

Residential Segregation, Housing Policy and Territorial Planning in the Basque Country (Spain)

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Received: 2024-02-15 | Final version: 2024-12-21

Abstract

Despite the growing economic disparity and its reflection in the territory through residential segregation, few studies relate residential segregation with the housing policy developed in the Basque Country. Therefore, this study aims to analyze residential segregation and examine its relationship with public housing policy. The Basque Country was selected as an instrumental case study due to its high level of public housing construction compared to the rest of Spain. A quantitative methodology was used focused on the statistical analysis of economic, social, and housing indicators. The Geo-Segregation Analyzer and ArcGIS software facilitated the measurement of segregation and its geographic visualization. Areas have been identified that concentrate a greater degree of vulnerability due to having municipalities with an industrial past that have been subjected to reconversion processes. Incipient trends of displacement of vulnerability in the most peripheral areas are also observed. However, no strong correlations have been found between a greater provision of public housing and greater segregation, although geographical associations have been found in certain areas. The study concludes that the integration of housing policy in territorial planning could mitigate segregation. Likewise, adapting the promotion of public housing based on levels of vulnerability, avoiding excessive concentrations and considering location factors, can promote social equity throughout the territory.

Keywords: social cohesion; vulnerability; spatial distribution; territorial planning

Citación

Dávila-Cabanillas, N., & Aguado-Moralejo, I. (2025). Residential Segregation, Housing Policy and Territorial Planning in the Basque Country (Spain). *ACE: Architecture, City and Environment*. 19(57), 12802. <https://doi.org/10.5821/ace.19.57.12802>

Segregación residencial, política de vivienda y planificación territorial en el País Vasco

Resumen

A pesar de la creciente disparidad económica y de su reflejo en el territorio a través de la segregación residencial, pocos estudios relacionan la segregación residencial con la política de vivienda desarrollada del País Vasco. Por ello, este estudio tiene como objetivo analizar la segregación residencial y examinar su relación con la política de vivienda pública. Se seleccionó el País Vasco como estudio de caso instrumental debido a su alto nivel de construcción de viviendas protegida en comparación con el resto de España. Se utilizó una metodología cuantitativa centrada en el análisis estadístico de indicadores económicos, sociales y de vivienda. Los softwares Geo-Segregation Analyzer y ArcGIS facilitaron la medición de la segregación y su visualización geográfica. Se han identificado áreas que concentran mayor grado de vulnerabilidad debido a contar con municipios de pasado industrial que se han visto sometidos a procesos de reconversión. También se observan tendencias incipientes de desplazamiento de la vulnerabilidad en los más periféricos. Sin embargo, no se han encontrado fuertes correlaciones entre una mayor provisión de viviendas protegida y una mayor segregación, aunque se haya podido encontrar asociaciones geográficas en ciertas áreas. El estudio concluye que la integración de la política de vivienda en la planificación territorial podría mitigar la segregación. Asimismo, adecuar la promoción de vivienda pública en función de los niveles de vulnerabilidad, evitando concentraciones excesivas y considerando factores de localización, puede promover la equidad social en todo el territorio.

Palabras clave: cohesión social; vulnerabilidad; distribución espacial; planificación territorial

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1. Introduction

Globalization, economic liberalization, the dismantling of welfare systems and the reorganization of labor markets are causing an economic polarization of the population that has its spatial reflection in an increasingly evident residential segregation (Musterd et al., 2017). Understanding the causes of residential segregation is essential, but the actual levels of segregation must be previously known and measured, a task that entails a high degree of complexity due to the numerous factors that influence it (García-Almirall, Fullaondo, & Frizzera, 2008; Linares, 2013; Nel-lo & Sabatini, 2022). Residential segregation is often articulated through the real estate market, and hence, housing and the way to access it are key elements to reduce it (de Kam, Needham, & Buitelaar, 2014). An active housing policy can meet the demand of those citizens who cannot afford it in the free market, thus contributing to improving the quality of life and promoting a more just and inclusive society (Danermark & Jacobson, 1989; DeLuca, Garboden & Rosenblatt, 2013). However, sometimes, the public housing policy, which is proposed as a solution, can have effects contrary to those intended, since the concentration of public housing in certain areas could lead to a greater concentration of vulnerable population (Marcus, 2007; van Ham & Manley, 2012; Baldwin, Tammaru & van Ham, 2018; Piasek et al, 2023).

The issue, which has sparked extensive research in other territorial contexts, however, has just a few studies on the matter in the Autonomous Community of the Basque Country (hereinafter, CAPV) (Rodríguez, Martínez & Guenaga, 2001; Lavía, 2008; Aguado, 2021; Antolín-Iria & Izaola, 2021). This may be related to the presence of relatively low levels of segregation, although in recent years an increase in the social gap between rich and poor has begun to be perceived (Aguado, 2021; Fernández, Ochoa de Aspuru & Ruiz, 2021; Echebarria, Aguado & Barrutia, 2023). Furthermore, the Basque Government has a long history of promoting public housing through the Housing Master Plans and, more recently, through broader legislative development, both with the establishment of standards within the Land and Urban Planning Law of the Basque Country of 2006, as well as with the introduction of the subjective right to housing in Law 3/2015, of June 18, on Housing, which regulates the right to enjoy decent and adequate housing. For this reason, our study aims to contribute to covering this gap in the patterns of residential segregation in Basque municipalities, acknowledging the growing relevance of segregation and its profound territorial effects and contrasting it with the effects that housing policy can have on said segregation.

With this diagnosis, we aim to raise awareness about the problem of residential segregation, with the objective of providing guidance for the development of Basque housing policy and its integration through the territorial planning instruments of the Basque Country. This article, therefore, has a twofold objective. First, to measure the levels of residential segregation at the municipal level, considering that segregation is a multidimensional process influenced by different factors. The analysis has been conducted at the municipal level to capture differences between the situations of various municipalities, given that housing policy is directly linked to urban planning, which sets housing standards and is typically implemented at the municipal scale. While we acknowledge the value of conducting analyses at finer spatial scales to identify intra-urban segregation, this falls outside the scope of the present study, which focuses specifically on inter-municipal dynamics. Secondly, to contrast these levels of segregation with the supply of public housing to identify what is the relationship between the concentration of public housing and the levels of residential segregation. From this second objective derives the central hypothesis of the study, which posits that municipalities with a higher concentration of public housing are likely to exhibit greater levels of residential segregation. This hypothesis is based on the premise that the spatial distribution of public housing can influence patterns of socioeconomic and demographic clustering.

The rest of the work is structured as follows. Firstly, the theoretical framework that supports the study is established, delving into the multidimensionality of residential segregation, the difficulty of its measurement and the social, economic and political factors that influence the spatial distribution of population groups in cities. Secondly, the methodology is described, presenting the study area, the method used and the sources of information. Thirdly, various indicators widely used in measuring segregation are analyzed, as well as indicators that provide a general vision of the situation of public housing in the municipalities of the CAPV.

Next, a section discussing the results of the analysis is introduced. Finally, the main conclusions of the research are presented, highlighting the importance of sectoral territorial planning in the Basque Country concerning public housing. These conclusions emphasize the need to address the fragility of municipalities in terms of residential segregation.

2. The role of public housing policies in residential segregation

Residential segregation has a detrimental impact on the integration of vulnerable groups, exacerbating social issues and undermining territorial cohesion. Consequently, countering this phenomenon has become a political imperative (van der Meer & Tolsma, 2014; Cassiers & Kesteloot, 2012). However, governmental efforts to address segregation face significant challenges due to dwindling resources resulting from the retrenchment of the welfare state and neoliberal austerity measures (van Ham & Tammaru, 2016). This situation disproportionately affects vulnerable communities, exacerbating socio-spatial segregation at various levels, from neighborhoods to entire urban areas (Gray & Barford, 2018; van Ham et al., 2021). Furthermore, stringent budgetary constraints have left many local authorities with increased responsibilities but insufficient financial means to provide essential public services or implement measures to combat segregation. As urban policies undergo a shift, public housing initiatives appear to be among the last remnants of a broader trend toward global neoliberalization, with diminishing flexibility (Giband, 2018).

Recent shifts in occupational class structures also contribute to understanding segregation dynamics, often intertwined with gentrification processes (Smith, 2012). These changes can be contextualized within a historical trajectory from pre-industrial cities, characterized by stark class divisions, to industrial societies with hierarchical class structures, and finally to today's more diversified and stratified post-industrial configurations (Hamnett, 2021). Ethnic segregation represents a contemporary phenomenon shaping population distribution patterns. While ethnic segregation was historically prevalent in U.S. and European cities with substantial international immigration until the late 20th century, current trends show an intensification of ethnic segregation in southern European countries like Spain, which are experiencing significant migration flows. However, the spatial clustering of ethnic groups often mirrors traditional socioeconomic segregation, underscoring existing socioeconomic disparities (Jiménez et al., 2020).

Housing systems represent another significant factor influencing segregation, contributing to differences across various territorial contexts (Musterd et al., 2017). Within cities, the polarization of the housing market, characterized by price disparities among different areas, shapes settlement patterns (Fields & Hodkinson, 2018). Notably, stark differences emerge between affluent urban expansion areas, landscaped suburbs, and historic inner cities (Antoniucci & Marella, 2018). Additionally, there's a rising prevalence of enclaves that segregate social classes and discourage interaction among population groups. These enclaves range from ghettos, fostering exclusion and involuntary segregation (Gans, 2008), to gated communities, exemplifying extreme instances of voluntary residential segregation (Atkinson & Flint, 2004). Increasing housing costs further exacerbate income segregation in Europe, displacing lower-income individuals to more affordable areas (Ismail, Warsame & Wilhelmsson, 2021).

Various factors, including household diversification, lifestyle differences, and varying working conditions, influence residential preferences. Consequently, housing prices and affordability emerge as primary markers of inequality within and between cities (Baker et al., 2016). The presence of affordable housing in an area can impact the valuation of surrounding properties, although this effect varies based on factors such as concentration, design, and neighborhood characteristics (Ismail et al., 2021). Segregated spaces may perpetuate inequality by offering advantages and opportunities to certain groups (Domínguez, Leal & Goytre, 2012). Consequently, major metropolises witness a process of suburbanization of poverty, driven by competition for central spaces by high-income professionals, resulting in the displacement of lower-income populations and migrants to metropolitan outskirts (Martori & Hoberg, 2004; Hamnett, 2021; Ariza de la Cruz & Sorando, 2023).

Nonetheless, the COVID-19 pandemic accelerated a parallel trend of suburbanization among more affluent households, who left the city in search of larger homes and lower-density environments, as they were more likely to have access to remote work (Biljanovska & Dell'Araccia, 2023). In some cities, this shift altered traditional price gradients, reducing prices in central areas while driving up those in the suburbs. This phenomenon, however, was not universal (Gripsiou & Bergouignan, 2022). In certain metropolitan areas, its impact was more subdued or temporary, reversing as pandemic conditions improved. Meanwhile, the literature on the suburbanization of poverty remains more extensive (Banabak, Kadi & Schneider, 2024), often linking this process to gentrification, which continues to push disadvantaged groups to the outskirts of metropolitan areas. The housing market reinforces differential pricing, leading higher-income groups to central urban areas, privileged neighborhoods, and gated enclaves, while lower-income groups are pushed to urban peripheries, illustrating dynamic and evolving geographies of inequality (Nel-lo & Sabatini, 2022).

To address the issue of segregation, public housing development policies stand out as one of the most commonly utilized instruments by governments. Additionally, strategies extending beyond housing scale, aiming to improve the overall habitat, are also proposed as solutions. Urban regeneration initiatives and the enhancement and expansion of facilities aim to revitalize urban spaces and the livability of disadvantaged areas. Often, these vulnerable areas are located in the central parts of cities, which have become outdated and are in need of revitalization. This confirms the strong correlation between economic polarization, social inequality, and their spatial manifestation, primarily driven by trends in the real estate market (Antoniucci & Marella, 2018).

Nevertheless, the role of public housing policies in shaping residential options is frequently overlooked (Verdugo & Toma, 2018). At times, the public housing solutions proposed may even have counterproductive effects. Concentrating public housing in specific areas can lead to contradictory outcomes and result in a high concentration of vulnerable populations. Thus, while public housing intervention can serve as a tool to mitigate socio-residential vulnerability, it can also inadvertently solidify it (Piasek et al., 2023). Public interventions in housing typically align with three main objectives: firstly, promoting the diversification of housing types and tenures in disadvantaged areas to combat spatial segregation; secondly, addressing potential adverse effects of spatial segregation by establishing criteria and procedures to regulate public housing allocation; and thirdly, implementing area-based initiatives aimed at rejuvenating housing stock and fostering social services and initiatives to enhance social capital at the neighborhood level (Bricocoli & Cucca, 2016). From an academic perspective, there is a concerted effort to comprehend the relationship between residential segregation, the housing market, and the promotion policies of public housing (Marcus, 2007; van Ham & Manley, 2012; Baldwin et al, 2018).

In Europe, the impact of public housing on residential segregation exhibits ambiguity, as the design, concentration, and scale of housing projects can influence segregation positively or negatively. Small, dispersed public housing initiatives may mitigate segregation, whereas the concentration of vulnerable populations in larger projects can exacerbate segregation by reinforcing neighborhood homogeneity. This notion is supported by research conducted by Verdugo & Toma (2018) regarding the role of public housing in the spatial segregation of non-European immigrants in France. Their findings suggest that an increase in the proportion of immigrants residing in public housing led to a moderate rise in average segregation levels in certain French cities, primarily driven by large public housing projects accentuating segregation to some extent.

Nevertheless, beyond its role in segregation, public housing plays a critical role as a social determinant of health, offering not only physical shelter but also promoting security, autonomy, and enhanced mental well-being, particularly among vulnerable populations. For many individuals, especially those transitioning from the private rental market to subsidized housing, it alleviates financial strain, strengthens social connections, and fosters a less stressful living environment (Beck, 2013). These benefits underscore its essential role in fulfilling the right to adequate housing and addressing the broader socio-economic needs of the populations it serves.

In Spain, which possesses one of the smallest stocks of public and subsidized housing relative to Europe, access to public housing is highly restricted (Caravantes & Romero, 2021). Furthermore, the heterogeneous socioeconomic profiles of individuals eligible for public housing, coupled with the modest scale of urban projects and absence of spatial clustering, mitigate the occurrence of residential segregation (Gallego-Valadés et al., 2021). For instance, in Valencia, Gallego-Valadés et al. (2021) observe a dispersed distribution pattern of public housing across the municipality, which discourages the formation of large pockets of low-income populations. Nonetheless, there's a prevailing trend toward the peripheralization of public housing supply. While certain census sections exhibit simultaneous presence of low-income populations and public housing, indicating a degree of poverty concentration, this effect is limited and not representative of the entire city. Public housing, to varying extents, is present across neighborhoods of all socio-residential profiles.

In the Basque Country, Fullaondo et al. (2014) noted a higher demand for subsidized housing among immigrant populations, yet access remains limited due to economic eligibility criteria. In Bilbao specifically, Antolín & Fernández-Sobrado (2020) observed a significant proportion of new housing construction dedicated to public housing, primarily concentrated in peripheral areas. This has contributed to urban fabric fragmentation, exacerbating socio-spatial segregation. Conversely, rehabilitation policies targeting central and adjacent areas have attracted middle-class and young households, gradually altering the demographic composition of these neighborhoods. Consequently, Bilbao's transformation model in recent decades has entrenched a dual socio-spatial structure marked by stratification, with some areas witnessing income growth while others concentrate low-income populations and limited upward social mobility (Antolin & Izaola, 2021).

Unlike other European countries, where the concept of affordable social housing is deeply rooted, Spain has favored the construction of homes for private ownership, promoting the real estate sector as a driver of economic growth. This has led to a structural deficit in both public and private rental housing, limiting access to adequate housing for the most vulnerable segments of the population. State intervention, focused on ownership, has facilitated housing access for a broad segment of the population without adequately considering income levels, which has hindered the establishment of a solid and equitable welfare model (Pareja Eastaway & Sánchez Martínez, 2012). This national trend is also evident in the Basque Country, where housing policies have also been shaped by similar priorities, impacting both subsidized and private housing sectors. Moreover, the housing policy of the Basque Government primarily focused on fostering homeownership rather than addressing the housing needs of the most vulnerable groups, further influences this trend. This is particularly evident in access to subsidized housing (VPO) and rental policies, which serve as alternatives to ownership (Antolin & Izaola, 2021).

Given that spatial configuration processes vary based on territorial context, caution is warranted when proposing policy recommendations, as findings from other regions may not always be applicable (Cassiers & Kesteloot, 2012). Therefore, the effectiveness of policies aimed at reducing segregation hinges on understanding local characteristics and dynamics (Mingione, 2004). Thus, developing a comprehensive diagnosis of segregation is crucial as a basis for designing public policies. These policies will naturally differ based on administrative competencies in the housing market, analysis of the causes of residential segregation, and population dynamics, particularly those related to immigration flows.

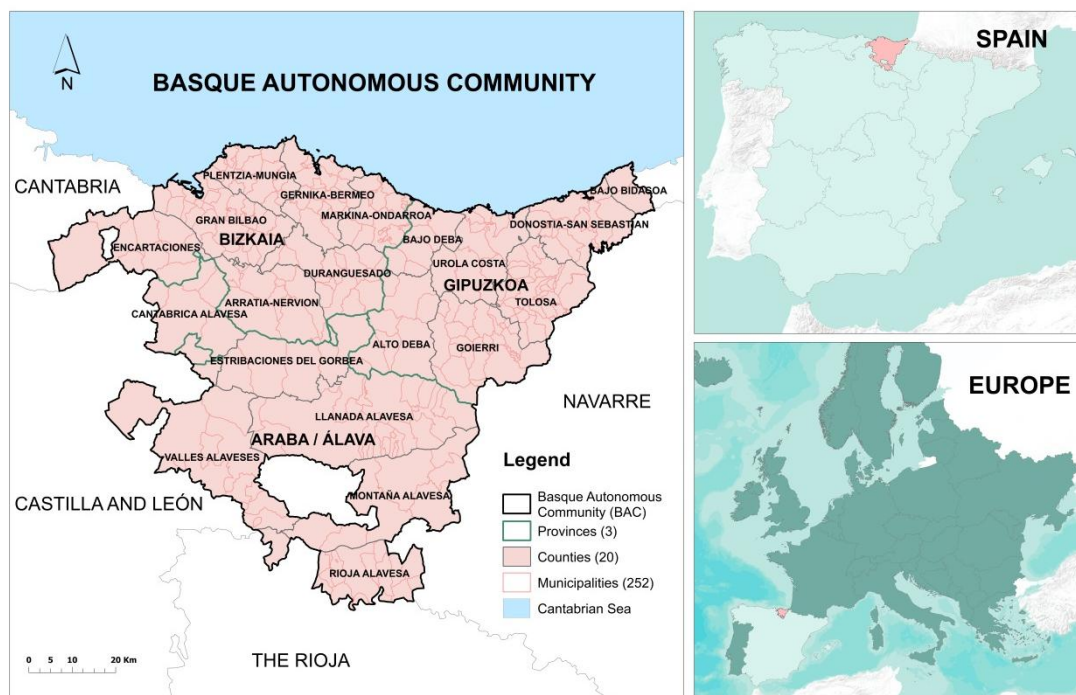
3. Methodology

3.1 *Area of study: The Autonomous Community of the Basque Country*

The Basque Country is situated in the northern region of Spain, bordering the autonomous regions of Cantabria, Castilla y León, La Rioja, and Navarra (Figure 1). At its northernmost point, it shares a border with France and the Cantabrian Sea. With a population of 2,191,613 inhabitants and a surface area of 7,234 km², it is a densely populated territory (302.9 inhabitants/km²) (Eustat, 2022).

Compared to other Spanish autonomous regions, its economic situation is privileged, boasting the lowest unemployment rate in the country (INE, 2022b), and a per capita GDP of 36,421 euros, significantly higher than the national average of 28,748 euros (INE, 2022a). This competitive advantage can be attributed largely to the position of its productive sector, which has a significant presence of industry and high-value-added services. Additionally, the Basque Country benefits from a specific tax regime known as the Basque quota, granting it autonomy in managing many of the taxes collected.

Figure 1. Territorial configuration of the Basque Country



Source: Own elaboration based on GeoEuskadi.

Administratively, the Basque Country is divided into three provinces: Alava, Gipuzkoa, and Bizkaia, with their respective capitals being Vitoria-Gasteiz, Donostia/San Sebastián, and Bilbao. Moreover, the territory is organized into 20 counties, which serve as intermediate entities between governments. The region consists of 252 provinces and 252 municipalities. Like other Autonomous Communities, since the approval of the Spanish Constitution in 1978, it has been responsible for land planning and housing policies. In the case of the Basque Country, these policies began with the approval of Law 4/1990, dated May 31, 1990, on Territorial Planning in the Basque Country, which led to the subsequent development of the Territorial Planning Guidelines in 1997, known as DOT, constituting the primary strategic document in this field.

Another significant milestone in land policy was the approval in 2006 of the Land and Urban Planning Law of the Basque Country. This law emphasizes, in its statement of motives, the interest in combating speculation and ensuring decent housing for all citizens. To achieve these objectives, among other measures, it specifically proposes high standards for subsidized housing. It obliges municipalities with more than 3,000 inhabitants to allocate 75% of the urban building capacity for residential use to subsidized housing on developable land, and in the case of urban land, 40% of the increase in building capacity.

Housing policy, initially articulated through the Housing Master Plans, established strategic objectives but lacked legal binding. Later, Law 3/2015, dated June 18, on Housing, established more specific and legally enforceable measures to protect the most vulnerable people (low-income individuals, people with disabilities, victims of terrorism, and victims of gender violence). It also recognized the subjective right to housing for those lacking sufficient economic resources.

Additionally, it committed to promoting social housing and proposed taxing vacant housing with the intention of bringing a significant volume of underutilized housing to the market.

We chose the Basque Country as our study area due to the limited research on how public housing influences residential segregation levels in Spain. Despite Spain's historical promotion of a relatively high percentage of public or public housing since the Franco regime, much of it has been disqualified and transferred to private ownership, resulting in a significantly lower percentage compared to free housing. In contrast, in the Basque Country, the Basque Government has stipulated that subsidized housing built from 2003 onwards must have a permanent qualification and cannot be privatized. This, along with the high standards required, leads to higher housing volumes than in the rest of Spain. However, it is important to observe whether this supply of subsidized housing is evenly distributed throughout the Basque Country or whether there is a high concentration that is generating negative impacts on the segregation of the most vulnerable classes.

3.2 Sources of information and data

Table 1. Selection of indicators

Dim.	Indicator	Definition (unit of measure)	Year	Source
Economic	Income	Ratio between total personal income and the population aged 18 and over. euros/inhabitant	2020	Personal and family income statistics, Eustat.
	Unemployment	Unemployed population with respect to active population. %	2020	Lanbide-Basque Employment Service Employment.
	Poverty	Number of beneficiaries of Income Guarantee Income, per 1,000 men (‰)	2020	Municipal census, INE; Lanbide-Basque Employment Service.
		Number of housing units benefiting from Social Emergency Assistance (AES), per 1,000 inhabitants. (‰)	2020	Directorate of Social Inclusion, Department of Employment and Social Affairs (based on administrative records managed by the municipalities).
Social	Migratory status	Foreign population in relation to the total population (%): Segregation index and Gini index	2020	Foreign population: Municipal statistics of inhabitants, Eustat. Indexes elaborated using the Geo-Segregation Analyzer program.
		Location quotient by nationality	2020	Nationalities: Municipal statistics of inhabitants, Eustat. Own elaboration using the Geo-Segregation Analyzer program.
Residential/ housing policy	Subsidized housing	Subsidized housing per 1000 inhabitants	2020	Building and Housing Statistics, Basque Government.
	Social housing	Social housing per 1000 inhabitants	2020	Basque Housing Observatory, Basque Government.

Source: Own elaboration.

A battery of six indicators has been constructed, encompassing economic, social, and residential dimensions. Within the economic dimension, income level, unemployment rate, and poverty levels are considered. In the social dimension, an indicator measuring immigration is included.

Finally, in the residential dimension, indicators related to housing policy have been considered, such as the concentration of subsidized housing in its two modalities: general regime and specific regime, or social housing.

The compilation of information and construction of the indicator database took place in the year 2022, and all variables are referenced to the last year of available information at that time. Most of the data comes from Udalmap, a digital platform that provides geographical and statistical data on the municipalities of the Basque Country. Udalmap is an open-source system of integrated territorial information designed to offer public access to a comprehensive dataset of 144 indicators across 251 municipalities. It aims to facilitate the analysis and understanding of the social, economic, and sustainability factors shaping each Basque municipality. However, the database relies on the following statistical sources: Municipal Statistics on Inhabitants (Eustat), Municipal Statistics on Activity (Eustat), Statistics on Personal and Family Income (Eustat), Municipal Statistics on Housing (Eustat), and Public housing promotions (Basque Housing Observatory).

The following table (Table 1) lists the selected indicators along with their respective variables, the unit of measurement, the date of the last data provided, and the sources and statistical agencies providing them.

3.3 *Research method*

For the calculation of some indicators, particularly those related to migration status, we utilized Geo-Segregation Analyzer, a software capable of handling geospatial data layers in ESRI Shapefile format. This software provides a report containing the calculated indices, but these results are relative and researchers should assess them within the context of the study. Geo-Segregation Analyzer has been employed in segregation quantification studies in cities such as Madrid, Barcelona, and Seville (Palacios & Vidal, 2014), in Lleida (Aguilar, 2015), in medium-sized cities of the province of Buenos Aires (Linares et al., 2016), Berlin (Blokland & Vief, 2021), Moscow (Akhmetzyanova, 2015), among others.

To visualize the resulting indicators, we employed the ArcGIS program. The majority of the indicators are represented by symmetric intervals around the mean (standard deviation). This method proves useful for identifying extremes or outliers that deviate significantly from the central tendency of the selected variable.

4. Analysis: Quantitative Indicators of Residential Segregation in Basque Municipalities

4.1 *The Economic Dimension*

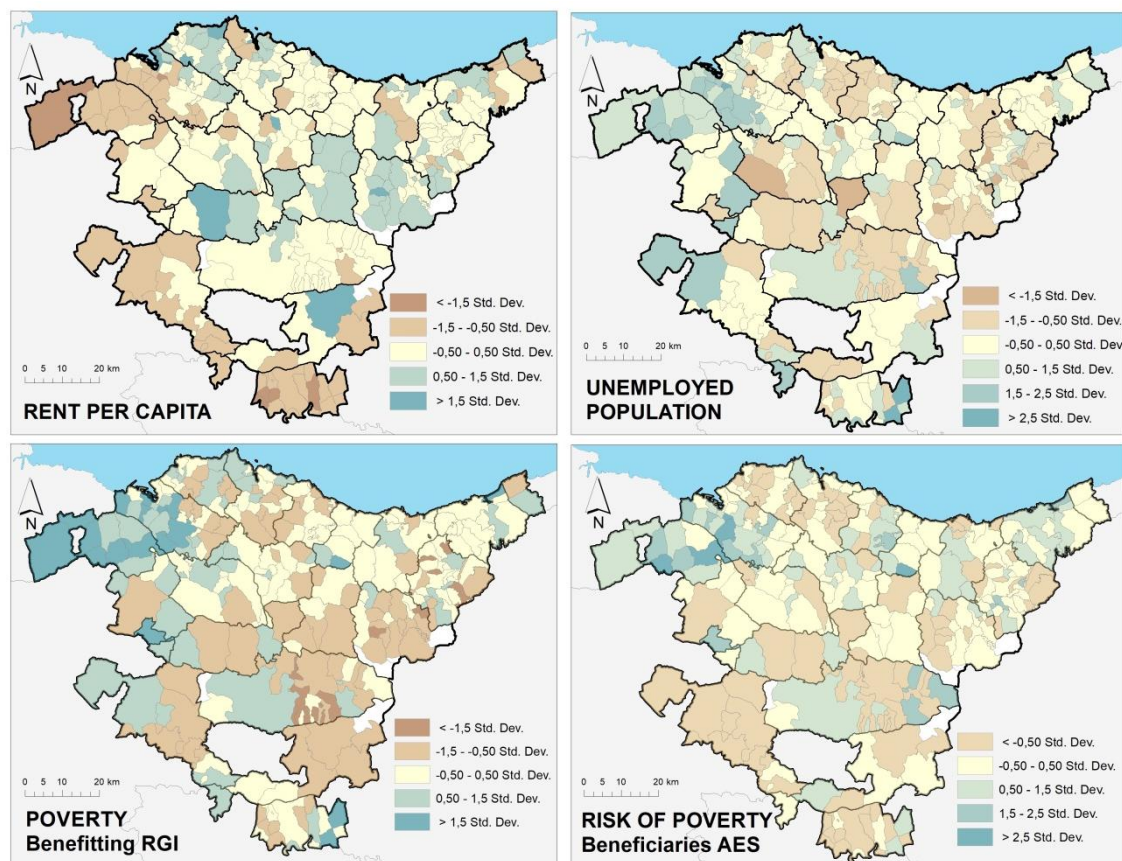
Figure 2 provides a spatial representation of economic variables across the municipalities of the CAPV, employing standard deviation intervals to highlight deviations from the regional mean and facilitating the identification of economic disparities. A higher value (green/blue shades, > 0.5 or > 1.5 standard deviations) indicates a stronger presence of the variable compared to the regional mean, highlighting areas with above-average income, unemployment, or poverty risks, depending on the map. Conversely, lower values (brown shades, < -1.5 standard deviations) denote areas with below-average levels of the variable, such as lower unemployment rates or lower dependency on social support.

Income level is a key factor influencing residential choices, often influenced by housing prices in each area (Reardon & Bischoff, 2011; Tammaru et al., 2018). Upon analyzing the distribution of average personal disposable income across the municipalities of the Basque Country (Figure 2), we observe a notable concentration of municipalities with lower income levels in the Rioja Alavesa region and the Encartaciones, both characterized by their rural nature. In Bizkaia, municipalities on the Left Bank of Greater Bilbao, historically characterized by industrial activity, also exhibit lower income levels, while in Gipuzkoa, several peripheral municipalities of Donostia-San Sebastián are among those with lower incomes.

This indicates a pattern of suburbanization of poverty (López & Aguilar, 2020; Torrado, Duque-Calvache & Noguera Zondag, 2021), with lower-income households concentrated in the outskirts of the capital of Gipuzkoa. Moreover, greater economic vulnerability is evident in the more remote municipalities of the Basque territory, with a predominance of municipalities with incomes falling within the first and second groups in the regions of Rioja Alavesa, Valles Alaveses, Cantabria Alavesa, and Encartaciones.

Another indicator reflecting the degree of economic vulnerability of municipalities is the unemployment rate. Numerous studies in other territorial contexts have shown that populations residing in segregated environments face greater difficulties in labor market integration and, consequently, in social integration and advancement (Molinatti, 2013; Niembro, Guevara & Cavanagh, 2019; Delmelle, Nilsson & Adu, 2021; Tammaru, Sinitsyna et al., 2021). Residential segregation generates a cycle wherein the unequal distribution of income in neighborhoods restricts residents' labor opportunities, affecting other aspects of daily life. This process is perpetuated across successive generations, as segregation also influences other domains such as education, the environment, or the labor market, contributing to the perpetuation of conditions of vulnerability that, in turn, influence decisions regarding place of residence (Krysan & Crowder, 2017; Tammaru, Knapp et al., 2021).

Figure 2. Spatial Segregation According to Economic Status



Source: Own elaboration based on the Udalmap database.

In the Basque Country, although the overall situation is more favorable than in many other Spanish autonomous communities, differences of 15 points in unemployment levels, calculated as the percentage of the unemployed population relative to the active population, are observed between the most and least affected municipalities. Generally, unemployment is concentrated in areas dominated by single industries, particularly evident in Alava, where municipalities adjacent to the capital (Llodio, Amurrio, and Salvatierra/Agurain) rank among the top ten municipalities with the highest unemployment rates in the Basque Country.

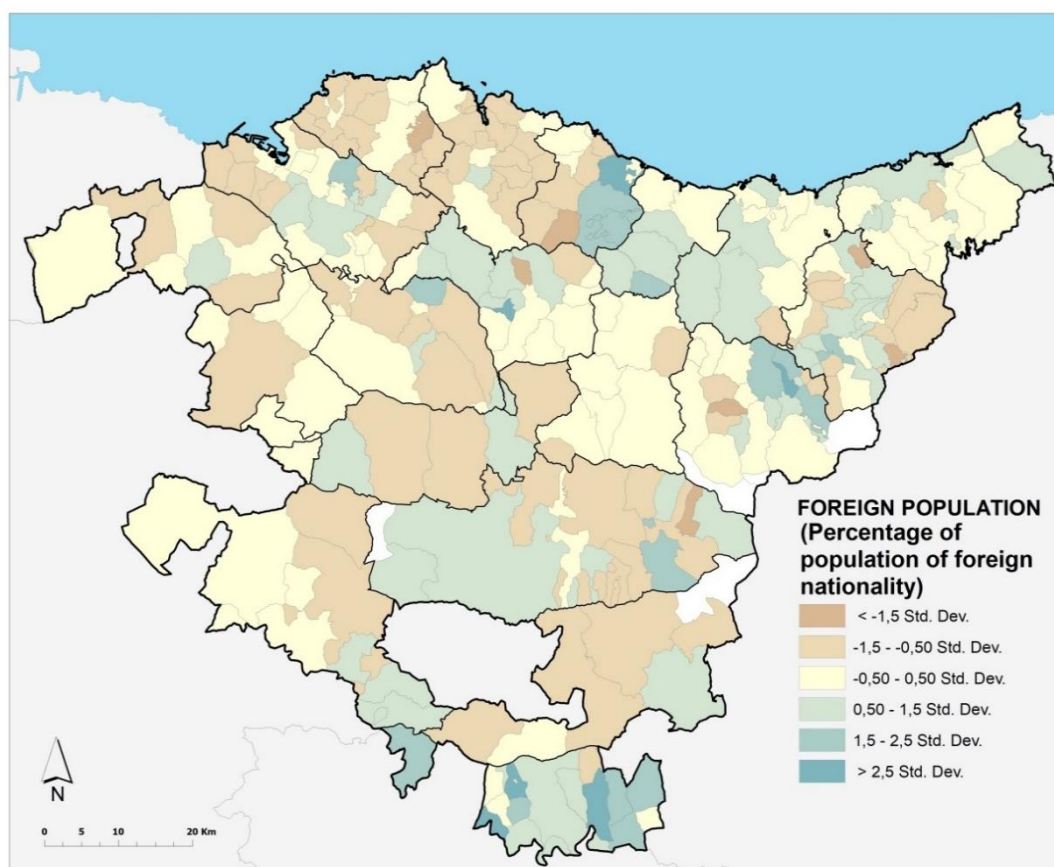
This group also includes two municipalities in Rioja Alavesa (Oyón-Oion and Labastida/Bastida). Conversely, no municipality in Gipuzkoa ranks among the top twenty with the highest unemployment rates in the Basque Country. This suggests a more balanced economic structure and lower labor market distress in Gipuzkoa, with its diversified economy and strong industrial base potentially contributing to its resilience and mitigating unemployment disparities.

Despite the Basque Country's considerable distance from the levels of poverty and inequality prevalent in the broader Spanish context (Sanzo, 2015), two indicators—the number of individuals benefitting from the Income Guarantee Income (RGI) and the number of cohabitation units benefitting from Social Emergency Aid (AES)—enable us to discern the spatial concentration of poverty. The RGI constitutes an economic subsidiary benefit targeted at individuals who, considering the income and assets of their cohabitation unit, lack adequate economic resources to cover basic needs and those arising from processes of social and labor insertion. On the other hand, AES represents non-periodic economic benefits intended for individuals with insufficient resources to meet specific, ordinary, or extraordinary expenses, serving as a tool to prevent, address, or alleviate situations of social marginalization. We view the former as indicative of current poverty levels, while the latter signifies the risk of poverty.

According to both indicators, it is apparent once again that municipalities in the Encartaciones and Rioja Alavesa regions, alongside a cluster of municipalities in Greater Bilbao, exhibit a high number of beneficiaries of both the RGI and the AES. Furthermore, it is evident that major population centers, including the three Basque capitals, harbor significant pockets of population experiencing poverty.

4.2 Social Characterization: Immigration and Educational Attainment

Figure 3. Percentage of population of foreign nationality

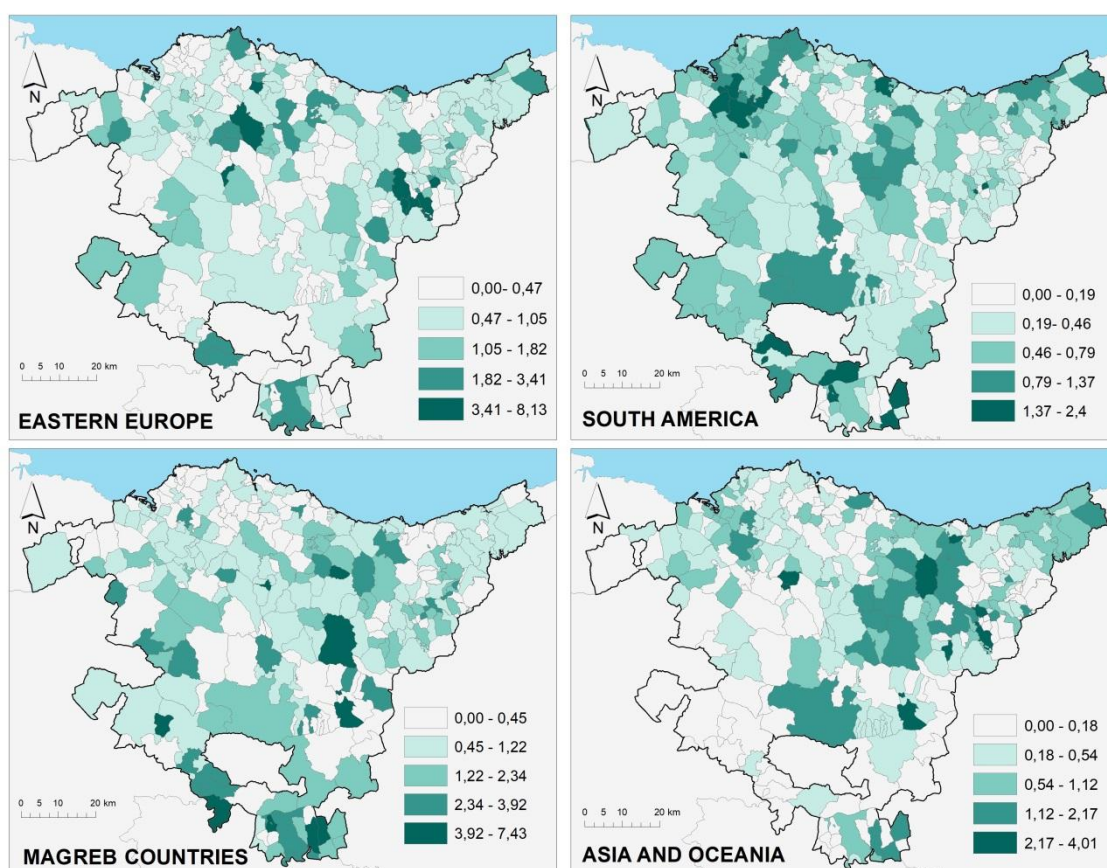


Source: Own elaboration based on Udalmap database.

In Spain, ethnic segregation has not been as pronounced as in other countries due to the relatively late arrival of international migration. However, starting in the last decade of the 20th century, the country began to experience international immigration, leading to the emergence of initial processes of ethnic segregation. The Basque Country still exhibits relatively low percentages of foreign population in comparison to the total population (Figure 3), with only three municipalities surpassing 15% of foreign-origin population – Ordizia, Lanciego, and Baños de Ebro– (a detailed map of the municipalities is provided in the annex to facilitate their location). Municipalities across the territory host foreign populations ranging from 10% to 15%, with many characterized by the presence of industrial estates and a significant number of foreign residents.

The concentration of foreign population in certain municipalities can be attributed to the presence of industrial activity (such as in Vitoria-Gasteiz, Zamudio, Irun, Amorebieta, Igorre, Loiu, Agurain, Alegria-Dulantzi, or Ribera Baja). Additionally, in the Rioja Alavesa region, closely linked to the vineyard landscape, the high levels of foreign population concentration can be explained by the demand for inexpensive labor in the wine industry.

Figure 4. Concentration of the Immigrant Population According to Nationality. Location Quotient



Source: Own elaboration based on Udalmap database.

Considering the origin of the immigrant population (Table 2), both the Segregation index and the Gini index indicate that concentration levels are not excessively high for any origin, as these indexes are far from unity (Figure 4). However, the population from Eastern Europe exhibits a more unequal spatial distribution, closely followed by the population from Maghreb countries. When examining the location quotients, commonly utilized in studies of migration-based segregation (Aguilar, 2015; Palacios & Vidal, 2014; González, 2019), small clusters of municipalities with elevated values emerge, particularly in the regions of Goierri (Arama, Ezkio-Itsaso, Ordizia, and Zegama) and Rioja Alavesa (Elciego, Elvillar, Laguardia, and Villabuena de Álava)

However, in these same areas, there are municipalities with zero location quotients, indicating that they do not host foreign populations. Since these municipalities are sparsely populated, the absence of foreign residents is mainly attributed to insufficient housing supply, particularly due to the predominance of traditional housing types, which are often intended as second residences or are in poor condition (Aguado-Moralejo, Dávila-Cabanillas & Espie, 2024), and the lack of new construction or properties available for sale or rent. As a result, potential foreign workers might prefer to reside in nearby municipalities with better housing options or easier access to services and infrastructure.

Table 2. Segregation Index and GINI

NACIONALITY	SI	GINI
Eastern Europe	0.2240	0.3539
Magreb Countries	0.2385	0.3349
South America	0.2085	0.2733
Asia and Oceania	0.2124	0.2882

Source: Own elaboration based on the Udalmap database.

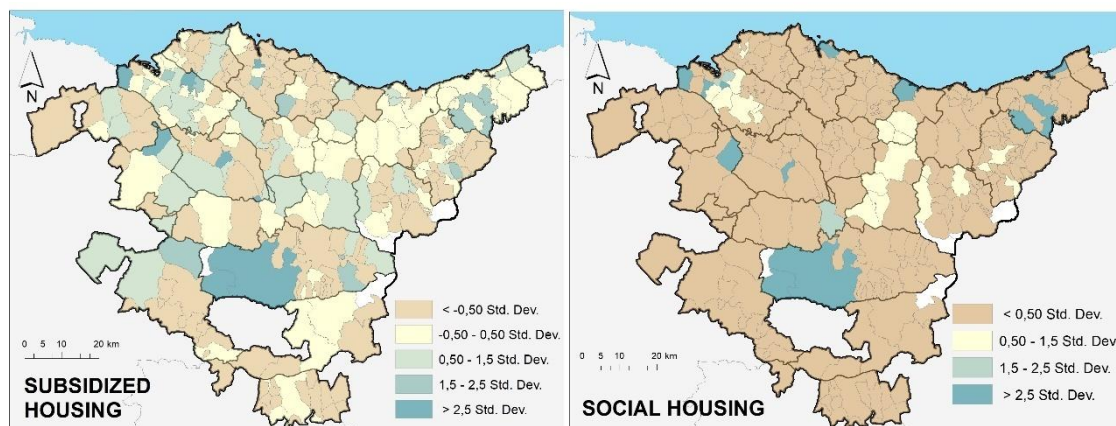
4.3 Housing Policy

In Spain, the social housing model does not follow the same guidelines as the systems in Northern and Central Europe, where social housing is conceived as affordable, rental housing managed by public or non-profit entities, under strict state regulation (Trilla & Bosch, 2018). In contrast, in Spain, two main types of protected housing are distinguished: officially protected housing and social housing. Officially protected housing is characterized by being subsidized by the state, either through low-interest loans to private developers or by the provision of cheap or free land by municipalities (Alberdi, 2014). As for social housing, it is closer to European models but is considered residual in Spain (Arends, 2012), given the low percentage it represents in the total housing stock is virtually nonexistent, partly due to the policies of the Francoist regime, which prioritized property ownership over social rental housing (Alberdi, 2014).

In the Basque Country, the Basque Government's housing policy was consolidated in the 1990s with the goal of meeting the growing housing demand and facilitating access to housing for the population. This policy has been relatively successful, with a significant impact on the housing market and the guarantee of the right to decent housing. The 2006 Land and Urban Planning Law established three types of public housing: special-regime public housing or social housing, general-regime subsidized housing and fixed price housing. These categories target populations with varying income levels, and the purchase or rental prices differ accordingly. Social housing or housing under specific regimes are intended for lower-income social sectors and thus have sale or rental prices lower than those established for the general regime. Conversely, fixed priced housing, although also subsidized, targets individuals with somewhat higher income levels, resulting in higher purchase or rental prices. The law also introduced the concept of dotational accommodations, which, although classified as non-residential but dotational use, aim to provide temporary housing solutions for specific population groups with particular needs, such as young people, divorcees, or women who are victims of gender-based violence. There is also a specific type of housing for the elderly: sheltered housing, with reduced prices and additional services such as concierge, laundry, nursing, etc., which aims to offer the elderly an autonomous life.

The most common type of housing is subsidized housing under the general regime, which can be either for purchase or rental. Social housing is mainly oriented towards renting. Figure 5 depicts the distribution of subsidized housing under the general regime and special regime (social housing), identified as the two principal modalities of the Basque housing policy. Municipalities with populations exceeding 3,000 are required to construct housing with these characteristics. However, only municipalities with more than 20,000 inhabitants are mandated to allocate land for dotational accommodations, and even then, with significantly lower land-use requirements, further limiting the prevalence of this type of housing.

Figure 5. Distribution of general-regime subsidized housing and special-regime or social housing.



Source: Own elaboration based on Udalmap database.

The production of subsidized housing has exhibited irregular evolution in recent decades, with peak activity observed between 2001-2010, followed by a reduction thereafter (Observatorio Vasco de la Vivienda, 2020). Initially, Basque housing policy prioritized the construction of owner-occupied subsidized housing in response to housing shortages and increased demand due to demographic factors. However, with the 2008 economic crisis and constraints on public spending, there was a shift towards promoting rental housing, prioritizing the needs of the most disadvantaged social groups (Garzo, Gallo & Corral, 2020). With the Housing Law 3/2015, greater emphasis has been placed on promoting protected rental housing, marking a shift in Basque housing policy. Currently, subsidized housing policy in the Basque Country is being reoriented towards renting, both in social housing and in general housing, and the Basque Government has announced that next year it will stop building new homes for rent and that it intends to increase the supply of rental housing. Consequently, almost half of the municipalities have not constructed any subsidized housing in the last 15 years (Figure 5), with over 17 % of municipalities having very low values (between 1 and 4 housing units per thousand inhabitants). Only six municipalities (Ubide, Okondo, Murueta, Artea, Vitoria-Gasteiz, and Muskiz) have constructed more than 20 houses per thousand inhabitants. Following them, municipalities with higher rates of housing construction per inhabitant are primarily located in Donostialdea (Astigarraga, Hernani, Lasarte-Oria, and Andoain) and Greater Bilbao (Arrigorriaga, Barakaldo, Derio, Erandio, Etxebarri, Leioa, and Loui).

For understanding this uneven distribution of subsidized housing, several factors must be considered. First, municipalities that have attracted higher population growth tend to prioritize housing development, as their demographic trends create greater demand. Urban planning policies also have a relevant impact, particularly municipal master plans, which designate land for residential purposes. However, these plans are often rigid instruments with lengthy approval processes, limiting the capacity of municipalities to respond quickly to changing housing needs. Furthermore, municipalities without approved plans or with constrained flexibility in reclassifying land for residential uses are unable to allocate sufficient land for subsidized housing. Geographic and physical constraints also affect construction: many municipalities lack suitable land for urbanization due to their topographical conditions or are already fully developed, leaving no available land for new residential projects. In contrast, municipalities in metropolitan areas, such as Greater Bilbao and Donostialdea, benefit from better infrastructure, transportation links, and economic activity, making them more attractive for housing development, including subsidized units.

Regarding social housing, only 18% of Basque municipalities have this type of housing. These are primarily larger municipalities, as no municipality with fewer than 500 inhabitants, only three municipalities with populations between 500 and 2,000, and barely 21% of those with populations between 2,000 and 10,000 inhabitants have this type of housing.

Social housing, although mandated by law for municipalities with more than 3,000 inhabitants to allocate land for its construction or provide compensation if they fail to do so, has not been sufficiently promoted. Due to the scarcity of social housing, any correlation analysis with other indicators used to measure residential segregation yields very low values that do not allow for conclusive results.

Despite this, a cartographic analysis identifies municipalities such as Alonsotegi, Artzentales, Barakaldo, Basauri, Bilbo, Eibar, Erandio, Pasaia, Portugalete, Santurtzi, Sestao, and Errenteria, which not only exhibit an unfavorable socioeconomic situation but also stand out for the age of their housing stock or the percentage of over-occupied housing. Furthermore, Barakaldo, along with Erandio, has maintained a high average in subsidized housing construction, potentially contributing to patterns of residential segregation by attracting groups with low incomes. Several factors help explain this concentration. First, Territorial Planning Guidelines assess housing needs based on factors like population projections, vacancy rates, housing demand, and urban decompression coefficients, and set limits for municipal housing development. Also, industrial facility decommissioning has created spatial opportunities for residential land reclassification. Furthermore, factors such as housing stock age and dwelling overcrowding rates have likely influenced local government strategies, motivating targeted affordable housing interventions to mitigate socioeconomic residential pressures.

Hernani and Lasarte stand out for their low-income levels despite similar levels of subsidized housing construction, suggesting a connection between increased public housing promotion and heightened segregation. Additionally, municipalities with significant immigrant populations, such as Vitoria-Gasteiz, Loiu, and Salvatierra/Agurain, have shown a notable rate of subsidized housing construction. Among municipalities promoting more social housing, Muskiz, Sestao, and Pasaia stand out, each with more than 14 dwellings per 1,000 inhabitants.

5. Discussion

Similar to trends observed in Europe (Tammaru et al., 2015), the residential segregation of population groups based on occupation and income level has been influenced by transformations in advanced capitalist societies over the last three decades. These include the transition from industrial to post-industrial economies and the increasing liberalization and globalization of capital and labor flows. The Basque Country is no exception, and the process of deindustrialization following the economic crisis of 1983 has resulted in persistently high levels of residential segregation in the Left Bank neighborhoods, which were once home to the region's iron and steel industries and the working-class population.

From a socioeconomic perspective, the Basque Country exhibits a concentration of municipalities with significant levels of segregation in the Greater Bilbao area (Alonsotegi, Bilbao, Barakaldo, Basauri, Erandio, Santurtzi, and Sestao), forming a notable spatial grouping. These municipalities also exhibit higher poverty rates and a greater percentage of immigrants, which is evident in residential characteristics showing higher unemployment per household. In this regard, our findings align with those presented by Fullaondo et al. (2014), indicating a heightened demand for social rental housing among the immigrant population due to limited access to other forms of subsidized housing, stemming from their disadvantaged economic circumstances. Consequently, this trend may result in an overrepresentation of this demographic in areas where social housing projects targeting lower-income groups are situated.

Regarding segregation based on ethnic status, it is evident that international immigration is primarily concentrated in larger municipalities, although there are also specific municipalities in the primary sector, particularly in the region of Rioja Alavesa. As noted by Achebak et al. (2017), the size of the municipality plays a significant role, with higher concentrations of the immigrant population generally found in larger municipalities. Furthermore, recent studies in Europe (Arbaci, 2008; Iglesias, 2019; Benassi, Iglesias-Pascual, & Salvati, 2020) support the increasing trend towards suburbanization of the population based on immigration status, observed in some municipalities in the metropolitan areas of Bilbao and Donostia/San Sebastián.

The concentration of the immigrant population in deteriorated urban areas has led to the marginalization of some of these areas, a phenomenon that could potentially result in the formation of ethnic ghettos, as suggested by Martori and Hoberg (2004).

In Alava, Vitoria-Gasteiz has absorbed a significant portion of the subsidized housing supply in the Basque Country, primarily due to the availability of a large volume of urban land and the approval of an expansive general urban development plan at the beginning of the 21st century. The city also hosts one of the highest percentages of foreign population, with a notable concentration of immigrants from Latin American countries. Analysis reveals relatively high segregation based on migratory origin in Vitoria-Gasteiz. Additionally, the map illustrating the percentage of recipients of Income Guarantee Income (IGR) reflects similar patterns to the map depicting the percentage of foreign population. This suggests a greater economic vulnerability among the foreign population, a finding supported by previous research (Benassi et al., 2020; Tammaru, Sinitsyna et al., 2021). Several municipalities in the province, primarily located in the Rioja Alavesa region (such as Baños de Ebro, Berantevilla, Lapuebla de Labarca, and Labastida), have a specialization profile in agriculture. This is due to the contracting of foreign laborers for grape harvesting in the wine-growing activity of Rioja Alavesa.

Correlation coefficients were calculated between the two types of subsidized housing considered and the rest of the indicators. However, the results in all cases were very close to zero, providing no statistical evidence of a significant correlation. The relatively low percentages of subsidized housing in relation to the total existing housing stock prevent us from definitively asserting a direct correlation between public housing and higher levels of segregation. Additionally, the release of many subsidized housing units built before 2003, which could not be considered in this study, may also influence this lack of correlation. Moreover, the presence of numerous municipalities, particularly those with small populations, lacking public housing developments complicates obtaining conclusive results. However, cartographic analysis of the indicators, when examining the distribution by standard deviation, does demonstrate a notable correlation between municipalities with high levels of public housing and those with low levels of public housing, indicating potential associations between subsidized housing and residential segregation. Although a formal micro-level analysis was not conducted, the cartographic visualization of subsidized housing developments, combined with field visits to several areas, provides clear evidence of intra-municipal clustering. This spatial concentration aligns with observed patterns of segregation driven by economic factors, highlighting localized disparities within municipalities. Although a formal micro-level analysis was not conducted, the cartographic visualization of subsidized housing developments, combined with field visits to several areas, provides evidence of intra-municipal clustering. This spatial concentration of subsidized housing is particularly notable in specific intra-urban areas of municipalities such as Vitoria-Gasteiz, Andoain, Areatza, Arrigorriaga, Hernani, Erandio, and Salvatierra-Agurain, where it coincides with high levels of segregation driven by economic factors.

The concentration of social housing in specific areas within the territory, with few municipalities actively investing in this type of housing, suggests a trend where municipalities experiencing housing shortages, such as Bilbao or Donostia/San Sebastián, are transferring this responsibility to peripheral municipalities within their metropolitan areas. This phenomenon may result in individuals with fewer resources being compelled to settle in the outskirts of these metropolitan areas. Other Spanish cities have observed similar patterns, wherein the housing production system influences the reorganization of socioeconomic groups, often driven by gentrification processes associated with global trends such as tourism or urban regeneration (Nel-lo & Sabatini, 2022; Ariza de la Cruz & Sorando, 2023).

Bilbao, for example, has experienced significant urban revitalization efforts, resulting in the gentrification of its central areas. Specifically, the renovated area of Abando-Ibarra reflects this intense competition for central spaces, which has led to a lack of development in public housing projects in the area, consequently displacing the most vulnerable population. The provision of public housing is fairly evenly distributed throughout the city (Antolin & Izaola, 2021). This, coupled with limited access to it by immigrant populations (Fullaondo et al., 2014), prevents the formation of ethnic or vulnerable enclaves as a result of public housing policies.

On the other hand, Donostia/San Sebastián grapples with challenges associated with mass tourism, which drives up housing prices and pushes young people towards the city's outskirts. It is evident that global gentrification trends (Smith, 2012) are impacting the Basque context. Combined with the limited availability of public housing in this city, these effects cannot be effectively mitigated leading to the expulsion of young populations to the city's periphery and nearby municipalities.

In this context, it becomes crucial to integrate housing policy into land use planning to enhance its effectiveness. The Territorial Planning Guidelines (DOT), revised in 2019, emphasize social housing policy as integral to achieving a balanced and inclusive territory. This underscores the necessity for collaborative efforts between urban planning and land use planning, overcoming hierarchical structures in planning processes. The advancement of the Territorial Sectorial Housing Plan of the Autonomous Community of the Basque Country (CAPV), though drafted in 2003 and never approved, aimed at aligning with these principles, serving as a reference for territorial housing policy.

One of the challenges is integrating the planning of public housing supply at the territorial level with municipal planning, while recognizing that land classification is the responsibility of municipalities. However, the quantification of housing needs and the allocation of housing quotas among municipalities fall under territorial planning frameworks, such as the Territorial Planning Guidelines or the Partial Territorial Plans. In this context, entities like Etxebide (Basque Housing Service), along with other public agencies such as VISESA (responsible for public housing promotion and urban rehabilitation) and Alokabide (which manages public rental housing), play pivotal roles. Equally important are municipal companies involved in housing policy and the city councils themselves, acting as key agents to intervene in municipal land use, ensuring the provision of subsidized housing without fostering housing concentration and advocating for mixed residential areas.

6. Conclusions

The analysis conducted at the municipal level has provided a preliminary understanding of residential segregation and its relationship with public housing policy. Through the examination of economic, social, and residential indicators, we have identified pockets of social and economic segregation in specific municipalities, especially in post-industrial areas of Greater Bilbao like Barakaldo, Basauri, and Santurtzi. These areas have experienced persistent segregation since the deindustrialization processes of the 1980s, alongside emerging trends of immigrant population concentration and the displacement of vulnerable groups to peripheral areas due to nascent gentrification in the central areas of Bilbao and Donostia/San Sebastián.

While a strong correlation between a greater provision of social housing and worse segregation indicators was not found at the municipal level, there are geographic correlations between these phenomena in several contexts. However, limitations exist, including the focus on the micro scale –district, neighborhood, or census tract level–, which hinders the examination of intra-urban segregation within cities and population centers. Future research could address this limitation by combining micro-level analysis with intra-municipal examination of segregation in densely populated cities.

Future research could build upon the findings of this study by incorporating more advanced analytical techniques. For instance, the superimposition of thematic maps could help identify areas with overlapping socio-economic challenges, while a cluster analysis using the existing data could reveal patterns of similarity among municipalities. Additionally, a regression model could be developed to explore the relationships between key variables and deepen our understanding of the factors influencing socio-economic disparities. These approaches would require a new methodological design, but they represent promising directions for future studies to complement and expand the insights provided in this article. Additionally, future research should aim to diagnose urban vulnerability at the census tract or neighborhood level to identify priority areas for intervention within urban centers.

Furthermore, the scarcity of social housing in many municipalities, especially smaller ones, presents challenges in addressing their interrelationship with segregation and understanding the complex causes and effects associated with it. Future studies could explore evolutionary analyses of segregation patterns to identify trends and processes driving segregation over time. Utilizing complete time series for all indicators and integrated approaches that analyze residential flows and changes between municipalities would enhance the richness of future studies. Combining quantitative analysis with qualitative methodologies could also provide deeper insights into the phenomenon of segregation, offering a more comprehensive understanding of its underlying dynamics and implications.

In conclusion, the integration of housing policy into land use planning, from a social perspective rather than solely an urban planning one, holds promise for reducing social and residential segregation in the Basque Country. It is crucial to recognize that the lack of subsidized housing supply in smaller municipalities exacerbates challenges such as demographic aging and hampers young people from establishing residence there. Addressing this scenario requires housing policy to be integrated into territorial planning, aiming to increase the resilience of the territory and its population while promoting equal opportunities and social welfare across municipalities. This integration depends not only on strategic planning but also on political will and adequate financial resources. Territorial policy should tailor the promotion of public housing according to the levels of vulnerability and segregation identified in each municipality, thus preventing excessive concentrations. Sectoral planning will facilitate the integration of planning scales and effective transversality, enabling the appropriate extension of land for public housing development. It is imperative to adapt approaches to local dynamics and optimize synergies between planning scales. Moreover, policy-makers should carefully evaluate considerations such as quantity, building typology, construction characteristics, and especially the location of public housing developments, to mitigate residential segregation effectively. By taking these steps, policymakers can work towards creating more inclusive and equitable communities throughout the region.

Acknowledgements

We would like to express our sincere gratitude to the editor and the two anonymous reviewers for their valuable suggestions and insightful recommendations. Their feedback has greatly contributed to improving the quality of this paper and enriching the final work. We deeply appreciate their time, effort, and expertise in reviewing the manuscript. We also gratefully acknowledge the financial support of the Basque Government (GPAC-Research Group on Built Heritage; Grant: IT1617-22), the Government of Spain, and the European Regional Development Fund (Grant PID2021-123686OB-I00 and Grant PID2023-146662OB-I00 funded by MCIN/AEI/10.13039/501100011033 and ERDF A way of making Europe).

Authorship

First author: conceptualization, content curation, methodology, formal analysis, research, resources, visualization, validation, original drafting-drafting. Second author: conceptualization, formal analysis, fund acquisition, research, project management, supervision, visualization, writing-revision and editing.

Conflict of interests: The authors declare no conflict of interest.

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