. Peri-urban areas such as Pamulang play a significant role in urban dynamics, functioning as transitional zones between the core city and suburban areas. However, rapid growth is often not accompanied by adequate spatial planning. This condition has resulted in the emergence of large-scale settlements that expand swiftly but are insufficiently supported by infrastructure provision and public services. Although mass housing in Pamulang offers a housing solution for many residents, it also presents substantial challenges of spatial segregation.

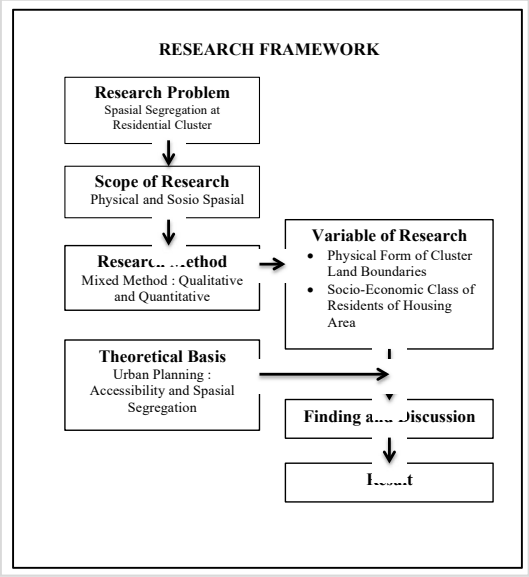
Research on spatial segregation in peri-urban areas such as Pamulang is crucial, given the unique characteristics of these zones, which tend to be less orderly and are subject to continuous transformation, thereby requiring a more inclusive and sustainable planning approach. Accordingly, this study aims to understand how the development of residential areas contributes to the problem of spatial segregation in Pamulang, what factors influence this phenomenon, and its broader implications for sustainable urban development. This research is also expected to provide policy recommendations for spatial planning in peri-urban areas such as Pamulang, where the growth of residential development that produces spatial segregation should be accompanied by the creation of spaces for social integration, capable of fostering inclusive urban life.

Methods

This research employs a mixed-method approach through both qualitative and quantitative perspectives. The qualitative approach is used to explore in depth the phenomenon of spatial segregation and the subjective understandings of residents in the Pamulang area. The study of spatial segregation in the mass housing settlements of Pamulang was carried out through several important stages that ensured the data collected were valid and relevant to the research objectives. These stages included preparation, data collection, analysis, and the compilation of a comprehensive final report. The following elaborates the stages undertaken in this study:

1. Preparation stage

In this initial phase, the primary focus was on establishing a clear and structured foundation and research framework.



Identifying the research location:

Identifying the research location was a crucial step in understanding the dynamics of spatial segregation in Pamulang. The selected sites encompassed various types of mass housing in the Pamulang area, with considerations of socio-economic variation, accessibility, and infrastructure availability. This process involved preliminary surveys to determine areas that were both representative and relevant to the research objectives.

Developing research instruments:

Research instruments such as questionnaires and interview guidelines were carefully developed to ensure that the data obtained could provide profound insights into the phenomenon of spatial segregation. The questionnaire was designed to collect quantitative data on demographics, income levels, access to public facilities, and residents' perceptions of their living environment. Meanwhile, the interview guidelines were prepared to examine subjective experiences and community perspectives related to spatial segregation.

2. Data collection stage

This stage constituted the core of the research process, in which empirical data were collected from the field through various methods.

Conducting field observations:

Field observations were undertaken to obtain a real picture of the physical and social conditions in Pamulang's mass housing settlements. These observations included mapping the physical areas, analyzing infrastructure, and observing social interactions within different residential environments. Observations also contributed to identifying segregation patterns that were not visible in quantitative data.

Impelementing interviews and questionnaire surveys:

In-depth interviews were conducted with a variety of stakeholders, including residents, community leaders, and urban planners, to obtain diverse perspectives on spatial segregation. Questionnaire surveys were distributed to a sample of residents within the research locations to gather broader data on socio-economic conditions, access to public facilities, and perceptions of spatial segregation.

Collecting related documents:

Documents such as spatial planning maps, urban development plans, and statistical data from local government authorities were gathered to support further analysis. These documents provided historical and policy contexts influencing the development of Pamulang and the occurrence of spatial segregation.

3. Data analysis stage

Descriptive analysis of demographic and socio-economic data was employed to understand the characteristics and dynamics of the population as well as the social and economic conditions of particular groups or regions. Through this analysis, data such as age, gender, education level, occupation, income, and housing status were examined to illustrate the community profile under study. By mapping these variables, descriptive analysis offered a clear picture of demographic structures and prevailing social and economic patterns, thereby serving as a foundation for formulating more targeted development strategies or policies.

Qualitative data from interviews were analyzed using thematic analysis, which enabled the identification of key patterns and themes related to spatial segregation. This process involved coding data, identifying main themes, and drawing conclusions based on field findings. Such techniques helped to understand how spatial segregation was perceived by the community and how it affected their daily lives.

Spatial analysis was carried out to map spatial segregation in the study area using Geographic Information System (GIS) software. This analysis involved mapping the distribution of residents based on socio-economic parameters and identifying areas experiencing significant spatial segregation. The results of this spatial analysis were used to visually represent segregation patterns in Pamulang.

Analysis of spatial planning policies related to residential development was conducted as an evaluative process aimed at assessing the extent to which existing spatial planning policies supported or hindered the development of residential areas. In this analysis, regulations governing land use, zoning, and urban planning were examined in detail to understand how such policies influenced the distribution and quality of settlements. The process also involved assessing the alignment between implemented policies and community needs, as well as their impacts on the environment, accessibility, and social well-being. The outcomes of this analysis provided more informative recommendations for future spatial planning and management.

The results of qualitative and quantitative analyses were integrated to present a comprehensive understanding of spatial segregation in Pamulang. This integration helped to address the research questions, such as the

factors influencing the emergence of spatial segregation and its implications for sustainable urban development.

These research stages are expected to contribute significantly to understanding and addressing spatial segregation in peri-urban areas such as Pamulang, as well as to encourage more inclusive and sustainable urban planning.

Results and discussion

The issue of spatial segregation, which refers to the physical and social separation between community groups within urban space specifically in the development of mass housing with the cluster system creates a set of complex challenges.

This research focuses on an in-depth analysis of the patterns of spatial segregation occurring in mass housing settlements in Pamulang, South Tangerang City. Spatial segregation can be understood as the separation of community groups based on specific criteria such as economic status, ethnicity, religion, or access to resources. In this context, the research explores how spatial segregation materializes physically in the form of settlement layouts, demographic distribution, as well as access to infrastructure and public facilities. The characteristics of this segregation are identified through a geospatial approach, which includes mapping segregated areas, analyzing spatial layouts, and examining existing housing patterns. The central question seeks to reveal how segregation shapes settlement structures and influences the social dynamics of the area.

This research examines physical factors, such as land boundary configurations and the availability of social and public facilities (public spaces), as well as socio-economic factors, such as the preference of certain groups to live near others of similar background, in addition to security considerations that constitute primary motivations in housing choices. Furthermore, the study also takes into account historical factors that may contribute to spatial segregation, such as migration patterns or the development trajectory of the area over time. By understanding these factors, the research provides deeper insights into the mechanisms that perpetuate spatial segregation in the study area.

Spatial segregation not only shapes the physical structure of residential areas but also has significant implications for the daily lives of residents. This study focuses on the impacts of segregation on accessibility to social and public facilities, such as circulation networks, green open spaces, houses of worship, and other public areas. The research analyzes whether segregated groups experience unequal access that exacerbates segregation conditions. It also explores the effects of spatial segregation on social cohesion within Pamulang's mass housing settlements. Social cohesion refers to the level of solidarity and interaction among residents within a community. Spatial segregation can weaken social cohesion by creating physical and social barriers that separate groups, thereby hindering interaction among residents and leading to social isolation. This research aims to understand the extent to which spatial segregation influences social relations in the study area and its broader implications for local community well-being.

The role of spatial planning and local government policy directly or indirectly contributes to the formation of patterns of spatial segregation in mass housing areas of Pamulang. Spatial segregation is not merely a naturally occurring social phenomenon; rather, it is often reinforced by planning processes and policies that fail to adequately address segregation issues. Most of the literature on spatial segregation has concentrated on core urban areas, where inequalities in access to public facilities, housing, and social services are often more visible. However, peri-urban areas such as Pamulang offer a distinct context, in which the dynamics between the city center and the periphery, and between various social groups, generate unique forms of segregation. This study seeks to fill a gap in the literature by examining spatial segregation in peri-urban areas experiencing rapid development yet remaining underexplored.

The study also contributes directly to discussions on spatial planning and urban development policy. By examining spatial segregation in the context of Pamulang, the research provides insights into how spatial planning can mitigate or in some cases exacerbate segregation. The findings are particularly relevant for policymakers responsible for planning and managing peri-urban areas. This study highlights Pamulang as a specific case study, which has not been widely examined in previous research. Most studies on spatial segregation in Indonesia have

focused on major cities or metropolitan regions without considering the complexities of peri-urban areas such as Pamulang. This research offers a new perspective by concentrating on areas situated at the threshold between urban and rural, which possess unique characteristics in terms of spatial and social development.

This study presents an integrated analysis linking social and physical segregation two aspects often treated separately in previous studies. Accordingly, it offers a more holistic understanding of how spatial segregation is produced both through the socio-economic structures of society and through prevailing spatial planning practices.

In an era where sustainable development has become a global priority, this research highlights the implications of spatial segregation for sustainable urban development. The study identifies the challenges faced in creating inclusive and sustainable urban environments in peri-urban contexts. The findings are expected to provide input for sustainable development strategies, particularly within the context of developing countries such as Indonesia.

The study also seeks to address local challenges faced by Pamulang and its surrounding areas. In this regard, the research offers specific and applicable policy recommendations to address spatial segregation issues, which can be utilized by local governments in formulating urban planning and housing policies.

By combining advanced spatial analysis, a focus on specific peri-urban areas, and practical relevance for urban planning, the research offers significant novelty to studies of spatial segregation in Indonesia. It not only enriches academic understanding of spatial segregation but also provides practical guidance for planners and policymakers to create more inclusive and sustainable cities.

Pamulang, as part of South Tangerang City, was selected as the study object because geographically it represents a peri-urban area south of metropolitan Jakarta. Pamulang has become a preferred choice for urban residents seeking affordable housing for the lower-middle class.

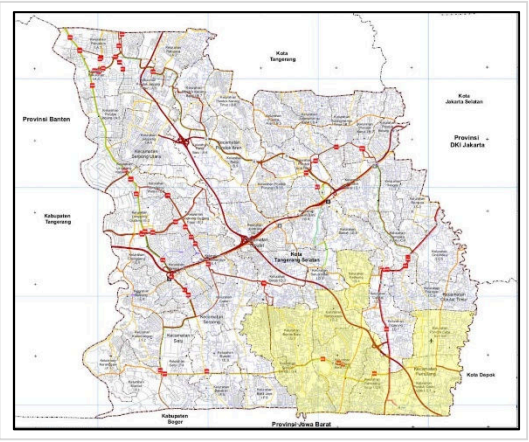


Figure 1. Map of Pamulang district – South Tangerang
Source: RDTRWP of South Tangerang city

The growth of clustered housing developments in Pamulang continues sporadically, without adequate spatial planning. The physical boundaries of residential land create problems of spatial segregation, which in turn produce both social and spatial segregation issues. Spatial segregation not only affects access to physical facilities but also influences social structures and community cohesion. The separation of community groups within urban space reduces interaction among divided social groups, which ultimately undermines social cohesion and increases the potential for inter-group conflict. The development of mass cluster housing pays insufficient attention to public and social facilities and to accessible public spaces for all social strata as venues for social interaction.

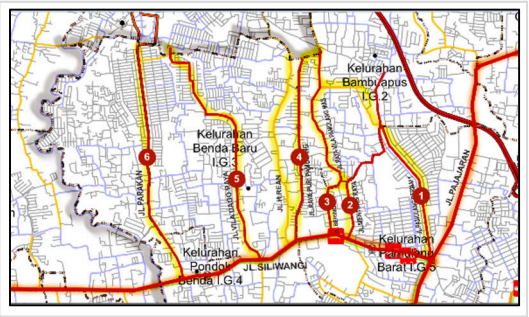


Figure 2. Six main residential corridors of Mass housing in Pamulang
Source: adapted from RDTRWP of South Tangerang city

From the six corridors selected as samples (figure 2) within the mass housing development areas of Pamulang, each corridor demonstrates a unique pattern of spatial segregation, namely:

a. Corridor 1: Jalan Pamulang Permai

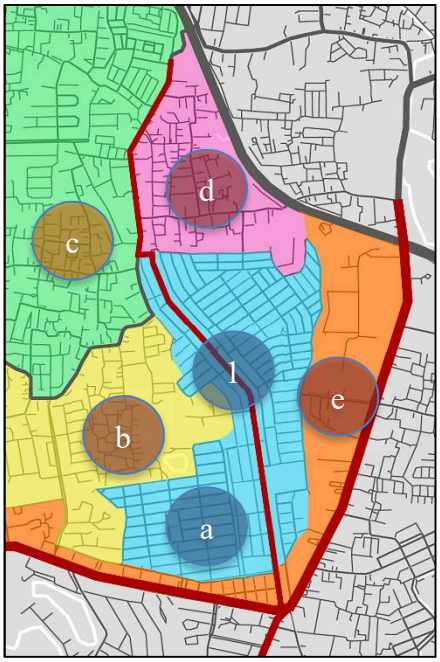


Figure 3. Map of Pamulang Permai housing and surroundings
Source: adapted from Google Maps

Pamulang Permai 1 Housing (a), constructed in 1991, represents the earliest mass settlement in Pamulang. Initially, the grid-based layout of this housing was open to commercial functions along Siliwangi and Pajajaran roads (e). However, it has since transformed into a cluster with restricted access through gates and the establishment of security posts at entrances. The main road, nevertheless, remains open, leading to the conversion of residential functions into commercial uses. Spatial segregation emerged alongside these functional changes, with the development of new mass housing clusters occurring in areas b, c, and d.

b. Corridor 2: Jalan Menteng Raya

Jalan Menteng Raya serves as the main road of the Gria Jakarta housing complex (a), bordering an organic settlement (b) predominantly inhabited by low-income residents under rental systems. A pedestrian pathway equipped with a gate and stairs connects the Gria Jakarta cluster with the organic housing area (figure 4).

Figure 4. Access between Gria Jakarta cluster and organic housing (c)

c. Corridor 3: Jalan Beringin

This road also provides access to the Gria Jakarta Housing (Jl. Sawo). On its western side lies an organic housing settlement occupied by low-income renters. This organic settlement

directly borders the Puri Pamulang housing estate. However, no connecting access exists between the two.

d. Corridor 4: Jalan Puri Pamulang

This road forms the main axis of Puri Pamulang housing, consisting of modest housing units (lot size 60 m²). It is situated beneath high-voltage power lines and along a river corridor. The main road also functions as an access route toward organic settlements and newly developed clusters.

e. Corridor 5: Vila Dago Raya

This corridor is the main road of the upper-middle-class Vila Dago Housing, designed under the cluster concept. No direct access exists between clusters, nor is there connectivity with other residential clusters overall. Limited permeability occurs only at the Kintamani Cluster, which is narrowly connected to the Anggrek Pamulang Cluster. Vila Dago Housing includes a Club House, accessible exclusively to residents. On the northern side of this corridor lies the large Al Kautsar Grand Mosque.

f. Corridor 6: Jalan Parakan - Pondok Benda Permai

Jalan Parakan functions as a primary collector road branching from Jalan Siliwangi, which itself is a secondary arterial road. It serves as the main access to Pondok Benda Housing. Along this corridor, several clusters have been developed with entrances opening onto Jalan Parakan, such as Pamulang Residence Cluster, Arjuna Cluster, and Bumi Serpong Residence. Pondok Benda Housing was originally designed in an open grid pattern, allowing road connections to newly developed clusters on the western side, including Cendana Cluster, Griya Pamulang Extension, and Green Pamulang Estate.

From these six corridors, the development of mass housing in Pamulang can be summarized into two categories: open settlements (non-clustered) and enclosed settlements (clustered). The open layout emerged during the early phase of housing development in Pamulang in the 1990s, exemplified by two large-scale estates: Pondok Benda Permai and Pamulang Permai. These estates featured main access roads leading to residential blocks, designed under a grid system without massive boundary walls. In contrast, the enclosed (clustered) layout developed sporadically in later years. The cluster concept became a marketing feature in housing sales, with entrance gates marking the boundary of private residential areas. Vila Dago Housing was originally conceived as a closed (clustered) development, with commercial facilities located outside its main gate. However, over time, its main road evolved into a public access route serving other settlements, and housing along the main road was gradually converted to commercial functions.

Limited accessibility has been identified at certain points within cluster boundaries. These access points are required by surrounding neighborhoods, either for circulation or for practical mobility, even though they are typically restricted to pedestrian and two-wheeled vehicle use.

Clusters containing 200 to more than 1,000 housing units generally provide internal public facilities, such as open parks, places of worship, shops, and restaurants. The spatial arrangement of these public facilities has experienced rezoning over time. Clusters built before 2000 typically placed commercial facilities at the front entrance, while other social and public facilities were distributed within the cluster in compliance with regulatory requirements. In these large clusters, the main road functions have shifted: once the cluster gate lost its role as a restricted boundary, the road was reclassified as a public street, and houses along it were converted to commercial use.

Smaller clusters, with fewer than 200 units, are generally unable to provide adequate social and public facilities. Nonetheless, places of worship (mushola) are often forcibly integrated within the cluster. The number of these small clusters has expanded rapidly without being accompanied by structured *Rencana Detail Tata Ruang Wilayah Perencanaan Kota* (detailed urban spatial plans), such as new collector roads, district-level public spaces, or adequate religious facilities.

Conclusions

Based on the findings and discussion of spatial segregation resulting from the development of housing clusters in Pamulang, it can be concluded that the clustered housing system—characterized by physical land boundaries and single gated access has exacerbated spatial segregation within residential areas.

Socio-economic disparities are evident between cluster residents and those living in organically developed housing nearby. The negative impacts of such segregated spaces include weakened kinship relations and diminishing social cohesion among communities. Connectivity between clustered housing and surrounding neighborhoods is necessary, particularly through limited accessibility and permeability solutions, such as pedestrian and two-wheeled vehicle pathways, as a compromise to facilitate mobility.

The presence of public spaces remains essential as a platform to foster cohesion and social interaction. Consequently, policies governing the provision of public spaces at the mezzo-scale are required, so that these spaces may function as integrative nodes (*spatial integration*) for residents of mass housing clusters.

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Author(s) contribution

Soenarto Pantjaputra contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.

Yohanes Basuki Dwisusanto contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

Yohanes Karyadi Kusliansjah contribute to methodology, supervision, and validation.

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