Explaining the relationships governing spatial-residential segregation in peri-urban areas: A content analysis

Somayeh Ahani[1] (Corresponding author), Hashem Dadashpoor[2]

1- Urban and Regional Planning Department, Faculty of Fine Arts, University of Tehran, Tehran, Iran, somaye.ahani@ut.ac.ir
2- Urban and Regional Planning Department, Faculty of Arts and Architecture, Tarbiat Modares University, Tehran, Iran

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Abstract
This study employs a qualitative content analysis method with a mixed (inductive-deductive) approach, using NVivo software, to systematically analyze 140 valid sources to precisely examine the phenomenon of socio-spatial segregation as one of the most important and complex contemporary developments in the suburban areas of metropolitan cities. The findings of this research indicate that the complex, multi-layered relations governing this phenomenon fall into two overarching and interconnected structures: "intrinsic" and "spatial."
The intrinsic structure consists of three main and fundamental dimensions: the functional-social dimension (centering on issues of racial discrimination and widespread social deprivation), the value-economic dimension (with a specific focus on deep and growing class disparities), and the behavioral-institutional dimension (with important components such as institutional fragmentation and dispersal). These three dimensions are objectively and tangibly manifested in the spatial structure of these areas, which itself comprises three key components: an enclosed and fragmented physical form and structure, a dispersed and heterogeneous ecological landscape, and fundamental changes in land use and productivity.
Ultimately, these six components, together and in interaction with one another, form a comprehensive, systematic, and effective theoretical framework that scientifically and accurately explains and analyzes the complex, dynamic, and systematic relationships governing the phenomenon of segregation in the suburban areas of metropolitan cities.

Keywords: Content Analysis, Peri-Urban Areas, Spatial-Residential Segregation, Spatial Structure, Urban Segregation

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Introduction

Spatial segregation has been one of the persistent urban realities from past to present and is considered an important concern in urban and regional planning and design. This phenomenon has intensified with the rapid expansion of megacities into peripheral areas—resulting from uncontrolled population growth and migration—and has produced numerous heterogeneous changes in the spatial structure of peri-urban areas (Firman, 2004). Recent experiences, especially in the peri-urban areas of developing countries, show that the development of

infrastructures such as roads, in addition to improving accessibility, can intensify residential segregation and socio-spatial disparities (Adugbila et al., 2023).

The idea of difference is separation based on the concept of space. In the segregation literature, the "idea of difference refers to the production and reproduction of social boundaries based on perceived and identity-based distinctions among population groups; that is, groups—by emphasizing ethnic, cultural, economic, or status-based differences—divide space symbolically and physically, and through these boundaries, distinct and hierarchical residential patterns take shape. This process manifests clearly in peri-urban areas; peri-urban communities seeking a homogeneous lifestyle often detach themselves from broader processes of civic life, and this detachment becomes embodied in spatial patterns. The consequences of this process include competition for space, housing market demand, demographic structure, household income level, and accessibility (Farley, 1986). Spatial segregation—by limiting equal opportunities and creating self-reinforcing structural cycles—affects quality of life and its spatial distribution.

This phenomenon is a historical and social product of the interaction and contradiction among economic, political, and social processes and emerges at various scales, from local to global (Alvarez, 2016). Recent studies indicate that in new metropolitan developments, urban planning can function as an independent factor that produces severe forms of spatial–residential segregation, surpassing conventional patterns of the market and social institutions (Gong & Wei, 2022). Moreover, the lack of evidence-based decision-making prevents the formation of standardized frameworks for inter-regional comparisons (Sareen & Haque, 2023).

Separated communities not only reshape the urban landscape; they also generate new physical scenarios in which the proximity of social groups turns into a form of segregated coexistence (Michelini & Pintos, 2016). Spatial segregation refers to the pattern of classifying population groups across different parts of space, and segregation measures attempt to quantify the degree of this separation (Farber et al., 2015). These measures are the quantitative indices of segregation that assess concentration, dispersion, spatial separation, or social differentiation among population groups. Despite these quantitative efforts, spatial segregation remains a complex and—in many cases—ambiguous phenomenon in the existing literature (Keshavarzi et al., 2026).

Massey and Denton (1988) define the dimensions of spatial segregation as equality/inequality, isolation/exposure, concentration, dispersion, and clustering. Pradoto (2012) also emphasizes various levels of spatial segregation, including residence by education and income, housing typologies, rigid gatekeeping shaped by kinship, and social class.

Three major approaches have been proposed to explain segregation patterns: human ecology, social area analysis, and the behavioral approach (Firman, 2004; Spielman, 2008; Cadwalder, 1985). Neo-Marxist and neo-Weberian perspectives interpret spatial segregation, respectively, as a reflection of social class structures and as an outcome of differential access to the housing market (Kaplan, 2004; Firman, 2004).

Synthesizing this body of literature, the present study identifies three key concepts as the analytical foundation: "governing relations," "intrinsic structure," and "spatial structure." "Governing relations" refer to the set of economic, social, political, and institutional interactions that influence the formation and persistence of spatial segregation. The "intrinsic structure" and "spatial structure" represent two fundamental and complementary dimensions that, respectively, describe the demographic–social characteristics and the physical–spatial patterns of peri-urban areas.

Together, these three components constitute the theoretical framework of the study and serve as the core analytical criteria in the findings section.

A precise understanding of segregation and the development of practical solutions are key steps for achieving balanced peri-urban development. Despite the abundance of studies, systematic

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review and comprehensive examination of the governing relations behind segregation have been limited. Accordingly, the present research seeks to answer the question, "What are the governing relations of segregation in peri-urban areas, and what components do they include?" and proposes a comprehensive theoretical framework for analyzing these relations, which can support logical and principled examination of peri-urban areas in future research.

Materials and Methods

This research is qualitative in nature and follows a combined (inductive–deductive) content analysis approach. In the first step, the data were extracted through inductive reading of the sources so that concepts and codes would emerge directly from the data. In the second step, the resulting themes were compared with well-known theoretical frameworks in the literature (including the social, economic, and physical dimensions of segregation) in order to achieve theoretical overlap and coherence. This combination made it possible to conduct data-driven and theory-driven analysis simultaneously and resulted in the development of a conceptual model that is grounded in the data while also theoretically substantiated.

To identify the basic data, the search for sources was conducted in three stages. First, the terms "urban segregation," "residential segregation," "peri-urban," and "spatial exclusion," along with their Persian equivalents, were combined using Boolean operators (AND/OR). In the second stage, the search was performed in international databases such as Scopus, Springer, ScienceDirect, Sage, Taylor & Francis, and Wiley, as well as domestic databases including MagIran. In the third stage, the time span from 1960 to 2025 was selected for analysis so that the theoretical and empirical evolution over more than six decades could be examined. In this process, 235 scientific sources—including articles, books, and research reports—were identified.

To ensure conceptual relevance and scientific quality, the inclusion and exclusion criteria were formulated transparently and in a reproducible manner. These criteria were designed according to the principles of systematic review so that the screening process would have transparency and replicability. The inclusion criteria consisted of direct focus on the phenomenon of spatial–residential segregation in peri-urban areas, the presence of a theoretical framework or valid empirical data, and relevance to the social, economic, institutional, or physical dimensions of segregation. In contrast, studies that focused on central areas, lacked a clear analytical method, or repeated similar content were excluded.

Accordingly, the screening process was carried out in three steps: title screening (removal of 15 sources, leaving 220), abstract review (removal of 33 sources, leaving 187), and full-text reading (removal of 47 sources, leaving 140 final sources). This process was conducted following the PRISMA framework, and the reasons for exclusion at each stage were documented. Then, the quality of the selected sources was assessed based on five indicators: clarity of purpose, clear methodology, support of claims with evidence, adequacy of data, and validity of theoretical reasoning. Sources that received a score below 6 out of 10 were excluded to prevent low-quality data from entering the coding process.

In the qualitative analysis stage, the unit of analysis was considered to be the "unit of meaning," meaning a sentence or passage that expresses an independent concept related to the phenomenon under study. The meaning units were selected based on conceptual equivalence and semantic independence to prevent conceptual overlap. Each meaning unit was accurately identified, labeled, and recorded in NVivo software. For each code, a precise definition along with an excerpt from the original source text was documented in the codebook and provided in the appendix of the article to ensure coherence, reproducibility, and traceability of the conceptual derivation process. The analysis continued until new data no longer produced new concepts, thereby achieving theoretical saturation.

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The coding process was carried out in three steps: (1) open coding, during which 34 initial codes were extracted based on recurring themes in the sources; (2) axial coding, in which conceptually and causally similar codes were merged and organized into 14 subcategories; and (3) selective coding, in which the subcategories were theoretically integrated into 6 main clusters. The criteria for merging included recurrence across sources, conceptual similarity, and explanatory power. The complete list of codes and categories is provided in the appendix of the article.

To control bias and to distinguish between data-driven and theory-driven codes, the first stage of analysis was carried out entirely inductively to avoid imposing theoretical assumptions. In the final step, the resulting codes were compared with existing theories in the field of urban segregation (such as Massey & Denton's five-dimensional model, urban ecology theories, and neo-Marxist perspectives). The origin of each code (data-driven or theory-driven) was specified in the codebook to ensure analytical transparency and bias control.

To assess the reliability of the analysis, 30 percent of the sources were independently coded by three researchers. The level of agreement between two coders was calculated using Cohen's Kappa coefficient ($\kappa = 0.83$), indicating strong agreement. Minor discrepancies were reviewed in group meetings and resolved through final consensus. All stages—from coding to combining categories—were conducted in NVivo 10, and a chain of evidence, including codebook versions, change histories, and documentation of review sessions, was maintained to ensure traceability and validity of the process.

The initial codes were reduced into subcategories and final clusters based on three main criteria: (1) frequency of repetition across sources, (2) explanatory power and relevance to segregation mechanisms, and (3) conceptual coherence and theoretical overlap. The process of merging and reduction was documented in NVivo and in the codebook to preserve the possibility of follow-up and evaluation. Ultimately, six main clusters—including the social–functional, economic–value, institutional–behavioral, physical–spatial, ecological, and functional–activity dimensions—were extracted, forming the final analytical framework.

To enhance the validity of the analysis, three complementary methods were used: (1) peer review by two urban planning experts and one urban sociology researcher, (2) theoretical triangulation through comparing the final themes with established theories in segregation and urban studies, and (3) rich description, including providing excerpts from the original texts in the appendix to clarify the conceptual derivation process.

In total, after screening and quality assessment, 140 sources entered the analysis. In the coding process, 34 initial codes were extracted and were eventually reduced to 14 subcategories and 6 major clusters. The agreement among coders was 0.83, and all stages were recorded in NVivo to ensure the transparency and accuracy of the analytical process.

The qualitative content analysis approach in this study was conducted based on the frameworks proposed by Hsieh & Shannon (2005) and Braun & Clarke (2006), and all stages of coding, organizing, and theme analysis were performed using NVivo 10 in accordance with the guidelines of Bazeley & Jackson (2013).

Preliminary Analysis of the Frequency and Co-Occurrence of Concepts

Given the large volume of sources and the diversity of the extracted subcategories, it is necessary to provide a quantitative and comparative picture of the coded data before entering the detailed analysis. In qualitative content analysis, presenting such a summary is considered an essential step, because it shows the extent to which each subcategory has been repeated across different sources and which clusters have had the highest co-occurrence or conceptual association with one another. This overview not only prevents the dominance of a purely descriptive narrative but also enables subsequent analyses to be supported by quantitative evidence.

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In other words, presenting the relative frequency of subcategories and the co-occurrence matrix of clusters provides a preliminary map of the data, which both facilitates understanding of the overall structure of the findings and indicates which components carry more analytical weight in shaping the intrinsic and spatial dimensions of segregation. Accordingly, Table 1 presents the summary of subcategory frequencies, and Table 2 displays the co-occurrence patterns among the main clusters, providing a transparent and well-grounded basis for proceeding to the detailed analysis.

Table 1: The relative frequency of the extracted subcategories

Subcategory	Relative Frequency
Inequality of opportunities	High
Physical–spatial distinctions	High
Enclosed residential patterns	High
Institutional weakness	Moderate
Limited access to services	Moderate
Housing market pressure	Low

This table shows which subcategories have had the highest repetition in the reviewed sources and therefore play a more prominent role in shaping the intrinsic and spatial dimensions of segregation. Subcategories with a "high" frequency constitute the main analytical pillars.

Table 2: The co-occurrence matrix of the main clusters

Cluster	Social–Functional	Economic–Value	Institutional–Behavioral	Physical–Spatial	Functional–Activity
Social–Functional	—	High	High	Moderate	Low
Economic–Value	High	—	Moderate	Moderate	Low
Institutional–Behavioral	High	Moderate	—	High	Moderate
Physical–Spatial	Moderate	Moderate	High	—	Low
Functional–Activity	Low	Low	Moderate	Low	—

Table 2 illustrates the co-occurrence of the main clusters. Values of "High" indicate that two clusters have appeared simultaneously across a wide range of sources and therefore have a stronger conceptual relationship. For example, the **social–functional**, **economic–value**, and **institutional–behavioral** clusters have shown the highest co-occurrence, indicating their close interconnection in the mechanisms of segregation in peri-urban areas.

Research Findings

After presenting the preliminary analysis of the frequency and co-occurrence patterns of the extracted concepts, this section organizes the research findings based on the two main dimensions of *"intrinsic structure"* and *"spatial structure"*, and then interprets them within the broader framework of *"governing relations."* This approach makes it possible to analyze both the internal and intrinsic characteristics of the areas and the external and structural mechanisms influencing segregation.

The Intrinsic Structure of Segregation in Peri-Urban Areas

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The intrinsic structure of segregation in peri-urban areas reflects the complex nature and character of this phenomenon. This structure emerges from the interweaving and interplay of social, economic, and institutional processes, each of which inherently possesses different orientations and interests (Tesfay et al., 2025).
An examination of the selected sources shows that segregation in peri-urban areas can be explained through three fundamental dimensions:
First, the **social–functional** nature, which refers to the behavioral, cultural, and social relations among different groups;

Second, the **economic–value** nature, which is associated with class disparities, fluctuations in land value, and consumption patterns;
And third, the **institutional–behavioral** nature, which concerns the role of policies, institutions, and governance structures in intensifying or moderating segregation.
Overall, the interaction among the social, economic, and institutional dimensions in peri-urban areas produces a cycle of reproducing inequality, in which ineffective policies exacerbate economic inequality, and this inequality, in turn, creates the conditions for social closure and spatial separation. The following section examines each of these three components in detail.

The Social–Functional Nature
A significant part of the nature of segregation in peri-urban areas relates to the social–functional structure—a structure that has been the focus of researchers for decades. In the present era, these areas, due to the increasing range and severity of social issues, have turned into centers of transformation. The erosion of values and stable social norms has disrupted the natural functioning of these spaces and created a basis for social segregation.
Segregation is a variable dependent on social exclusion (Ghalehnoei & Sabet, 2019). Studies show that segregation often results from discrimination and inequality (Bråmå, 2008; Winarso et al., 2015) and is a reflection of broader structural inequalities that should not be regarded as a neutral phenomenon (Dadashpoor & Keshavarzi, 2024).
Furthermore, research emphasizes that the concentration of inequalities in peri-urban areas reproduces social gaps and reinforces segregation patterns. This evidence indicates that an important part of the social–functional mechanisms of segregation is not merely the outcome of economic factors, but is rooted in the accumulation of inequality and the weakening of intergroup relations.
Comparative studies in the field of peri-urban settlements confirm this interpretation and show that the accumulation of inequality is the primary driving force behind the formation of social segregation patterns and almost everywhere leads to reduced intergroup interactions and weakened social cohesion.
In addition, the dynamics of segregation are influenced by demographic processes. As noted in the study by Bråmå (2008): “Migration flows and selective population movement contribute to the dynamics of ethnic segregation.” This evidence indicates that demographic changes, economic migration, and selective mobility of groups undermine the foundations of social functioning in peri-urban settlements and lead to the emergence of persistent segregation patterns.
In such a context, minority groups are more exposed to harm than others; their vulnerability accelerates the process of social separation and reduces their opportunities for adaptation and interaction with society (Andersen & Taylor, 2005). Ethnocentric behavior and the human tendency to coexist with similar groups can also be explained within this framework. Parkin (1987) considers all class, status, gender, racial, and ethnic groupings to be unequal power structures that, through social closure and competition over resources, lead to the reproduction of monopoly and inequality.

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Findings from the literature show that wherever minority groups have been exposed to social exclusion, segregation has not only intensified but has rapidly turned into stable spatial and residential patterns—patterns that are observable in many developed and developing societies. In developed countries, segregation usually appears in the form of racial or ethnic separation. In the United States, this phenomenon is evident between Whites and African-American minorities and has produced distinct suburban residential patterns (Djonie, 2009). These patterns reflect the broad ethnic diversity in the United States (Morgan, 1983; Latham et al., 2008).

In the European Union, concerns about the expansion of ethnic neighborhoods have increased, and examples from Sweden and the Netherlands show that the high concentration of immigrants in peripheral areas intensifies racial discrimination and ethnic hierarchies (Fermin & Kjellstrand, 2005; Bråmå, 2008).

In developing countries, segregation takes a different form. In China, it appears between the native population and migrants (Zhao, 2013). Migrants, due to financial incapacity to secure urban housing and structural constraints such as the hukou system, are pushed into informal settlements (Meeus & Gulinck, 2008; Fazal, 2013; Elgin & Oyvat, 2013; Zhao, 2012). This condition, by reducing employment, educational, and welfare opportunities, intensifies social deprivation and reinforces the overlap between spatial segregation and social marginalization (Thorns, 2002; Malheiros, 2002).

Similarly, empirical studies in Southeast Asia show that inequality in the peri-urban development process itself becomes a direct factor in creating social gaps. For example, Winarso et al. (2015) state:

"Large-scale land developments in the peri-urban regions of Jakarta's metropolitan area have typically been shaped for the benefit of wealthier classes. This unequal development in peri-urban areas can potentially lead to social conflicts among different communities."

This pattern observed in Jakarta is not unique; a considerable body of literature emphasizes that inequality in peri-urban development processes is a common feature of many developing countries.

Peri-urbanization in many developing countries is a form of structural deprivation rooted in rapid urban growth since the 1960s and the large-scale migration of low-income populations (Cohen, 2004). In this regard, several studies on Latin American countries show that marginalization processes are associated with concentrated poverty and isolation in high-risk areas. As Dávila (2013) notes:

"The poorest population groups continue to live in physically and socially peripheral areas; areas where low land and rental prices make them the residence of low-income individuals and which are often located far from the city center, on steep slopes, or in locations exposed to landslides and flooding."

This pattern of settlement in high-risk and poorly serviced areas has also been reported in other studies and has pushed large populations into zones with weak infrastructure and limited access to public services (Church et al., 2000; Lucas, 2011).

The natural consequence of such conditions is weakened social cohesion; segregated groups hold different perceptions and values from others, and their sense of belonging and solidarity declines (Kelly et al., 2012). Social cohesion—built on trust and participation (Chan, 2006)—diminishes in the presence of cultural diversity, varying lifestyles, and increased segregation (Colic-Peisker & Robertson, 2015).

Extensive literature emphasizes that weak social cohesion reduces neighborhood resilience and increases tendencies toward spatial withdrawal. This issue is more evident in multiethnic societies such as the United States, where racial distinctions reduce interaction and empathy (Massey & Denton, 1993; Lee Goix, 2005; Bolt et al., 1998; Christopher, 2001; Von der Dunk et al., 2011).

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In Europe, the social acceptance of immigrants is a prerequisite for achieving social cohesion (Fermin & Kjellstrand, 2005). In Australia, skill-based immigration policies and economic growth have contributed to better integration of immigrants (Amin, 2002; Ozyurt, 2013).

Social and spatial inequality—arising from the unequal distribution of wealth, power, status, and cultural capital—is another factor that weakens social cohesion (Ledwith & Clark, 2007; Marsh et al., 2010; Garcia-Ayllon, 2018). Harvey (1998) also considers spatial inequality to be a direct reflection of social inequality. The increase in population and the migration of wealthy groups into suburbs have unbalanced service provision and deepened class divisions (Freilich & Peshoff, 1997; Galster & Cutsinger, 2007; Brinegar & Leonard, 2008).

In Mexico City, the concentration of poverty and lack of services in the city's periphery is a sign of the reproduction of social inequality. Under such conditions, feelings of insecurity, violence, and crime rise, pushing communities toward the creation of enclosed and gated spaces (Logan & Messner, 1987; Shihadeh & Flynn, 1996; Tubtim, 2014; Dávila et al., 2013; Piña, 2014; Blakely & Snyder, 1997; Low, 2003; Rodgers, 2004; Caldeira, 1996; Arthurson, 2012; Miao, 2003).

For example, Adugbila et al. (2023), in their study on Accra, state:"The displacement of low-income households intensifies processes of social–spatial fragmentation in peri-urban areas."

Such social–spatial fragmentation, consistent with global literature, is typically accompanied by heightened insecurity, social instability, and deeper intergroup divides. As a result, increasing feelings of insecurity become one of the main forces driving households toward enclosed and isolated residential patterns.

Many studies show that lifestyle preferences and the search for security play a central role in choosing gated and isolated residential patterns. In other words, the pursuit of security and distinct lifestyles is just one mechanism which, along with other social–functional factors, contributes to the reproduction of segregation patterns in peri-urban areas.

Based on the code counts in the reviewed sources, the highest frequencies correspond to concepts such as social discrimination, deprivation, and reduced social cohesion—concepts repeatedly mentioned in the majority of sources and indicating that the core of this category centers on the reproduction of inequality and social divisions.

Overall, the social–functional nature of segregation in peri-urban areas is grounded in components such as racial and ethnic discrimination, social deprivation, declining social cohesion, spatial and social inequality, and urban insecurity and violence. Each of these factors reinforces the others, creating a self-reinforcing structure of social segregation. Table 3 illustrates the key features of this nature.

Table 3. The Social–Functional Nature of Segregation in Peri-Urban Areas

Conceptual Codes	Intermediate Category	Main Category	Sources
Preference for coexistence within similar groups; ethnocentric behavior; social closure	Racial and ethnic discrimination	Social–functional nature	Parkin (1987); Bråmå (2008); Winarso et al. (2015)
Concentration of minorities in peripheral areas; spatial separation of migrants; ethnic power hierarchies			Djonie (2009); Fermin & Kjellstrand (2005); Bråmå (2008)
Employment in the informal sector; lack of housing and public services; unjust welfare systems	Social deprivation		Elgin & Oyvat (2013); Zhao (2012); Malheiros (2002); Thorns (2002)
Residence in informal areas; cultural differences and social conflict			Meeus & Gulinck (2008); Fazal (2013); Zhao (2012)
Weak trust, belonging, and social participation; weakened local bonds	Decline of social cohesion		Chan (2006); Kelly et al. (2012); Colic-Peisker & Robertson (2015)
Inequality in wealth, status, and opportunity; spatial and social injustice			Harvey (1998); Garcia-Ayllon (2018)

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Migration of affluent groups; concentration of poverty in the periphery; urban class divide	Spatial injustice and social inequality		Freilich & Peshoff (1997); Galster & Cutsinger (2007); Brinegar & Leonard (2008)
Increase in crime, insecurity, and violence; expansion of gated communities and enclosed spaces	Urban insecurity and violence		Logan & Messner (1987); Shihadeh & Flynn (1996); Tubtim (2014); Dávila et al. (2013); Piña (2014); Low (2003); Caldeira (1996); Adugbila et al. (2023)

The Economic–Value Nature

The economic–value nature of segregation in peri-urban areas refers to the interaction among residents, income levels, and market-based services. In this framework, the class gap is one of the most important components reflecting this nature—a gap that results in the settlement of deprived groups in under-resourced areas and the concentration of affluent groups in more privileged zones (Kovacs, 1999; Jargowski, 2002; Woltjer, 2014; Zhao, 2016). The outcome of such a trend is an insular landscape of enclosed communities with income and occupational inequalities (Reardon & Bischoff, 2011). In this landscape, an "ocean of poverty" forms alongside gated and protected neighborhoods of upper-income groups, undermining the spatial and social cohesion of peri-urban areas (Zahirnezhad & Dadashpoor, 2018).

In this regard, empirical findings also indicate that the concentration of poverty and economic inequality in peri-urban areas reproduces segregation structures. As Hanlon et al. (2017) emphasize for Africa:

"The dense urban area of Pikine reflects socio-economic marginalization, inadequate public services, environmental degradation, health hazards, and high crime rates."

This evidence shows how economic inequality and structural deprivation can result in persistent patterns of segregation and spatial isolation.

In interpreting the outcomes of spatial segregation, two important theories have been proposed. First, the theory of spatial assimilation, which argues that the residential location of migrant groups reflects their level of acculturation and economic mobility; according to this view, spatial segregation decreases as minority incomes rise (Grbic, 2010). In contrast, Peach's pluralist model (Peach, 1999) argues that wealthy groups maintain a degree of separation even over time. Thus, employment and income opportunities play a decisive role in shaping residential locations and the extent of spatial segregation (Douglas, 2006).

In many peri-urban areas, low-income minorities are more vulnerable to this phenomenon than other groups. The lack of connection between workplace and residence places them in social isolation and reduces access to services and opportunities. Low-skilled and foreign migrants typically live in peripheral areas with substandard housing, while their workplaces are located in manufacturing zones or industrial areas on the urban fringe. In contrast, service-sector employees and professionals tend to reside in newer and higher-quality suburban areas.

Increasing class-based segregation leads to the concentration of poverty (Jami Odolo et al., 2022) and increases intra-class contacts (Massey & Aegers, 1990). The concentration of poverty creates a social environment lacking institutions, roles, and values that guide success. Many studies in developing countries have shown that the growth of peri-urbanization has concentrated low-income groups into small, disadvantaged spaces (Massey, 1990; Hughes, 2004). In practice, this situation produces a kind of "population filter": low-income households, with limited choices, are pushed into segregated residences, shops, and workplaces separate from others and lack social and civic support (Cobbinah & Amoako, 2012).

In Latin American peri-urban regions, this pattern manifests as "islands of wealth in an ocean of poverty" (Coy & Pohler, 2002). The rapid growth of these areas is often driven by informal settlements established by poor migrants in zones lacking urban oversight and distant from employment centers (Da Gama Torres, 2011). In Jakarta, the development of exclusive new

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towns has intensified spatial segregation and transformed racial segregation into socio-economic segregation (Firman, 2004).

A similar pattern appears in developed countries. In the United States, affluent groups migrate to suburbs to escape the social problems of central cities (Audirac et al., 1990; Glaeser et al., 2000; Glaeser & Kahn, 2004). The emergence of gated communities in these areas is viewed as a solution for enhancing security and maintaining class distinction (Winarso et al., 2015). As Hudalah et al. (2007) emphasize:

"Global capital flows entering peri-urban areas not only accelerate economic growth but also deepen socio-economic divides."

Rising land and housing prices are another key factor in segregation. Many researchers argue that the inability of low-income groups to purchase housing in urban centers is the main cause of segregation (Andersen & Taylor, 2005). Rising land prices can push weaker groups out of urban areas. In Senegal, ethnic migrants have been forced into peri-urban areas due to high housing costs (Hanlon et al., 2019).

Research on the spatial structure of metropolitan Tehran indicates that the concentration of upper and lower socio-occupational classes has formed significantly in the north and south of the city, respectively—what can be described as the spatial divide of Tehran (Imani Shamloo et al., 2022).

Other studies have shown that rising land values after enclosure—although desirable for residents of these communities—lead to the decline or stagnation of land values in surrounding areas and intensify spatial inequality (Blakely & Snyder, 1997; Bible & Hsieh, 2001; LaCour-Little & Malpezzi, 2001).

In studies related to Beijing, Lin (2001) has shown that factors such as foreign direct investment, rural–urban migration, and structural economic change have increased heterogeneity and spatial segregation. As global capital flows into peri-urban zones, economic growth accelerates, yet socio-economic inequality simultaneously intensifies. This trend primarily benefits middle- and upper-income groups who expand their luxury residential areas and advanced industries in the form of enclosed enclaves (Wissink et al., 2004; Firman, 2004). In this regard, Firman (2004) states:

"The implementation of new-town projects is heavily influenced by the interests of the upwardly mobile middle class—groups seeking safe, exclusive environments with higher-quality services."

These groups build walls, gates, and exclusive infrastructure, separating themselves from poor surrounding communities (Connell, 1999; Firman, 2004).

Overall, the class gap—resulting from fluctuations in land markets, spatial valuation, and market-based services—leads to the development of gated communities. In Western countries, this trend is primarily intended to preserve social boundaries and is reflected in the physical design of neighborhoods (Wu, 2005). In China, gates and architectural features are seen as symbols of desirability and economic value and contribute to the expansion of such communities (Wu, 2010).

Based on the frequency of extracted codes, the highest repetitions relate to concepts such as class gap, rising land value, and concentration of poverty-concepts widely observed across the sources, showing that this category is fundamentally grounded in the structural inequality of the spatial economy.

Overall, the economic–value nature of segregation in peri-urban areas is based on components such as class division, economic fluctuations, market-based valuation, and patterns of consumption and housing ownership. Table 4 summarizes the key features of this nature. From this perspective, the widening class gap and the rise in land value are not only consequences of market forces but also institutional drivers that intensify spatial isolation among deprived groups, creating a recursive relationship between the spatial economy and urban poverty.

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Table 4. The Economic–Value Nature of Segregation in Peri-Urban Areas

Conceptual Codes	Intermediate Category	Main Category	Sources
Spatial distinction between affluent and deprived groups; spatial separation resulting from income differences	Class gap and income-based differentiation	Economic–value nature	Kovacs (1999); Jargowski (2002); Woltjer (2014); Zhao (2016); Reardon & Bischoff (2011); Zahirnezhad & Dadashpoor (2018)
Preservation of upper-class separation over time; effect of income on residential patterns	Class persistence and economic opportunities		Grbic (2010); Peach (1999); Douglas (2006)
Spatial distance between workplace and residence; isolation of low-income groups in access to services	Inequality in access and employment		
Concentration of poverty, intra-class contacts, weak social roles and values	Concentration of poverty and its social consequences		Massey & Aegers (1990); Massey (1990); Hughes (2004); Cobbinah & Amoako (2012)
Formation of islands of wealth in an ocean of poverty; distance from employment centers	Spatial concentration of inequality		Coy & Pohler (2002); Da Gama Torres (2011); Firman (2004)
Migration of affluent groups to suburbs to avoid urban problems	Conscious class-based separation		Audirac et al. (1990); Glaeser et al. (2000); Glaeser & Kahn (2004); Winarso et al. (2015)
Inability of low-income groups to secure urban housing; rising land prices	Housing and land market pressure		Andersen & Taylor (2005); Hanlon et al. (2019)
Rising land value in gated communities; decline of surrounding property values	Spatial inequality driven by land value		Blakely & Snyder (1997); Bible & Hsieh (2001); LaCour-Little & Malpezzi (2001)
Impact of global investment, migration, and economic change on spatial segregation	Globalization and social polarization		Lin (2001); Wissink et al. (2004); Firman (2004); Connell (1999)
Formation of gated communities as symbols of economic and social desirability	Spatial valorization and market-based services		Wu (2005); Wu (2010)

The Institutional–Behavioral Nature

Another important component in the intrinsic structure of segregation in peri-urban areas is the institutional–behavioral nature. This nature is deeply associated with the performance and behavior of private and public institutions, public policies, and the modes of state intervention in the distribution of space and urban resources. A review of the selected sources shows the decisive role of institutions—especially the state—in regulating class-, gender-, racial-, ethnic-, and religious-based inequalities (Massey & Denton, 1993; Hirsch, 1998).

Studies conducted in newly developed areas, such as Special Economic Zones, indicate that urban planning within the framework of state–market interaction and socialist characteristics, through tools such as large-scale zoning and the provision of public housing for migrant workers, can play a key role in shaping spatial segregation (Gong & Wei, 2022). Recent findings also emphasize the inadequacy of existing laws and the weakness in implementation and oversight—factors that themselves increase disorder and intensify spatial inequality. Accordingly, Salem & Tsurusaki (2024) state:

"These undesirable outcomes are a reflection of fragmented and disconnected institutional landscapes, especially at the regional scale."

This shows that institutional fragmentation at various levels of governance creates the conditions for the intensification of spatial segregation processes.

Thus, one of the fundamental challenges of peri-urban areas is the complexity of institutional structures and the overlap of responsibilities among different institutions. This situation leads to uncoordinated and scattered actions by local and private actors, which intensify institutional and physical fragmentation (Mattingly, 1999; Carruthers, 2003). Cattivelli (2021) also

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considers the mismatch between the physical–functional boundaries of peri-urban areas and their administrative–political territories as the main challenge of managing these regions, since such misalignment makes the implementation of cross-boundary projects difficult. Under such circumstances, interventions by local institutions and the private sector often occur without coordination with the governmental management system, and the variable and dynamic nature of peri-urban spaces reduces their manageability (Narain & Nischal, 2007).

Furthermore, policymaking in these areas takes place in a multi-actor context with different powers and diverse objectives (Simon et al., 2004; Aguilar, 2008; Gomes & Hermans, 2018). The absence of a unified governmental authority for decision-making results in the lack of coherent policies in housing, population, and land use, and consequently intensifies inequalities and spatial segregation. Recent findings also emphasize that mismatches between physical and administrative boundaries increase institutional fragmentation and hinder effective cooperation at regional levels (Babalola et al., 2025; Dekolo et al., 2025).

From another perspective, socio-economic changes are also among the key factors of the institutional–behavioral nature. These changes influence the patterns of social and economic segregation and determine groups' access to resources and opportunities. Some researchers consider spatial segregation a new phenomenon arising from a combination of demand-side factors (such as a desire for security) and supply-side factors (such as globalization) (Greenstein et al., 2000). Globalization, economic restructuring, and financial development , along with the formation of creative hierarchies in cities (Florida, 2003), are among the key drivers of increased income inequality and the intensification of segregation (Van Kempen, 2007).

Among these factors, two groups play the most significant role:

• Supply-related factors such as the distribution of housing, urban services, transportation infrastructure, and the design of local communities.

• Demand-related factors such as household income, desire for homeownership, and the tendency to reside in higher-quality areas (Zhao, 2013).

According to Tammaru et al. (2020), the relationship between changes in income inequality and the level of social–economic segregation becomes apparent with a delay of about one decade.

Ultimately, changes in the role of the state are also central to the institutional–behavioral nature of segregation. In Anglo-Saxon countries, liberal governments view inequality and segregation as part of the natural development process, whereas in Europe governments, with a more interventionist approach, attempt to mitigate its effects. Differences in labor market participation, welfare policies, education, and housing reflect these models (Marcuse, 1997; Roberts & Wilson, 2009; Jalili Sadrabad et al., 2018). Nevertheless, even in the welfare states of Northern Europe, the trend toward privatization and the reduction of redistributive capacity has led to rising economic inequality and, in turn, spatial segregation.

An analysis of the frequency of codes indicates that the concepts of institutional fragmentation, weak governance, and policy incoherence had the highest repetition among the sources and thus form the core of this category in explaining spatial segregation.

Overall, the institutional–behavioral nature of segregation in peri-urban areas is based on three main pillars:

1. **Institutional fragmentation**,
2. **Socio-economic changes**,
3. **Changes in the role of the state**.

The key dimensions of these components are summarized in the table below (Table 5).

Therefore, it can be concluded that an unstable institutional and policy structure plays a key role in reproducing segregation patterns; because the absence of integrated governance and the

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lack of coordination among governmental levels allow socio-economic changes to proceed without control, thereby reinforcing spatial inequality.

Table 5. The Institutional–Behavioral Nature of Segregation in Peri-Urban Areas

Conceptual Codes	Intermediate Category	Main Category	Sources
Role of the state and public institutions in regulating inequalities	Institutional performance and public policies	Institutional–behavioral nature	Massey & Denton (1993); Hirsch (1998)
State–market intervention in urban planning; zoning and public housing	Planning policies and spatial control		Gong & Wei (2022); Salem & Tsurusaki (2024)
Overlapping institutional responsibilities; misalignment in local management	Institutional fragmentation and structural incoherence		Mattingly (1999); Carruthers (2003); Cattivelli (2021)
Fragmented interventions by private and local institutions without state coordination	Institutional action dispersion and weak coordination		Narain & Nischal (2007); Simon et al. (2004); Aguilar (2008); Gomes & Hermans (2018)
Absence of a unified governmental authority and coherent spatial policies	Lack of integrated governance		Babalola et al. (2025); Dekolo et al. (2025)
Globalization and economic restructuring as drivers of inequality and segregation	Global socio-economic transformations		Greenstein et al. (2000); Florida (2003); Van Kempen (2007)
Inequality in access caused by supply-side factors (housing, services, infrastructure)	Institutionally supply-related factors		Zhao (2013)
Inequality in access caused by demand-side factors (income, ownership, residential preference)	Institutionally demand-related factors		Zhao (2013)
Time lag between income changes and socio-economic segregation	Economic dynamics and structural delay		Tammaru et al. (2020)
Differences in governance models between liberal and welfare states; reduced redistributive role of the state	Changing role of the state in spatial governance		Marcuse (1997); Roberts & Wilson (2009)

The outcome of the three subsections of the intrinsic structure shows that the inductive findings of this study relate to existing theories of segregation at several levels. First, a considerable part of the extracted themes—such as socio-economic distinctions, demographic homogenization, and the formation of status-based residential patterns—align meaningfully with the classical dimensions of segregation in Massey & Denton's five-dimensional model as well as frameworks of human ecology, and thus serve as confirming evidence. Second, some findings—particularly the role of informal networks, multi-actor interactions, and micro-level institutional mechanisms in peri-urban areas—imply the need to revise or expand existing theories; because these components have been less systematically analyzed in traditional literature on peri-urban areas and show that segregation in these regions cannot be explained solely by macro-level structural factors. Third, a set of themes—such as the link between status-based preferences and new forms of residential boundary-making in peri-urban contexts, or the role of formal–informal mechanisms in reinforcing spatial inequalities—introduce emerging dimensions that have rarely been reported in prior literature, thus forming the theoretical added value of this research. These three levels of interaction with theory indicate that the intrinsic structure of segregation in peri-urban areas represents a combination of confirming classical theories, modifying them, and introducing new concepts.

The Spatial Structure of Segregation in Peri-Urban Areas

The spatial structure of segregation in peri-urban areas is the outcome of the arrangement and organization of phenomena shaped under the influence of social, economic, political, and managerial processes. In fact, this structure reflects the ways in which space is distributed, the physical relationships, and the patterns of land use in urban–rural interface zones. The results of the systematic review indicate that although many studies have focused on the social and

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economic dimensions of marginalization, the contribution of fields such as architecture, urban design, and the built environment remains limited and insufficient in this area (Olaniran & Aule, 2025).

An examination of the selected sources shows that the spatial structure of segregation in peri-urban areas is grounded in three fundamental components:

-First, **form and physical structure**, which refers to settlement patterns, spatial concentration, and the physical organization of communities;

-Second, **landscape and ecological value**, which emphasizes the relationship between urban sprawl, spatial fragmentation, and environmental sustainability;

-And third, **functions and activities**, which encompass land-use changes, consumption patterns, and functional dynamics that influence spatial segregation.

Overall, the spatial structure of segregation reflects socio-economic inequalities in the form of physical structure; in other words, space in these areas becomes an embodied tool of power and social distinction. The following sections examine each of these components in detail.

Form and Physical Structure

Numerous studies show that the settlement pattern of peri-urban areas is consistently intertwined with a form of spatial segregation. This phenomenon is manifested within a confined physical form and structure that generates spatial concentration and social separation. Gated communities are the most prominent symbol of this structure; spaces that, through physical and controlling barriers, redefine the boundary between inside and outside and convey a sense of security, ownership, and exclusivity (Low, 2001). Le Goix considers gated communities as symbols of urban sprawl and social separation (Le Goix, 2005). The focus on spatial segregation emerges from various forms of concentration and environments of clustering, such as ghettos or enclosed urban precincts (Friedrichs, 1995; Bolt et al., 1998).

Webster and colleagues (2006) also identify four types of gated communities: the “golden ghetto” (affluent), the “brown ghetto” (single workplace unit), the “green ghetto” (collectively developed rural apartments for sale), and the “red ghettos” (private cities with a communist ethos). In this regard, Wu (2010) emphasizes that:

“Suburban residential developments in recent years have witnessed the emergence of luxurious, ornamental, and Western-style physical forms, many of which have been built as gated communities.”

This physical formation—rooted in the reproduction of exclusive lifestyle patterns—has in practice resulted in highly restrictive control mechanisms; such that these communities, through controlling entrances and exits, using walls, fences, gates, security guards, and surveillance cameras, prevent public access (Fischel, 2000; Grant, 2004; Atkinson & Blandy, 2005; Wood & Dupont, 2006).

In general, four fundamental features can be identified in gated communities: controlled entrances, fenced boundaries, an internally separated community, and private collective spaces (Kyungkim, 2006). These communities can be categorized into three main types:

1. **Lifestyle communities**, with defined service boundaries and the purpose of territorial definition;
2. **Prestige communities**, with symbolic and status-driven motivations;
3. **Security communities**, which emerge as a response to insecurity and crime (Blakely & Snyder, 1997).

Although the discourse on gated communities originated in the United States, the phenomenon has its own history and meanings across the world (Le Goix & Webster, 2008). In the U.S., the earliest examples were built to protect immigrants from natives, but later came to be used for class-based and racial separation (Low, 2003; Glaeser & Kahn, 2004; El Nasser, 2011; Logan, 2013).

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In Latin America, these communities have emerged to increase security and distance from urban poverty, as described by Caldeira in São Paulo and Bob in Nicaragua. In this regard, Rodgers (2004) notes:
"These communities limit public space and intensify feelings of isolation."
Similar patterns appear in Asia. In Surabaya, Indonesia, gated communities tend to appear as residential clusters within blocks rather than visible physical barriers (Ginting & Sakinah, 2018). In China, suburban residential transformations with Westernized and decorative styles represent this trend (Raposo, 2006; Wu, 2010).
Globally, gated communities have expanded across various countries—from the United States and Western Europe to Latin America, China, Indonesia, South Africa, and Arab countries—with motivations such as security, social status, or economic segregation. In Saudi Arabia, they are residences for migrant workers; in China and Bulgaria, for elite families; and in Europe, they function as second homes for affluent groups or organizational housing for employees (Low, 2003).
An analysis of code frequency for this category shows that concepts such as spatial concentration, physical enclosure, and security-based boundary making occurred most frequently in the sources; indicating the dominant role of gated communities in shaping the physical structure of segregation.
Overall, the form and physical structure of segregation in peri-urban areas is grounded in spatial concentration and the expansion of gated communities, which reflect multiple expressions of social, cultural, and security-based differentiation. The most important dimensions of this component are summarized in the table below (Table 6). Consequently, the formation of enclosed communities is not merely a response to insecurity or a desire for comfort; rather, it represents the institutionalization of social boundary-making in the urban fabric and an embodiment of the translation of social inequality into spatial segregation.

Table 6. Form and Physical Structure of Segregation in Peri-Urban Areas

Conceptual Codes	Intermediate Category	Main Category	Sources
Spatial concentration, social separation, physical enclosure	Spatial concentration and physical division	Spatial structure of segregation	Low (2001); Le Goix (2005); Friedrichs (1995); Bolt et al. (1998)
Emergence of gated communities as symbols of spatial segregation	Gated communities and social boundary-making		Fischel (2000); Grant (2004); Atkinson & Blandy (2005); Wood & Dupont (2006); Kyungkim (2006); Blakely & Snyder (1997)
Typology of gated communities (golden, brown, green, red)	Diversity of enclosed residential forms		Webster et al. (2006); Wu (2010)
Protection, control, and symbolic separation from the outside	Security and cultural boundary-making		Le Goix & Webster (2008); Low (2003); Glaeser & Kahn (2004); El Nasser (2011); Logan (2013)
Reaction to fear and crime; search for safety and tranquility	Response to urban insecurity		Caldeira (2000); Rodgers (2004)
Formation of intra-block clustering patterns and less-visible fences	New security and physical structures in Asia		Ginting & Sakinah (2018); Raposo (2006); Wu (2010)
Global spread of gated communities with diverse cultural meanings	Globalization and localization of enclosed forms		Low (2003)

Landscape and Ecological Value

The landscape and ecological value of peri-urban areas undergo major transformations as a result of segregation. This landscape, influenced by diverse and sometimes unsustainable land uses, gradually turns into a heterogeneous and fragmented structure in which activity spaces, residential uses, and social domains become separated from one another. Under such conditions, the importance of public spaces diminishes and is replaced by private and enclosed

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spaces—a trend that accompanies the emergence of new centers and the uncontrolled expansion of peri-urbanization.

Various studies indicate that urban sprawl, as one of the direct outcomes of peri-urban development, plays a decisive role in intensifying social–residential segregation (For example: Murphy & Watson 1994; Connell, 1999; Caldeira, 2000; Coy & Pohler, 2002; Gu & Kesteloot, 2002; Power, 2001; Chen et al., 2006; Maloutas, 2007; Arapoglou, 2009; Zhao, 2013; Shahhosseini et al., 2024).

The dispersion of low-density residential areas, luxury villas, and informal developments—alongside inconsistent urban services and weak transportation infrastructure—leads to increased separation between native and migrant residents and between low-income and high-income groups (DeHoog et al., 1991; Duany et al., 2000; Leyden, 2003; Zhao, 2013).

The concentration of poverty in some areas and the accumulation of wealth in others is a key indicator of this type of sprawl (Jargowsky, 2001). Particularly in peri-urban regions of South Asia, access to basic resources such as water, energy, transportation, and housing has become highly unequal and fragmented due to the formation of gated communities and Special Economic Zones (Adelina et al., 2015).

Furthermore, the diverse economic and social composition of peri-urban communities—from temporary migrants to middle- and upper-income groups—has created a heterogeneous and fragmented landscape (Zhao et al., 2011). The development of scattered residential infrastructure and the construction of exclusive properties in these communities further intensify this trend. In this regard, Vitriana (2018) explicitly notes that "their cooperation leads to a discontinuous and fragmented network of urban infrastructure." This condition is the result of the absence of an integrated planning system; as she emphasizes: "Without an integrated planning network, no spatial improvement will occur."

In such a context, urban sprawl intensifies due to the booming real estate market and rising land prices (Jiang et al., 2007). Developers, seeking cheap land and larger areas at the urban fringe, have turned to building enclosed and standardized residential complexes (Shen & Wu, 2013).

This trend, in Western countries—especially the United States—is considered one of the most important drivers of social segregation (Blakely & Snyder, 1997; Zhao, 2013).

In these societies, affluent households migrate from city centers to suburbs in search of security, better environmental quality, and higher property value (Arthurson, 2012; Acheampong & Anokye, 2013). Beijing is also a prominent example of the impact of urban sprawl and the expansion of gated communities in intensifying social segregation (Le Goix, 2005; Woltjer, 2014). In recent decades, an even newer form of informal gated community has emerged in the suburbs of Beijing—built without official permits—which constitute a new pattern of spatial fragmentation (Zhao, 2016, 2017; Zhao & Zhang, 2018).

An analysis of the frequency of codes related to this category shows that urban sprawl, infrastructural inequality, and spatial fragmentation were the most frequently repeated concepts in the sources—highlighting the ecological nature of segregation as a direct outcome of unbalanced urban development.

Overall, the landscape and ecological value of segregation in peri-urban areas (Table 7) reflect a fragmented ecological structure associated with urban sprawl, the disconnection of activity–residential spaces, the weakening of public spaces, and reduced access to urban services. In addition to influencing residential patterns, this process threatens food security and environmental sustainability by destroying fertile agricultural land and creating ecological divides (Salem & Tsurusaki, 2024).

Thus, the pattern of sprawl and spatial fragmentation not only affects the social and economic organization of peri-urban areas but also reproduces ecological and spatial divides, such that social inequality overlaps with environmental inequality.

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Table 7. Landscape and Ecological Value of Segregation in Peri-Urban Areas

Conceptual Codes	Intermediate Category	Main Category	Sources
Urban sprawl, uncontrolled development	Spatial fragmentation and unbalanced urban expansion	Landscape and ecological value of segregation	Murphy & Watson (1994); Connell (1999); Caldeira (2000); Coy & Pohler (2002); Gu & Kesteloot (2002); Power (2001); Chen et al. (2006); Maloutas (2007); Arapoglou (2009); Zhao (2013)
Low-density development and inconsistency in urban services	Inequality in infrastructure and services		Duany et al. (2000); Leyden (2003); DeHoog et al. (1991); Zhao (2013)
Concentration of poverty in certain areas, accumulation of wealth in others	Economic and spatial segregation		Jargowsky (2001); Adelina et al. (2015); Zhao et al. (2011); Vitriana (2018)
Investment in peri-urban land and housing	Expansion of land and housing markets in peri-urban areas		Jiang et al. (2007); Shen & Wu (2013)
Migration of affluent households to suburbs for environmental quality and security	Changing residential patterns and environmental values		Blakely & Snyder (1997); Zhao (2013); Arthurson (2012); Acheampong & Anokye (2013)
Emergence of formal and informal gated communities	New enclosure patterns and ecological fragmentation		Le Goix (2005); Woltjer (2014); Zhao (2016, 2017); Zhao & Zhang (2018)
Loss of agricultural land and ecological divides	Threat to food security and ecological cohesion		Salem & Tsurusaki (2024)

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Functions and Activities

The third component of the spatial structure of segregation in peri-urban areas relates to the functions and activities that affect these areas. These functions arise from the interaction among physical, social, and economic processes and take shape following land-use changes in the boundary zones of the city and its surroundings. In fact, the pressures arising from township settlement, the expansion of ghettos, the gentrification process, and the formation of informal suburbs cause extensive changes in land-use patterns in the encounter zones of peri-urban areas (Crankshaw, 2009; Zasada, 2011; Tavares et al., 2012; Tacoli, 1998; Low Choy et al., 2008).

These functional and demographic pressures create increasing competition between residential–activity demands and land uses with ecological value, and as a result, land-development priorities shift in favor of human and residential consumption. The outcome of this process is low-density, scattered, and unplanned developments which, in addition to increasing infrastructure costs, energy consumption, and pollution resulting from motorized transportation, lead to the destruction of agricultural lands and forests (Keivani & Mattingly, 2007; Simon, 2008).

In this regard, Vij & Narain (2016) state that: “Urban expansion processes increasingly reduce access to common resources; because these resources are appropriated to support urban development.” This shows that land-use transformation in peri-urban areas not only erodes the natural environment but also absorbs and restricts collective assets and public resources along the path of development. In many countries, including the United States of America, Europe, and developing countries, this process has led to extensive conversion of agricultural and ecological lands into low-density residential and service developments, whether formal or informal (Birley & Lock, 1998; Barnes & Morgan, 2002; Allen, 2003; Castillo, 2003; Piorr et al., 2011).

Such changes, while creating unstable physical and environmental landscapes, intensify socio-spatial segregation in peri-urban areas and weaken the ecological and functional cohesion of these spaces.

The results of the code count in this category show that concepts such as functional pressure arising from township settlement, land-use changes, and the degradation of ecological functions had the highest frequency; something that indicates the main root of spatial segregation in peri-urban areas lies in the mechanisms of land-use transformation.
Overall, it can be said that the functions and activities influencing segregation in peri-urban areas are mainly derived from land-use changes; changes that are accompanied by the conversion of lands with ecological value into low-density developments, increased energy consumption, and intensified environmental pollution (Table 8). In total, land-use changes following pressures arising from urban growth not only weaken the ecological structure, but also, through population displacement and reduced equal access to space, lead to the intensification of social segregation.

Table 8. Functions and activities influencing segregation in peri-urban areas

Conceptual Codes	Intermediate Category	Main Category	Sources
Pressure arising from township settlement, ghettos, and gentrification	Competition between residential functions and ecological functions	Functions and activities influencing segregation	Tacoli (1998); Low Choy et al. (2008); Crankshaw (2009); Zasada (2011); Tavares et al. (2012)
Low-density and unplanned development	Expansion of consumer-oriented and non-efficient spaces		Firman (1997); Keivani & Mattingly (2007); Simon (2008); Vij & Narain (2016)
Conversion of agricultural and ecological lands into urban developments	Decline of environmental functions and increase of spatial instability		Birley & Lock (1998); Barnes & Morgan (2002); Allen (2003); Castillo (2003); Piorr et al. (2011)
Increase in infrastructure costs, energy consumption, and pollution	Physical and environmental impacts of unsustainable development		Firman (1997); Simon (2008); Vij & Narain (2016)

The examination of the themes related to the spatial structure shows that the inductive findings interact with the theoretical models of spatial segregation at several levels. At the first level, patterns such as physical separation, the concentration of services, and the persistence of the spatial hierarchy of activities overlap with the fundamental assumptions of urban ecology approaches and explanations based on spatial organization, and are regarded as confirmatory evidence. At the second level, findings such as the role of dispersed growth, automobile-oriented development, and spatial infrastructuralisation show that new patterns of peri-urban development produce new forms of segregation that classical theories are not capable of fully explaining; therefore, these results have a "modifying" aspect in relation to existing models. At the third level, some themes—such as the interaction between the weakness of public transport networks, everyday activity patterns, and the way spatial closure occurs in peri-urban neighborhoods—reveal dimensions that have been less developed in previous literature and therefore possess innovative value. These three levels show that the spatial structure of segregation is both a reflection of established theories and goes beyond them, having the capacity to offer new conceptual patterns.

Discussion and Conclusion

This study, by employing the method of qualitative content analysis and the systematic review of scientific sources, has succeeded in presenting a novel and comprehensive theoretical framework for explaining the phenomenon of segregation in peri-urban areas. What emerges from this study is a multilayered and intertwined picture of this phenomenon, which operates as a dynamic and self-reinforcing system. The essential innovation of this research lies in offering a systematic analysis of how the ontological and spatial dimensions interact, which distinguishes the proposed framework from other analytical models.
The ontological sphere of this phenomenon itself includes three dimensions, each of which is subtly interwoven with the other. The socio-functional dimension, centered on concepts such

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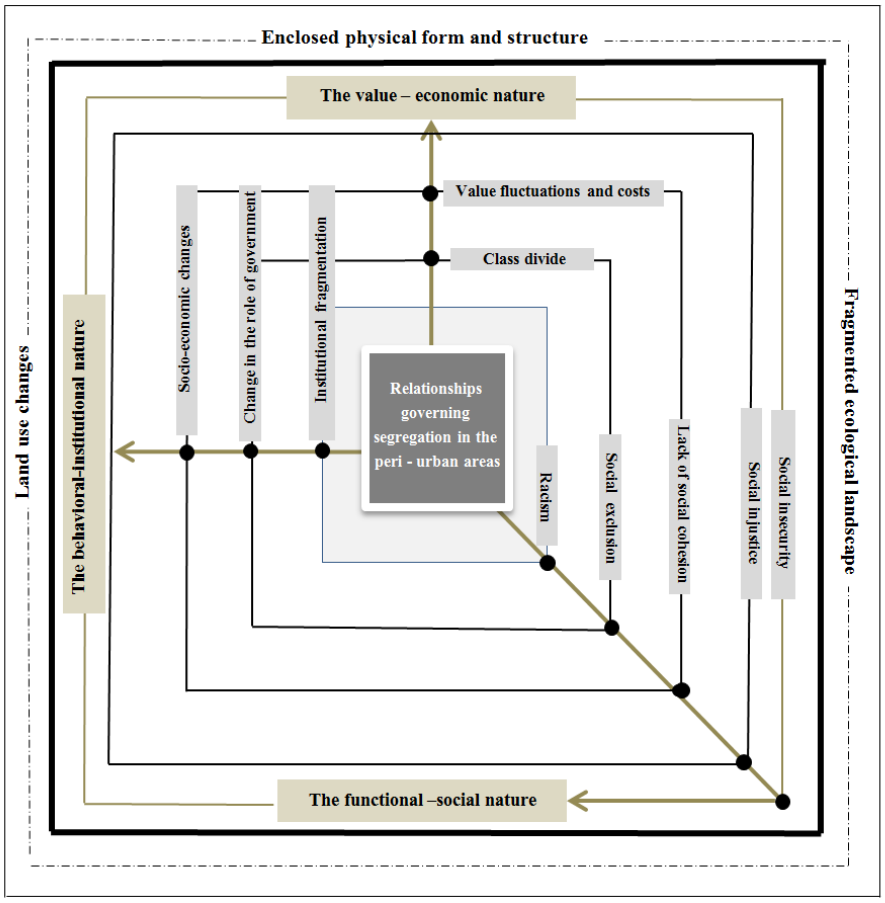
as discrimination and social deprivation, provides a context in which social gaps deepen and lead to the reduction of social cohesion. This reduction of social cohesion, in turn, provides the ground for the intensification of economic inequalities, which manifests in the value–economic dimension. At this stage, we witness the formation of deeper class gaps and value fluctuations, which themselves contribute to the reproduction of social deprivation.

This finding is consistent with parts of the human ecology model of Park and Burgess, which consider segregation as the product of competition and differentiation among groups, but it modifies it; because unlike the classical model, which considers the dynamics predominantly economic, the results of this research show that informal networks, status-based preferences, and the weakness of social cohesion play an important mediating role in intensifying gaps. This aspect has been less addressed in the classical literature and can be proposed as a theoretical extension.

In this context, the behavioral–institutional dimension acts as an intermediary link, in such a way that the policies and performance of governance institutions can both intensify this vicious cycle and, if an intelligent approach is adopted, lead to its moderation. What is noteworthy in this process is the manner in which these ontological dimensions manifest in the spatial arena, which itself results in the formation of three distinct but interconnected dimensions.

Figure 1: The governing relations of segregation in peri-urban areas



In accordance with the above diagram, the proposed theoretical framework outlines the governing relations of segregation in peri-urban areas in three main components. These components include the socio-functional, the value–economic, and the behavioral–institutional dimensions, each of which possesses its own specific characteristics.

In the socio-functional dimension, we observe phenomena such as racial discrimination, social deprivation, and the reduction of social cohesion. The value–economic dimension is

accompanied by class gaps and value fluctuations. Also, the behavioral–institutional dimension includes components such as institutional fragmentation and the change of the role of the state. These three dimensions ultimately manifest in three concrete forms in space: first in the form of enclosed physical form and structure, then in the fragmented ecological landscape, and finally in land-use changes. These spatial manifestations are the concrete embodiment of the same ontological processes that operate at different levels.

In comparison with the five-dimensional model of Massey & Denton, the results show that although some dimensions such as spatial inequality and social concentration are confirmed, the institutional and behavioral dimensions—especially the role of institutional fragmentation, the plurality of decision-making, and lifestyle preferences—appear as new components specific to the peri-urban context. This indicates that the classical model is not sufficient for analysing peri-urban areas and requires extension toward multilevel frameworks.

The proposed framework of this study is fundamentally significant from several perspectives. First, this framework is able to analyse the complex dynamics of segregation within an integrated system, in such a way that it not only identifies the different dimensions of this phenomenon but also explains how the interaction and mutual influence of these dimensions occur. This feature turns the present framework into an effective tool for understanding the depth of peri-urban issues.

The applications of this framework are very broad and diverse. From a policy perspective, this analytical model can serve as a basis for formulating integrated and comprehensive strategies. For example, by identifying leverage points in the complex system of segregation, effective interventions can be designed that simultaneously address the different dimensions of this phenomenon. For instance, the improvement of institutional governance (behavioral–institutional dimension) can lead to the reduction of economic gaps (value–economic dimension), which itself will result in the weakening of spatial enclosure patterns (physical–spatial dimension).

From a theoretical perspective, this framework represents an important step in moving from one-dimensional analyses toward systematic and multidimensional studies in the field of urban and regional studies. This analytical model can serve as a basis for developing more complex theories regarding spatial–social dynamics and open new horizons for researchers in this field. Compared with previous studies, what distinguishes this research is its integrated and systematic view of this phenomenon, which makes it possible to understand the complex connections between different dimensions. This is while many previous studies have only examined each of these dimensions separately without paying attention to their systematic interrelation.

Nevertheless, this research is not without limitations. The qualitative nature of the study and the impossibility of quantitatively measuring the relationships between variables are considered among the most important limitations. In addition, the focus on existing literature and the absence of extensive field studies create grounds for future research.

In practice, this framework can serve as a roadmap for planners and urban managers. By applying this model, it is possible to predict the cumulative impacts of different decisions and prevent the unintended intensification of segregation. Also, this framework provides a valuable tool for evaluating urban development policies and programs.

For future research, conducting comparative studies between different peri-urban areas, developing quantitative indicators for measuring the intensity and various dimensions of this phenomenon, and examining the role of different actors in shaping the dynamics of segregation can provide valuable research avenues. In addition, studying the impact of new technologies and digital transformations on segregation patterns can also open new horizons in this field.

What makes this framework especially valuable is its capacity for adaptation to different geographical–cultural contexts. Although this framework has been extracted from the study of

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global literature, its flexible structure allows for localization and adaptation to the specific conditions of each region. This feature turns the present framework into a universal tool for analysing local issues.

Overall, the findings show that while some mechanisms of segregation in peri-urban areas can be explained through the classical dimensions of global literature, an important part of them—especially the institutional and behavioral components—require extension and theoretical reconsideration. By highlighting this gap, this study offers a framework that, while relying on past theories, goes beyond them and proposes a multilevel and context-oriented interpretation. In conclusion, it can be said that understanding these complex relations not only leads to a deeper understanding of the phenomenon of segregation but also provides the basis for formulating intelligent and integrated strategies in addressing peri-urban issues. By presenting a comprehensive analytical framework, this study has taken a step in this direction and hopes to contribute to enriching the literature of this field and improving related policymaking.

Authors' Contribution

All authors have an equal contribution in writing the present research.

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Conflict of Interest

No conflict of interest has been declared by the authors.

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