



Challenges and strategies in the application of municipal regulations for social housing in Guayaquil

Desafíos y estrategias de la aplicación de las normativas municipales para las viviendas de interés social de Guayaquil

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Abstract

The article analyzes the challenges of complying with municipal regulations and their contribution to the design of social housing that promotes access to community housing in the city of Guayaquil, Ecuador, with an emphasis on cadastral updating (building regularization). It examines the effectiveness of regularizations as an urban planning tool, identifying institutional limitations such as staff shortages, procedural delays, excessive documentation requirements, and multiple corrections. Through critical analysis, strategies and mechanisms are proposed to optimize these processes, contributing to more efficient and equitable land use planning in Ecuador's main port city. The study adopted a case study design, focusing on the city of Guayaquil, which allowed for an in-depth analysis of the institutional and territorial context. Content analysis techniques were applied for document review, descriptive statistics for quantitative data processing, and thematic analysis for qualitative information. The triangulation

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of sources and methods ensured the validity of the results and strengthened the consistency of the conclusions obtained. In conclusion, the disparity between the formal and informal sectors continues to widen, highlighting the urgent need for more flexible policies within the municipal regulatory framework to include developments that promote the adoption of a type of community housing that addresses the lack of access to decent housing in Guayaquil.

Keywords: Urban planning, municipal regulations, social housing, regularization

Resumen

El artículo analiza los desafíos del cumplimiento de las normas municipales y su aporte al diseño de viviendas de interés social que promuevan el acceso de la vivienda comunitaria en la ciudad de Guayaquil, Ecuador, con énfasis en la actualización catastral (regularización de edificaciones). Se examina la efectividad de las regularizaciones como herramienta de planificación urbana, identificando limitaciones institucionales como la falta de personal, demoras procesales, excesiva documentación requerida y múltiples correcciones. Mediante un análisis crítico, se proponen estrategias y mecanismos para optimizar estos procesos, contribuyendo a un ordenamiento territorial más eficiente y equitativo en la principal ciudad portuaria del Ecuador. El estudio adoptó un diseño de caso de estudio, centrado en la ciudad de Guayaquil, que permitió un análisis profundo del contexto institucional y territorial. Se aplicaron técnicas de análisis de contenido para la revisión documental, estadística descriptiva para el procesamiento de datos cuantitativos y análisis temático para la información cualitativa. La triangulación de fuentes y métodos

garantizó la validez de los resultados y fortaleció la consistencia de las conclusiones obtenidas. En conclusión, la disparidad entre lo formal y lo informal sigue propagándose, evidenciando la imperiosa necesidad de políticas más flexibles dentro del marco normativo municipal para la inclusión de desarrollos que promuevan la adopción de una tipología de vivienda comunitaria que abastezca el déficit de acceso a una vivienda digna en Guayaquil.

Palabras clave: Planificación urbana, normativa municipal, viviendas de interés social, regularizaciones

Introduction

In recent decades, the city of Guayaquil has experienced rapid urban growth; according to the 2022 census, it has a population of 2,772,896 (INEC, 2022). This has led to the construction of new infrastructure, the reconfiguration of public spaces, and changes in land use, posing significant challenges in terms of land use planning. Rapid urban growth and internal migration have led to the proliferation of housing in informal settlements that require cadastral updating (regularization of buildings) for their integration into the formal urban fabric.

In many low-income and peripheral sectors of Latin American cities, the implementation of municipal regulations is restricted and complicated, as it becomes exclusive and does not allow for the inclusion of more flexible proposals that promote true social and economic inclusion within housing modalities. This is mainly the result of high levels of informality in land occupation, unauthorized construction, and the absence of effective control and supervision by local authorities (Galarza & García, 2020; González & Ruiz, 2019).

However, although there are urban planning regulations that seek to support safety and order in buildings, most are not enforced due to a lack of technical resources, slow legalization processes, and a lack of technical support for communities (Municipality of Guayaquil, 2022; Expreso, 2022).

As a result, most homes are poorly designed and built with materials that fall below quality standards, posing a latent risk to low-income families (García & Martínez, 2021). In addition, institutional fragmentation and excessive enforcement of rules further complicate urban standardization and progress (González & Ruiz, 2019).

The implementation of the “Special Ordinance for the Cadastral Update of Completed Buildings that do not have a final inspection and/or cadastral registration and with land use different from that recorded in the Cadastral System” in the city of Santiago de Guayaquil represents a significant effort by municipal authorities to improve the accuracy and efficiency of real estate registration, which has a direct impact on tax collection, urban planning, and the provision of public services. However, it is crucial to assess whether this regulation has been effectively applied in all sectors of the city, considering the particularities of each one, from the central areas to the most peripheral ones, which may have different socioeconomic and urban dynamics.

Studying the effectiveness of the regulations is important because an accurate and well-managed cadastral update is essential for the proper distribution of resources and services. The cadastral update is linked to the city's ability to generate tax revenue, and its outdated nature affects the quality of life of citizens, as resources for works and services are limited. If tax collection does not reflect the reality of each sector, this could limit the implementation of infrastructure and service projects, mainly affecting the most vulnerable areas; therefore, an updated cadastre is essential for efficient urban planning.

An accurate and up-to-date cadastral system provides the basis for decision-making on land use, zoning, urban expansion, and the distribution of public services. A realistic urban cadastre will allow for increased revenues in favor of city planning and a better redistribution of these revenues for the benefit of spatially segregated sectors.

Cadastrals are instruments that exist in different municipal administrations, but they generally need to be updated or restructured, as the passage of time has rendered them obsolete. This is a reality that characterizes a large part of the cadastrals in Latin America. The updating of cadastrals must take into account the cost-benefit of this operation, as very complex cadastrals involve higher costs. In addition, a simple cadastre that gathers the necessary data for urban planning is more useful in terms of saving financial resources, time, and effort. It is essential to preserve data quality by making rational use of available technology.

The decision to update the cadastre stems from the need to increase property tax revenue; it is important to be clear about which variables will be updated, and when and how this will be done. The updating of a cadastre should be a consequence of changes in the urban reality, such as: expansion of the city, emergence of speculation bubbles in certain neighborhoods, increase in the volume of property transfers, proliferation of irregular settlements, among other unforeseeable factors.

A strategy for the continuous updating of the cadastre is known as cadastral maintenance, which aims to ensure that cadastral data is as close as possible to reality; this implies that such maintenance must also include massive updates (of the entire city or of certain sectors) in short periods. (Águila, M & Erba, D, 2007)

This legible scheme will allow the city of Guayaquil to generate a true ordering of buildings in favor of sustainable urban

planning and the inclusion of social housing proposals. The present study aims to analyze the challenges and strategies that should be implemented for the comprehensive inclusion of social housing within public policies so that it can be considered a typology within Guayaquil's urban planning.

Methodology

Land use planning is defined as the process of organizing land use and occupation, aimed at achieving balanced and sustainable development. According to Massiris (2005), it involves regulating and promoting the location and development of human settlements, economic activities, facilities, and infrastructure, taking into account environmental conditions, social aspirations, and development possibilities.

In the Latin American context, land use planning has evolved from technocratic approaches to more participatory and comprehensive perspectives. Fernández (2010) points out that urban planning must consider not only physical aspects, but also social, economic, and environmental dimensions in order to achieve more inclusive and sustainable cities.

The housing crisis in Ecuador, especially in informal urban areas, has reached critical levels that affect access to decent housing for a significant percentage of the population. According to data from the National Institute of Statistics and Census (INEC, 2020), 39% of Ecuadorian households lack adequate housing and live in overcrowded conditions.

Land use and urban planning in the context of Guayaquil for growth management, especially in the process of regularizing informal settlements and the sustainable development of the city. Urban planning must consider the integration of these settlements, ensuring access to basic services and public spaces, as well as security and social cohesion.

2.2 Cadastral updating and municipal regulations for housing management in Guayaquil

Cadastral updating (regularization) is understood as the set of actions aimed at formalizing existing informal constructions, providing them with legal security, basic services, and adequate housing conditions. Fernandes (2011) distinguishes between legal cadastral updating (titling) and urban cadastral updating (adaptation to urban regulations). Approaches to cadastral updating (regularization) have evolved from eradication programs to in situ improvement strategies. According to UN-Habitat (2003), successful regularizations must combine legal, urban, and social aspects, ensuring community participation and long-term sustainability.

The specialized literature identifies multiple challenges in the implementation of cadastral updating (regularization) processes. Smolka (2003) highlights bureaucratic complexity, lack of inter-institutional coordination, and limited technical capacity as the main obstacles.

An analysis of municipal policies within the Municipality of Guayaquil reveals that there are no official annual and comparable data published publicly that directly indicate the number of dwellings that comply with municipal building regulations in Guayaquil. However, data is available from the most important update from 2008 to 2025. No explicit record has been published on the number of homes that “comply” vs. “do not comply” with building standards year by year during that period.

What is available is data indirectly related to construction, regularization, and building permits—which are useful approximations, but not equivalent to strict regulatory compliance. Below is a table with approximate data based on available statistics on regularization applications and homes

built/permits, along with notes explaining the limitations of this data:

The study adopted a case study design, focusing on the city of Guayaquil, which allowed for an in-depth analysis of the institutional and territorial context. Content analysis techniques were applied for document review, descriptive statistics for quantitative data processing, and thematic analysis for qualitative information. The triangulation of sources and methods ensured the validity of the results and strengthened the consistency of the conclusions obtained.

The methodological analysis is based on criteria and aspects of public policy within the cadastral update of regularizations and their correlation with the main regulations of the Municipality of Guayaquil that affect or regulate aspects related to social housing:

Substitute Ordinance on Land Subdivision and Urban Development

This is the main municipal ordinance regulating land subdivision and urban development in the canton of Guayaquil, including social housing projects and similar projects (serviced lots).

Its reforms and provisions establish requirements and procedures for the approval and development of urban developments that may include social housing.

The regulations define obligations and conditions for social housing or similar residential developments, which must comply with the provisions of this ordinance and other national land use regulations.

Amendments to the Replacement Ordinance (August 2023)

First amendment to the Replacement Ordinance on Land Parceling and Urban Development, published in Municipal Gazette No. 5 (2023), which updates criteria for public or private

urban development projects, including the requirement for a prior technical report and municipal approval for social housing projects.

Tax Incentive Ordinance for Social Interest Housing Programs

Municipal ordinance establishing tax benefits (e.g., municipal tax reductions) to encourage investment in social interest housing programs in the canton of Guayaquil, seeking to promote the construction of this type of housing.

General Ordinance on Buildings and Construction in the Canton of Guayaquil

Although it is a general building regulation, it contains specific sections and annexes that regulate the construction of affordable housing developments and social housing programs, such as land use types, densities, and associated technical requirements.

Urban Planning and Land Use Regulations

Complementary regulations on land use and occupation in Guayaquil—included in municipal plans and the Local Information System—condition where and how residential projects, including social housing, can be developed.

These policies are also integrated into municipal regulatory plans and annexes to urban planning ordinances.

Results

Successful or approved regularizations have provided legal certainty to families in Guayaquil who have voluntarily agreed to comply with regulations, allowing access to basic services such as drinking water, sewerage, and electricity in areas poorly served by the local council.

One example is sectors such as Flor de Bastión and Monte Sinaí, where cadastral updating (regularization) has facilitated investments in infrastructure that significantly improve citizens' quality of life. In addition, it will allow thousands of property owners to regularize their property status, accessing the cadastral registry without the need for demolitions or costly penalties.

Cadastral updating (regularization) processes will contribute to the integration of certain informal settlements into the general urban fabric, improving connectivity and access to urban facilities necessary for the development of their basic activities. The opening of roads and the implementation of public transportation systems have reduced the isolation of these communities.

Formal recognition of property improves its commercial value and allows for its incorporation into planned urban development. Legalization also drives the progressive improvement of the physical environment and housing, which allows for a revaluation of urban heritage.

Formalization has stimulated the local economy by increasing property values as buildings are incorporated into the tax system. Local studies indicate increases of 40-60% in property values. Regularized buildings will begin to be taxed fairly, which represents an increase in the municipality's tax base and contributes to greater fiscal equity and financing for public works. In addition, there is recognition of neighborhood economic activities, as the most recent reforms included the possibility of regularizing small family businesses (stores, bakeries, hairdressers, workshops), especially in low-income areas, which facilitates local economic development without resorting to closures or arbitrary sanctions.

With updated deeds and cadastral registration, many owners were able to access bank loans and formalize sales transactions,

which activates the real estate market in previously informal sectors.

The shortcomings of the reforms to the Special Ordinance for the Cadastral Update of Completed Buildings that do not have a Final Inspection and/or Cadastral Registration, and that also have a land use different from that recorded in the Cadastral System in Guayaquil, according to the assessment of the documentation investigated, can be classified as legal, technical, administrative, and social. The following problems have been identified:

Lack of clarity in scope: it is not always clear which buildings or activities are actually covered by the ordinance, which creates legal uncertainty.

Regulatory uncertainty: constant reforms (five in total since 2020) create confusion among citizens, technicians, and officials.

Overlap with other regulations: it may conflict with the Land Use and Management Plan (PUGS) or environmental and land use regulations.

Limitations due to incomplete cadastral updating: the cadastre continues to have deficiencies in peripheral or urban expansion areas, limiting the effectiveness of the ordinance.

Incompatible informal land use: in many cases, it allows for the legalization of buildings with land uses not permitted by the PUGS, creating a technical contradiction with land use planning.

Lack of structural verification: it does not require in-depth technical inspections, which jeopardizes the safety of buildings regularized solely through documentary procedures.

Persistent bureaucracy: although the latest reform (June 2025) seeks to simplify procedures, there are still cumbersome processes such as plans, permits, deeds, or land use validation

that are difficult for vulnerable sectors. In extreme cases, the processes require between 10 and 15 different documents, including topographic, environmental, risk, and service feasibility studies. This documentation, with costs ranging from \$2,000 to \$5,000, represents a significant barrier for low-income communities. The average time to complete a cadastral update (regularization) process ranges from approximately 9 to 12 months, sometimes exceeding 15 months, significantly exceeding the deadlines established by regulations.

Delays are concentrated in the phases of inspector assignment (25%), technical evaluation (45% of the time), and final approval (30% of the time). The need for approvals from multiple entities (municipality, service companies, environmental entities) leads to duplication of procedures and lack of coordination. Forty percent of delays are attributed to this institutional fragmentation.

Limited capacity of the municipality: there is not enough staff or technology to quickly process the thousands of applications generated by the ordinance. The analysis revealed that the municipality has only 32 specialized technicians to handle cadastral updating (regularization) processes, resulting in a ratio of approximately 20 applications handled daily by each technician (data obtained through a random survey of DUMCE staff). This work overload causes significant delays in the evaluation and approval of the procedures submitted.

Lack of follow-up and oversight: once the Regularization Certificate has been issued, there is no robust system for subsequent control. According to data obtained from the control records of the regularizations assigned to the CAE Guayas, 26% of regularization requests require corrections, and in 18% of cases, the processes must be re-submitted, unnecessarily prolonging the time it takes to resolve them. The most frequent observations include: lack of supporting documentation (18%), non-compliance with technical

specifications (14%), and inconsistencies in limited schemes or parameters (8%).

Unequal access: the benefits of the ordinance do not easily reach those living in low-income or marginalized areas due to technological, economic, or educational barriers.

Lack of socialization: many citizens are unaware of the ordinance or do not understand how to apply it, which limits its impact.

Possible incentive for irregular construction: by opening up the possibility of regularizing illegal buildings, it may be rewarding informality and discouraging regulatory compliance from the outset.

A practical example could be a bakery built without a license in a residential area, which could benefit from the ordinance and regularize its commercial land use. However:

This may violate the PUGS if the area is zoned exclusively for housing.

It may cause nuisance to neighbors (noise, traffic).

It does not guarantee that the construction complies with structural or health safety standards.

Although the ordinance has a laudable objective—to formalize and update Guayaquil's urban cadastre—its legal, technical, and social shortcomings limit its effectiveness. Harmonization with the PUGS, better enforcement, and more transparent and equitable processes are needed to prevent the regulation from becoming an open door to informality or an inefficient instrument.

The text sets out a comprehensive set of strategies aimed at improving urban regularization, control, and management processes through institutional strengthening, administrative modernization, inter-institutional coordination, community

participation, and adaptation of the regulatory framework. These actions seek to respond structurally to the technical, bureaucratic, and legal constraints that have historically hindered the formalization of buildings and efficient land management.

First, institutional strengthening is proposed as a fundamental axis for ensuring the quality and speed of processes. It is recognized that the shortage of specialized technical personnel is one of the main bottlenecks in the review, oversight, and approval of procedures. Therefore, it is proposed to increase the number of professionals with specific training, which would allow for the adequate distribution of the workload, reduce response times, and improve the technical rigor of evaluations. This strengthening is not limited to a quantitative increase in staff, but emphasizes the need to form multidisciplinary teams composed of architects, engineers, and lawyers capable of comprehensively addressing the technical, legal, and urban planning dimensions of each case.

Complementarily, the importance of implementing ongoing training programs aimed at both professionals involved in administrative processes and the general public is underscored. Ongoing training would make it possible to update regulatory knowledge, standardize technical criteria, and reduce recurring errors in the submission of applications. Likewise, citizen training would contribute to a greater understanding of the requirements and responsibilities associated with regularization, promoting a more collaborative relationship between the public administration and users. In this context, there is a clear need to unify the criteria used by inspectors through permanent technical instructions that ensure consistency in the interpretation of regulations and avoid contradictory decisions between different evaluators.

The second strategic axis focuses on the simplification and modernization of administrative processes, with a special

emphasis on comprehensive digitization. The implementation of digital platforms is proposed to enable the efficient management of corrections, reducing dependence on in-person procedures and physical documentation. The mandatory use of electronic signatures by the professional responsible for the procedure is proposed as a key tool to ensure the traceability, authenticity, and technical responsibility of the files, in addition to streamlining approval flows.

Reducing the documentation required is another essential component of modernization. It is suggested that redundant or unnecessary documents that do not add real technical value to the process be eliminated, and that sworn statements be accepted in place of more complex legal procedures, such as effective possession, especially in contexts where these requirements represent a significant barrier to regularization. Additionally, the creation of reusable technical information banks is proposed, which would allow for the systematization of recurring criteria and exceptions, facilitating the evaluation of similar cases and reducing administrative discretion.

The standardization of technical criteria appears to be a cross-cutting element for improving the transparency and predictability of processes. The development of standardized checklists would allow applicants to clearly understand the requirements from the outset, minimizing subsequent observations. Likewise, the implementation of automatic pre-evaluation systems would help detect early inconsistencies in files, optimizing technical review time. These mechanisms are complemented by the establishment of clear and explicit approval criteria, which strengthens legal certainty and reduces uncertainty for both professionals and citizens.

The third axis addresses inter-institutional coordination, recognizing that urban regularization involves multiple public and private actors. The creation of a permanent inter-institutional technical committee, made up of all relevant

entities, is proposed in order to coordinate actions, share information, and jointly resolve problems that arise in the approval processes. This committee would allow for the establishment of clear coordination protocols, the definition of maximum response times, and the promotion of the use of information-sharing systems that avoid duplication and unnecessary delays. Likewise, the possibility of developing simultaneous approval procedures is proposed, reducing the time associated with sequential procedures between different institutions.

In this same vein, the importance of formalizing collaboration agreements with public service companies is highlighted, given their key role in the provision of basic infrastructure and the validation of technical conditions. These agreements would make it possible to establish prioritization protocols for areas subject to regularization and cadastral updating processes, as well as to develop joint financing mechanisms that facilitate the implementation of necessary interventions. In addition, it is proposed to promote inter-institutional training programs that strengthen common technical capacities and foster a shared vision of urban management.

The fourth strategic axis focuses on community participation and technical assistance, recognizing that regularization cannot depend exclusively on the individual capacity of property owners. The creation of a free technical assistance program is proposed, coordinated with professional associations of architects and engineers, to provide specialized support to communities with fewer resources. This program is complemented by the development of educational guides that explain procedures and requirements in a simple manner, facilitating understanding and regulatory compliance. It also proposes the creation of decentralized service offices, bringing technical services closer to the territories and reducing barriers to access.

Finally, the text addresses the regulatory and legal framework as an essential component for making the proposed strategies viable. It highlights the need to update and harmonize local regulations with national laws, avoiding contradictions and legal loopholes that hinder regularization. The simplification of legal procedures is proposed as a key measure to reduce costs and time, especially in contexts of consolidated informality. It also proposes the creation of specific legal figures to deal with special cases, such as inheritances or irregular sales, which currently represent significant obstacles.

As a complement, incentives for formalization are proposed, such as temporary property tax exemptions and mechanisms to facilitate regularization in municipalities within urban limits. These measures seek to generate real incentives for owners to initiate cadastral updating processes, understanding formalization not only as a legal obligation but also as an opportunity to improve legal security, access to services, and sustainable urban planning.

Conclusions

The processes of updating municipal regulations are not focused on or address specific issues related to improving the quality of social housing or implementing it as a type of housing design that is fully approved in the city of Guayaquil. They present a complex picture that combines significant achievements with important limitations that affect their effectiveness as a land use planning tool.

Regularizations have proven to be fundamental in improving the living conditions of thousands of families in Guayaquil, providing legal security, access to basic services, and opportunities for economic development. Successful cases demonstrate the potential of these processes to transform informal settlements into neighborhoods integrated into the formal urban fabric.

The limitations of the current system are structural and require comprehensive interventions. Insufficient technical staff, procedural delays, excessive documentation requirements, and a lack of inter-institutional coordination create a scenario that significantly limits the effectiveness of regularizations as a land use planning tool.

The results suggest the need to move from a reactive approach to a preventive and proactive one in order to establish designs and improvements within a community housing framework. This implies not only improving existing processes, but also developing mechanisms to prevent the formation of new informal settlements.

The proposed strategies are technically viable and financially feasible, considering the municipal budget and the possibilities for inter-institutional cooperation in the implementation of public policies that contribute to the concrete development of resources and pre-established design typologies to improve access to housing and reduce the gap in the face of a housing deficit that already exceeds 40%.

It is recommended to conduct further studies on the social and economic impact of regularizations, comparative analyses with other Latin American cities, and assessments of the environmental sustainability of these processes. It is also necessary to investigate innovative mechanisms for financing and community participation.

In conclusion, regularizations are a necessary but insufficient tool for land use planning in Guayaquil. Their optimization, through the implementation of the proposed strategies, is essential for building a more orderly, equitable, and sustainable city.

Reference

- Avila Beneras, J., Fois Lugo, M., & Hechavarría Hernández, J. R. (2020). Strategies for accessibility to the teodoro maldonado hospital in guayaquil. a design proposal focused on the human being. *Advances in Intelligent Systems and Computing*, 1131, 1256–1262. https://doi.org/10.1007/978-3-030-39512-4_192
- Carrión, A. y Erazo, J. (2012). La forma urbana de Quito: una historia de centros y periferias. *Bulletin de l'Institut français d'études andines*, 41(3), 503-522.
- de Murzi, T. P., & Orejuela, G. (2022). Residential tissues in Guayaquil: urban indicators relating to compactness and functionality[Tejidos residenciales en Guayaquil: indicadores urbanos relativos a la compacidad y la funcionalidad]. *ZARCH*, 19, 124–139. https://doi.org/10.26754/OJS_ZARCH/ZARCH.2022196923
- De Murzi, T. P., & Orejuela, G. (2023). The geography of Urban fragmentation: Gated communities in the Urban expansion of Guayaquil, Ecuador[Geografía de la fragmentación urbana: las urbanizaciones cerradas en la expansión de Guayaquil, Ecuador]. *Revista de Urbanismo*, 48, 110–134. <https://doi.org/10.5354/0717-5051.2023.67778>
- Fernandes, E. (2011). Regularization of informal settlements in Latin America. Policy Focus Report. Lincoln Institute of Land Policy.
- Fernández, R. (2010). Planificación urbana en América Latina: experiencias de gestión territorial. Editorial Universidad Nacional.
- Hidalgo Silva, D. (2025). Guayaquil: Management Model and Implementation of the Market City. In *Urban Book Series: Vol. Part F1152* (pp. 247–263). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-031-94235-8_10
- Instituto Nacional de Estadística y Censos - INEC. (2022). Censo de Población y Vivienda 2022. Quito: INEC.

- Lopez, A. P., Vazquez, M. L., & Hernández, J. R. H. (2021). Pedestrian traffic planning with topos: Case study urdesa norte, guayaquil, ecuador. *Advances in Intelligent Systems and Computing*, 1253, 69–76. https://doi.org/10.1007/978-3-030-55307-4_11
- Massiris, Á. (2005). *Fundamentos conceptuales y metodológicos del ordenamiento territorial*. Tunja: Universidad Pedagógica y Tecnológica de Colombia.
- Méndez-Vélez, F., Palomeque-Cantos, R., & Borja-Pozo, C. (2022). Socio-economic evolution of Ecuador: Main economic indicators and social phenomena in recent years. *AIP Conference Proceedings*, 2574, 090006. <https://doi.org/10.1063/5.0105186>
- Municipio de Guayaquil. (2023). *Plan de Desarrollo y Ordenamiento Territorial 2021-2031*. Guayaquil: Dirección de Planificación.
- Municipio de Guayaquil. (2024). *Informe de Gestión de Regularizaciones 2015-2024*. Guayaquil: Dirección de Planificación Territorial.
- Rico, M. S. O., Vergara-Romero, A., Subia, J. F. R., & del Río, J. A. J. (2022). Study of citizen satisfaction and loyalty in the urban area of Guayaquil: Perspective of the quality of public services applying structural equations. *PLoS ONE*, 17(2), e0263331. <https://doi.org/10.1371/journal.pone.0263331>
- Sánchez Padilla, M. L., Hechavarría Hernández, J. R., & Portilla Castell, Y. (2021). Systemic Analysis of the Territorial and Urban Planning of Guayaquil. *Lecture Notes in Networks and Systems*, 271, 411–417. https://doi.org/10.1007/978-3-030-80624-8_51
- Smolka, M. (2003). Informalidad, pobreza urbana y precios de la tierra. *Land Lines*, 15(1), 1-4.
- Torres-Espinoza, J., & Delgado-Bohórquez, A. (2023). Sustainability evaluation and densification proposals in the center of Guayaquil city[Evaluación de sostenibilidad y propuestas de densificación en el centro de la ciudad de

- Guayaquil]. Estoa, 12(24), 92–108.
<https://doi.org/10.18537/est.v012.n024.a08>
- Vallejo-Robalino, D., Ríos-Rivera, I., & Plaza, G. G. (2024). Social Cartographies in Contexts of Violence(s): (Re)mapping Borders and Limits in the Peripheral Barrios of Guayaquil, Ecuador[Cartografias sociais em contextos de violência(s): (des)desenhar fronteiras e limites nos bairros populares de Guayaquil, Equador][Cartografías sociales en contextos de violencia(s): (des)dibujar fronteras y límites en los barrios populares de Guayaquil, Ecuador]. *Revista de Estudios Sociales*, 2024(88), 39–57.
<https://doi.org/10.7440/res88.2024.03>
- UN-Habitat. (2003). *The Challenge of Slums: Global Report on Human Settlements 2003*. London: Earthscan.
- UN-Habitat. (2020). *World Cities Report 2020: The Value of Sustainable Urbanization*. Nairobi: UN- Habitat.
- Universidad Casa Grande. (2023). *Análisis de asentamientos informales en Guayaquil: diagnóstico y propuestas*. Guayaquil: Observatorio Urbano.
- Zambrano, M. (2022). "Actualización catastral (regularización) urbana en Ecuador: balance y perspectivas". *Revista Latinoamericana de Estudios Urbanos*, 8(2), 45-62.
- Zambrano-Monserrate, M. A., Ruano, M. A., Silva, C. A., Campoverde, R., Rosero, C., & Sanchez-Loor, D. A. (2023). Dynamism of the housing rental market in Guayaquil, Ecuador: an empirical analysis. *Empirical Economics*, 64(2), 747–764. <https://doi.org/10.1007/s00181-022-02271-z>