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Governance assessment in post-earthquake urban regeneration: historic and commercial center of Portoviejo

Gobernanza en la reconstrucción post-terremoto: centro histórico y comercial de Portoviejo

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ABSTRACT The main objective of this article is to evaluate the quality of territorial governance in the post-earthquake recovery of Portoviejo following the April 16, 2016 earthquake analyzes the articulation between the public and private sectors, as well as citizen participation in all urban regeneration programs, with the purpose of identifying the main urban changes in the sector. For this purpose, an exhaustive documentary review was carried out, and information was collected in situ, including the elaboration of thematic maps and focus groups. It is concluded that, despite addressing social, economic and environmental aspects, urban regeneration in Portoviejo is still exposed to vulnerabilities and threats. Problems in urban structure, infrastructure and governance are highlighted, suggesting comprehensive regeneration to improve the quality of life and promote sustainable development.

RESUMEN El objetivo principal de este artículo es evaluar la calidad de la gobernanza territorial en la recuperación post-terremoto del 16 de abril de 2016 en la ciudad de Portoviejo. Se analiza la articulación entre los sectores público y privado, así como la participación ciudadana en todos los programas de regeneración urbana, con el propósito de identificar los principales cambios urbanísticos del sector. Para este fin, se realizó una exhaustiva revisión documental y se recopiló información in situ, lo que incluyó la elaboración de mapas temáticos y la realización de grupos focales. Se concluye que, a pesar de abordar aspectos sociales, económicos y ambientales, la regeneración urbana en Portoviejo sigue expuesta a vulnerabilidades y amenazas. Se destacan problemas en la estructura urbana, infraestructura y gobernanza, sugiriendo una regeneración integral para mejorar la calidad de vida y promover el desarrollo sostenible.

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KEYWORDS governance, resilience, sustainable reconstruction, urban regeneration, urban structure

PALABRAS CLAVE gobernanza, resiliencia, reconstrucción sustentable, regeneración urbana, estructura urbana

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1. Introduction

The term "governance" gained popularity in 1989 with a World Bank report on Sub-Saharan Africa, highlighting governments' inability to govern effectively. In 1993, Jan Kooiman's book *Modern Governance: New Government – Society Interactions* formalized the concept in the academic sphere, emphasizing new relationships between government and society in response to 20th-century changes (Aguilar, 2010).

Governance has evolved from referring solely to government action to encompassing different conceptualizations. Some authors define it as the creation of rules that enable stable consensus and ensure transparency, while others see it as the articulation of regulations within a territory, re-examining the relationships between civil society, the state, and the market (Mayorga and Córdova, 2007).

Good governance and a renewed approach to politics emphasize that development involves the interaction between the state, the market, and civil society, including NGOs, cooperatives, and trade unions. In this context, citizen participation is essential for effective governance (Mayorga and Córdova, 2007), which means that citizens influence the formulation, implementation, and control of projects, programs, and public policies related to their habitat that affect their lives and the established order (Castillo-Cubillos, 2017). Social production of the habitat through participatory processes strengthens community practices, promotes direct democracy, and improves social coexistence, focusing on the human being to drive innovative changes in the territories (López, 2010).

In this context, Latin American cities have historically faced considerable challenges due to various threats, revealing the urgent need for effective governance and comprehensive planning to mitigate their impacts. This article focuses on the persistent problem of inadequate governance in the face of risk situations, with particular emphasis on the case of Portoviejo, Ecuador, a city hit by the devastating earthquake of 16th April 2016, an event that triggered a series of phenomena that worsened existing socio-territorial problems, challenging the capacity of local authorities to respond effectively and promote sustainable recovery.

The deficiencies in risk management, from the lack of disaster preparedness to the disconnection between the government and local communities, have exacerbated the vulnerability of Latin American cities (Valdivieso, 2019). In Portoviejo, despite reconstruction efforts reflected in various governmental plans and projects, historical and social factors have been neglected, and issues such as the depopulation of the historic and commercial centre have contributed to the decline in territorial development (Medina, 2021). This article highlights the need for stronger governance and planning that prioritizes citizens' safety and well-being, adopting integrated approaches that involve the community and experts to promote resilient and sustainable urban development in the face of natural threats.

In this context, Portoviejo serves as a case study to analyse democratic governance and sustainable development, which are fundamental for equitable growth in developing cities (World Bank, 2023), and essential to ensure a just and fair society (United Nations, 2023). This study evaluates the quality of governance in the post-earthquake urban regeneration of Portoviejo's Historic and Commercial Centre, considering its current urban structure, the legal instruments implemented, and the citizens' perspective on territorial issues, to promote sustainable and resilient urban development. It aims to become a reference for future projects in other disaster-affected areas.

Urban and territorial planning is central to the renewed paradigm of urban governance, promoting local democracy, participation, inclusion, transparency, and accountability to ensure sustainable and high-quality urbanization (United Nations Human Settlements Programme, 2018). Resilience, defined as a society's capacity to withstand and quickly recover from threats (Jha et al., 2013), is essential. Evaluating the quality of governance is a crucial tool for identifying obstacles that limit equitable and sustainable growth, contributing to Sustainable Development Goal 11, which aims for inclusive, safe, resilient, and sustainable cities through effective urban governance (United Nations, 2019).

1.1. Delimitation of the study area

To better understand the context of the research, it is essential to have information about the geographical boundaries of the study area (Figure 1). According to data from the 'Ordinance for the Reconstruction of Portoviejo: Emergency Measures,' it is concluded that the internal area of 43.10 hectares is bounded by the following streets: "Olmedo, Francisco de P. Moreira, Espejo, Sucre, Francisco Pacheco, Córdova, García Moreno, Alajuela, Manabí, Quito, Callejón Miguelillo, and Ramos Iduarte" (Decentralized Autonomous Municipal Government of Portoviejo, 2016, p. 7).

2. Methods

The methodology used in this study is based on a mixed approach, combining qualitative and quantitative techniques, with both a documentary and field scope (Crotte, 2011) to comprehensively address the evaluation of governance quality in the post-earthquake urban regeneration of Portoviejo's Historic and Commercial Centre. Additionally, descriptive research is the type of research employed, allowing for the description, recording, analysis, and interpretation of current phenomena (Tamayo, 2001) related to urban regeneration in Portoviejo.

The methodological process is divided into three phases, each designed to meet the specific objectives outlined (Figure 2).

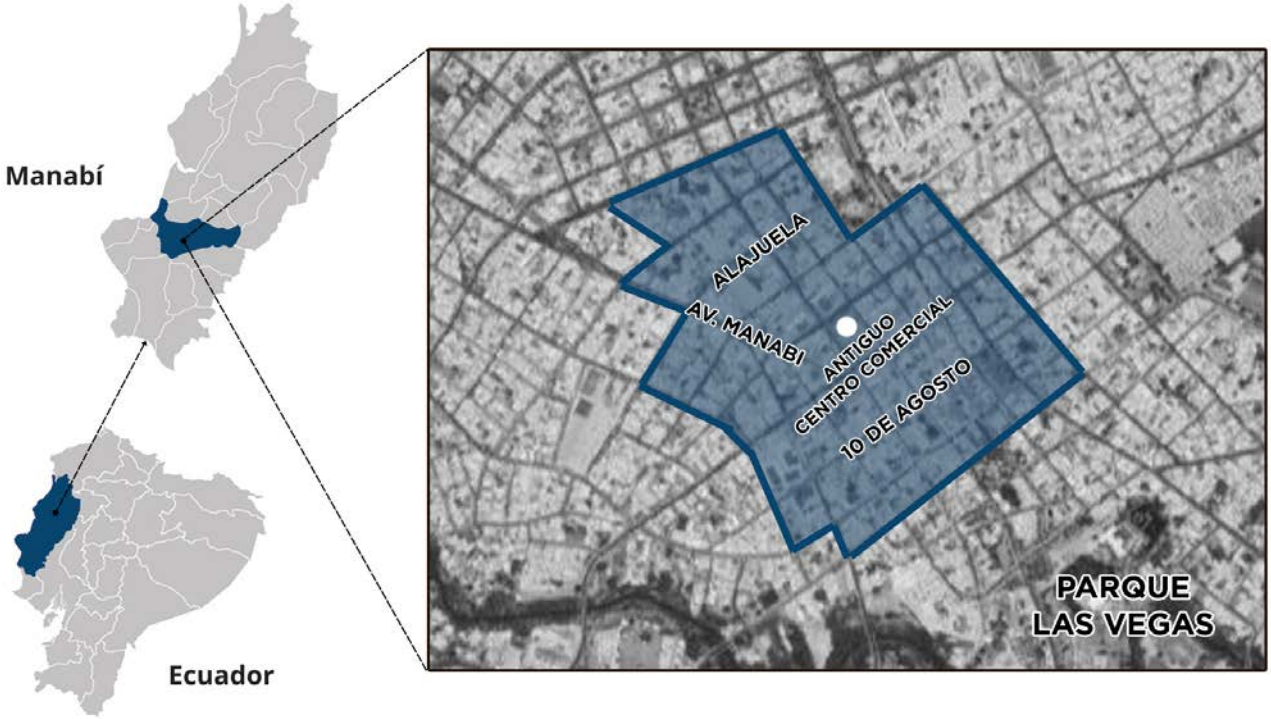
In the first phase, a review of existing documents and literature is conducted, following the Guide: Laboratory of Thought and Languages (Coral, 2016). Additionally, there is a focus on using cartographic tools and graphical material from the specific analysis unit sourced from the geodatabase of the Decentralized Autonomous Municipal Government of Portoviejo, as well as site data collection, as determined by Scientific Observation (Concept, 2021), using key indicators from the Urban Research Manual (Martínez, 1992). This allows for the determination of the characteristics of the Urban Structure before the earthquake (10/04/2016) and after the earthquake (06/01/2024), to conduct a comparative analysis and identify the main physical changes and impacts on the territory (Table 1).

In the second phase, a bibliographic and documentary review of the programs proposed and implemented by the GAD of Portoviejo is conducted. Each program is evaluated using the governance assessment technique from the research titled "Proposal of Indicators for Measuring and Evaluating Governance," which "seeks the ratio obtained from the number of programs developed in the government institution (PI) as the divisor or denominator and the number of programs developed with citizen participation (PCnoI, PCI, PCnoV, and PCV) as the dividend or numerator" (Aguirre, 2019, p. 119). Thus, four specific indicators are highlighted, each with its respective formula, evaluating different aspects of citizen participation, which is not only strategic but essential for conducting an effective governance process (Mayorga and Córdova, 2007).

In the third and final phase, the aim is to understand the opinions and perceptions of residents, experts, and professionals in territorial planning regarding the territorial issues in the study area. Two data collection techniques are employed for individuals who have been directly or indirectly affected by the changes produced by the earthquake and the programs implemented by the Municipal GAD: focus groups (residents and workers in the area), each consisting of four people, based on the "Map Speaks" and "Brainstorming" methods, aiming to "achieve or discover a shared sense structure, well-founded by the contributions of group members" (Martínez, 2004, p. 5). Additionally, interviews are conducted with personnel responsible for territorial planning in the canton, as well as experts in urbanism (Behar, 2008).

The methodological interrelation is achieved through the integration of data collected in the three phases. Information from Phase 1 provides a solid foundation for assessing

Figure 1: Location of the Historic and Commercial Centre of Portoviejo, Ecuador. Ordinance for the Reconstruction of Portoviejo (Gobierno Autónomo Descentralizado Municipal de Portoviejo, 2016) and Authors (2024)



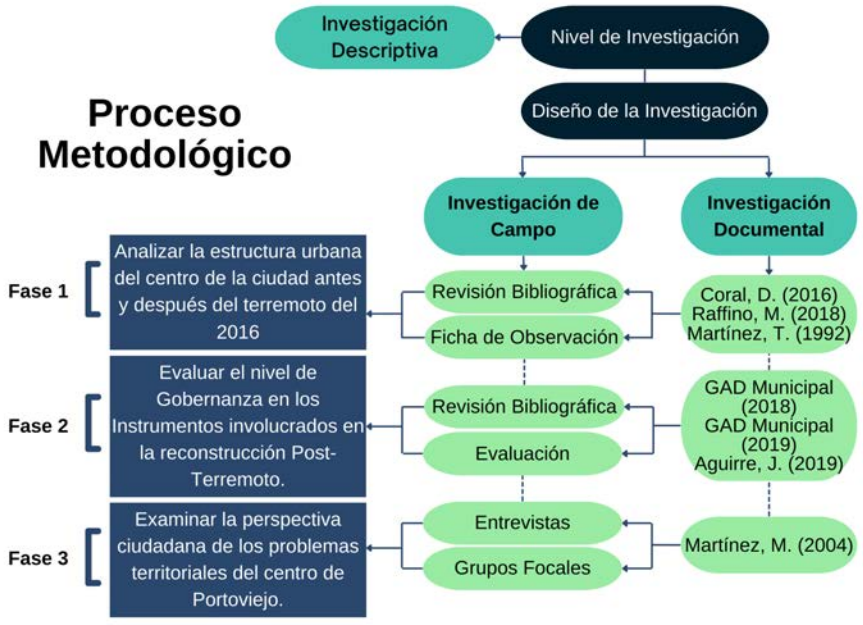


Figure 2: Outline of the Methodology Process. (2024)

the physical and structural impacts of the earthquake. Data from Phase 2 contextualize these changes within the framework of the programs implemented by the local government. Results from Phase 3 enrich the understanding of the changes observed in the previous phases, offering a human perspective on how these changes and policies enacted by the Municipal GAD in the Historic and Commercial Centre have affected the community.

By cross-referencing the data, key patterns and trends can be identified. This enables a comparative analysis that reveals major physical changes and impacts on the urban structure, as well as the quality of governance and the community's perception of these changes.

3. Results

Portoviejo, the capital of Manabí, is a strategic point for exchange, production, and consumption, where commercial, administrative, and bureaucratic activities were centralized in the Historic and Commercial Centre area. In this zone, 10980 people worked, 7792 lived, and 1900 studied, in addition to approximately 1803 people visiting daily for exchange and management activities. This made it a strategic point for economic development in the canton (GAD Portoviejo, 2015).

It had a mixed infrastructure, combining heritage buildings made of clay, guadua bamboo, and wood, which represented the region's identity, with modern constructions. This centre had significant cultural value; however, there was a deficit of public spaces.

On 16th April 2016, a 7,8 magnitude earthquake severely impacted the area, causing the collapse of infrastructure and loss of human lives, which led to its closure for several months, affecting the social, economic, and cultural spheres of all residents in the area (GAD Portoviejo, 2016).

Currently, Portoviejo faces significant socioeconomic challenges due to the earthquake and the recent COVID-19 pandemic, resulting in families living in poverty and notable migration flows. This has affected key activities within the sector, such as commerce, which has not managed to recover despite the urban regeneration programs implemented (Municipal GAD, 2019).

In this context, a phased analysis is conducted to establish a solid foundation for assessing the physical and structural impacts of the earthquake, placing these changes within the context of local government programs, their governance quality, and citizen perspectives.

Indicators of maps to diagnose
Population Density
Land Use
Urban Facilities
Roads and Transportation
Natural Threats and Anthropogenic Risks
Urban Vacancies
Green Areas

Table 1: Indicators of Maps to Diagnose. Urban Research Manual (Martínez, 1992) and authors (2024)

3.1. First phase

Before the earthquake, the population density ranged from 180 to 948 inhabitants per block, with the 180-288 inhabitants range representing 30,80% of the area. After the earthquake, the density decreased significantly, with the range of 48-144 inhabitants now representing 39,33% of the area.

This reduction is due to the collapse of buildings, loss of lives, lack of basic services, and the inaccessibility of the area for six months after the earthquake. Although basic infrastructure has been rehabilitated, many families have not yet rebuilt their homes or businesses, which explains the low density in the area (Figure 3).

Before the earthquake, land use was predominantly mixed (residential at 45,12% and commercial at 36,41%) and institutional (10,37%) in the Central, Northern, and Southern areas. After the earthquake, with the approval of the Portoviejo Plan, it was projected that residential use would increase slightly to 50,45%, and commercial use would grow substantially, exceeding 42%, due to the citizens' need to generate income. Despite these changes in land use, the centre still contains urban vacancies that create insecurity, and the area remains desolate at night (Figure 4).

Similarly, before the earthquake, the predominant urban facilities were neighbourhood and zonal commerce (93,05%), followed by administrative, educational, health, industrial, and socio-cultural facilities. After the earthquake, although commerce still predominates (86,37%), there has been an increase in health and administrative facilities, along with greater diversification, including industrial, social and cultural, educational, recreational, sports, and communication and transportation areas, adapting to the current needs of the community (Figure 4).

Before the earthquake, 100% of the road network in the Historic and Commercial Centre of Portoviejo was asphalted. Currently, approximately 75% of the Central-North sector remains asphalted, while the Northern and Southern areas are paved with concrete or cobblestone due to the "Spatial Plan for Urban Regeneration", which aims to improve urban infrastructure and maximize the use of public space (Figure 5).

Through the counting and analysis of road traffic in the Historic and Commercial Centre of Portoviejo, a varied flow of private vehicles, bicycles, motorcycles, pedestrians, and buses was revealed, especially at 7:00 am and 7:00 pm.

During the day, there is a higher usage of vehicles on streets such as Pedro Gual, Av. Manabí, and Av. Chile. However, at night, mobility decreases significantly in the Central and Northern areas, affecting nighttime activities. Although there are no statistical data from before the earthquake, residents perceive a significant reduction in nighttime mobility due to the low population density following the earthquake (Figure 6).

The Historic and Commercial Centre of Portoviejo presents a high seismic threat with a 96,17% rating. In terms of anthropogenic risk, areas affected by insecurity, drug trafficking and consumption, and sex work were identified with the help of the National Police (Figure 7).

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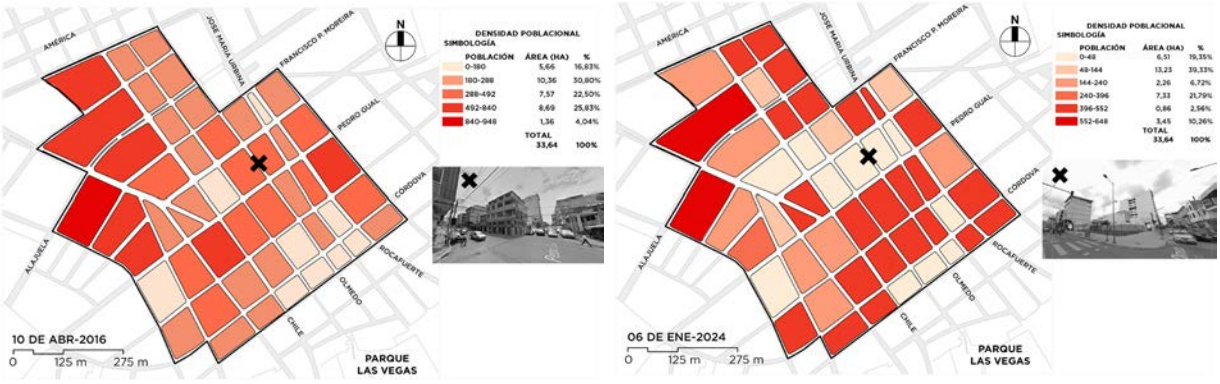

Figure 3: Thematic Map of Population Density, Historic and Commercial Centre of Portoviejo. Portoviejo GEO Portal (2024), INEC (2022), and field research (2024)

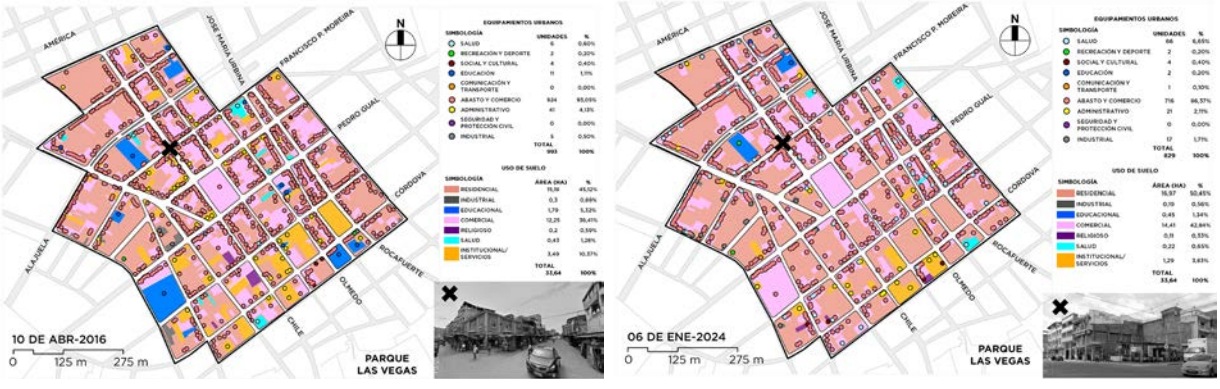

Figure 4: Thematic Map of Urban Facilities and Land Use, Historic and Commercial Centre of Portoviejo. Portoviejo GEO Portal (2024), Portoviejo 2035 Plan (2019), and field research (2024)

According to residents, the area was safe before the earthquake, but the lack of nighttime activities and the decrease in residents have made nights dangerous. This highlights urban vulnerability as a complex and multidimensional phenomenon, compounded by social factors, residential factors, and subjective factors perceived or experienced by the population (Hernández et al., 2018).

Regarding green spaces, the Historic and Commercial Centre has experienced a shortage of green and recreational areas both before and after the earthquake. In 2024, the urban green index was calculated at 1,52 m^2 per inhabitant, with only 0,13 hectares (1300 m^2) available for the projected 1810 people. The GAD of Portoviejo implemented the Juan León Mera Park Regeneration project in response to this situation, but it did not increase the amount of urban green space, as the park already existed (Figure 8).

Finally, before the earthquake, built lots represented 94,65% of the area, while unbuilt lots made up 5,35%. Currently, built lots have decreased to 85,23%, and urban vacancies have increased to 14,77%, reflecting the impact of the earthquake on infrastructure. Previously built areas are now unoccupied, despite the implementation of the Municipal GAD programs (Figure 9).

3.2. Second phase

In the second phase, the process begins with a review of the instruments developed by the Municipal GAD of Portoviejo (Table 2) and employs Aguirre's (2019) methodology to evaluate the quality of governance in the urban regeneration process of the area.

In this way, different categories are established, starting with non-institutionalized participation (PCnoI) as the involvement of citizens in public matters without necessarily being formally organized or represented by established institutions, such as political parties, non-governmental organizations, etc. On the other hand, institutionalized participation (PCI) refers to involvement in public matters through formal and established institutions.

Non-binding participation (PCnoV) is defined as those processes or mechanisms where the opinions,

Figure 5: Thematic Map of Road Condition, Historic and Commercial Centre of Portoviejo. Portoviejo GEO Portal (2024), Portoviejo 2035 Plan (2019), and field research (2024)

Figure 6: Thematic Map of Traffic Flow, Historic and Commercial Centre of Portoviejo. Field research and authors (2024)

proposals, or decisions made by citizens are not mandatory or binding for the authorities or institutions they address. Finally, binding participation (PCV) refers to processes or mechanisms where decisions have a mandatory or binding nature. The scores assigned to each parameter allowed for the calculation of a governance index valued between 0 and 4, revealing a moderate level of governance, with an index of 2.57/4 (Table 3).

In the "Ordinance for the Reconstruction of Portoviejo: Emergency Measures" and the "Portoviejo Plan 2035", the direct interaction of residents and workers with authorities through focus groups was emphasized, without distinction of gender, age, or tenure. This participation was not applied in the "Special Plan for Urban Regeneration of the Centro". In all programs, institutional participation was crucial for organizing and achieving recovery, regulation, and regeneration objectives. Surveys on social networks and public consultations were used to gather citizens' ideas and concerns, which were considered but not mandatory in decision-making.

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In the projects "Strategic Project: Autonomous Shopping Centre #1" and "Project: Regeneration of Juan León Mera Park", local residents influenced decisions through meetings and forums, which did not occur in the "Project: Construction of New Plazas in the Regenerated Zone". External entities, such as neighbourhood committees and merchant associations, acted as intermediaries, gathering information and proposals. Many of the suggestions collected were assessed based on technical and

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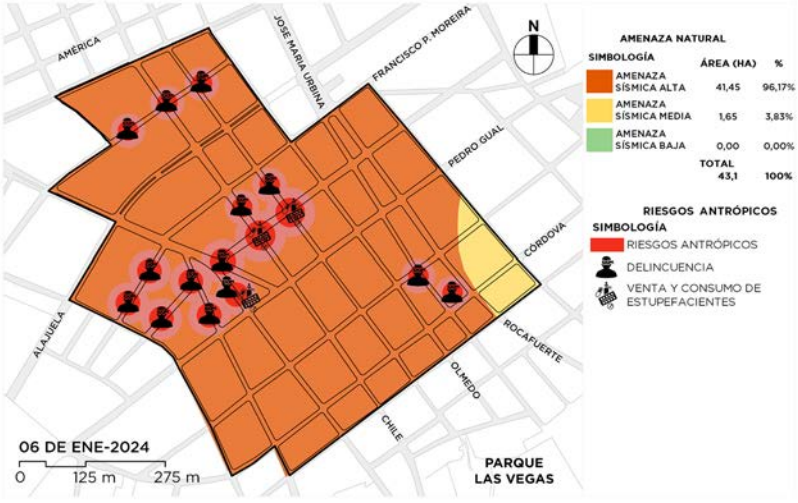

Figure 7: Thematic Map of Natural Threats and Anthropogenic Risks, Historic and Commercial Centre of Portoviejo
Portoviejo GEO Portal (2024) and field research (2024)

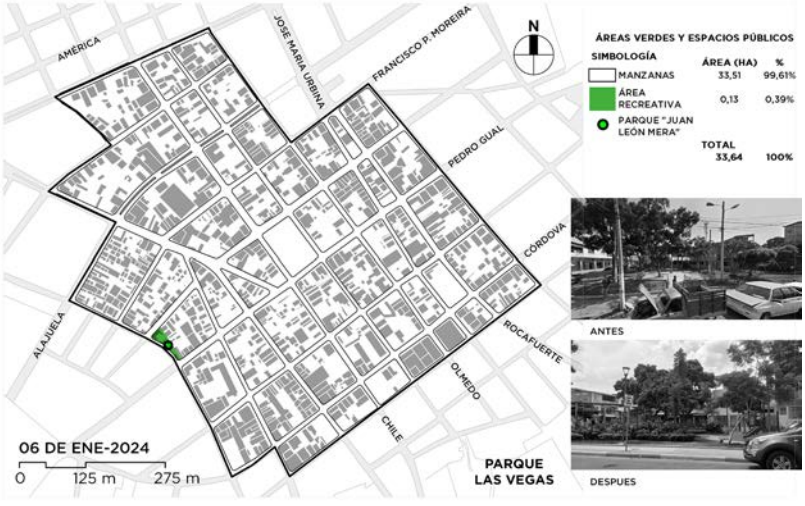

Figure 8: Thematic Map of Green Spaces, Historic and Commercial Centre of Portoviejo
Portoviejo GEO Portal (2024) and field research (2024)

budgetary feasibility, although not always implemented, allowing the authorities to maintain control over the projects.

Participation was binding in aspects related to the safety and accessibility of the park project, where decisions made in formal consultations and approved by planning committees became mandatory guidelines for its construction. This did not occur with the "Strategic Project: Autonomous Commercial Centre #1" and the "Project: Construction of New Plazas in the Regenerated Area".

3.3. Third phase

Despite these efforts, the population density remains low, and the area still faces high insecurity and vulnerability, failing to revitalize the center as a hub of economic and social activities.

Figure 9: Thematic Map of Urban Vacancies, Historic and Commercial Centre of Portoviejo
Portoviejo GEO Portal (2024), Portoviejo 2035 Plan (2019), and field research (2024)

Programs Developed by the Municipal GAD of Portoviejo

Name	Objective	Approval or Execution Date	Status	Background	Impact
Ordinance for the Reconstruction of Portoviejo: Emergency Measures	Reactivate the urban core, reducing vulnerability and providing tools for recovery.	**3rd October 2016 Approval**	Completed	The earthquake left hundreds of lives lost, injured individuals, displaced persons, and destroyed structures within the centre.	Coordinated the evaluation of buildings and actions for recovery in the centre of Portoviejo, but long-term protection measures economically impacted the population.
Portoviejo 2035 Plan	Rezoning of land use and urban development opportunities.	**9th May 2019 Approval**	Completed	Changes in land use post-earthquake.	The rezoning of land use has not fully revitalized the central area.
Special Urban Regeneration Plan for the Portoviejo Centre (Southeast Zone) with its Ordinance	Rebuild the centre to be socially cohesive, inclusive, and economically sustainable, optimizing the use of public space.	**July 2017 Approval**	Completed	The earthquake severely impacted several blocks in the historic and commercial centre.	Improved urban infrastructure in the centre of Portoviejo by expanding pedestrian areas, integrating the river, increasing urban greenery, and undergrounding utilities.
Project: Preparation, Alert, and Disaster Response Systems	Improve disaster response through coordination, early warning, and public education.	**June 2021 Execution**	Completed	The 2016 earthquake left a deep mark on Portoviejo, highlighting the need for effective preparation and response.	Strengthened seismic risk knowledge throughout the Portoviejo canton community, facilitating access to vulnerability data and risk reduction measures.
Strategic Project: Autonomous Commercial Centre #1 (García Moreno and 10 de Agosto Streets)	Build a new retail centre, providing a space for vendors and addressing associated urban issues.	**20th April 2017 Execution**	Completed	The earthquake destroyed the infrastructure of the commercial centre, leading to a decentralization for autonomous trade.	Partially addressed the issues of informal and autonomous trade. However, most of the people affected by the earthquake were not employed in the establishment.
Project: Regeneration of Juan León Mera Park (García Moreno and Pedro Gual Streets)	Transform the Juan León Mera Park into an attractive, inclusive, and functional public space.	**8th March 2021 Execution**	Completed	The park was in poor condition, lacking suitable areas for relaxation and recreation.	The park was regenerated but had little impact on the area, as it only benefited a small group and did not address the deficit of green spaces in the sector.
Project: Construction of New Plazas in the Regenerated Area	Create attractive, inclusive, and functional public spaces for pedestrians and cyclists. In the centre of Portoviejo.	**2017 Approval**	Partial	The earthquake severely impacted several blocks in the historic and commercial centre.	This project is not yet completed, so there has been no increase in public space in the area.

Table 2: Information and Details of the Programs Developed by the Municipal GAD of Portoviejo. Portoviejo 2035 Plan (Municipal GAD of Portoviejo, 2019) and Book 2 (Municipal GAD of Portoviejo, 2018)

In the third phase, participatory methodologies are applied to collect valuable qualitative data, fostering a sense of ownership and responsibility among participants (López, 2010). This allows for a deeper understanding of the foundations of citizen participation, its levels, spaces, times, and how these relate to citizen perceptions of the programs developed and executed by the government within the study area.

This phase complements the results obtained in Phase 2, providing a comprehensive view of governance effectiveness and territorial changes. Thus, focus groups were formed through in-person meetings within the study area with four representatives from the resident population and those working in the area (Table 4). Techniques such as "Mapa Me Habla" and "Lluvia de Ideas" were used to identify, through symbols, the territorial problems observed and proposals for improving the quality of life in the community.

The citizen perception reflected shows a clear disconnect between governmental planning and community needs. Despite the efforts of the Municipal GAD to implement various projects, the lack of effective participation has resulted in solutions that do not address the concerns and needs of the citizens, validating the conclusions of the previous phases.

The population emphasized the lack of urban furniture, recreational areas, and green spaces outside the regenerated zone. Although the "Regeneration Project

Indicators Showing the Governance Index					
Programs Developed by the Municipal GAD	**IG1: Non-Institutionalized Citizen Participation**	**IG2: Institutionalized Citizen Participation**	**IG3: Non-Binding Citizen Participation**	**IG4: Binding Citizen Participation**	**Governance Level (IG1 + IG2 + IG3 + IG4)**
Ordinance for the Reconstruction of Portoviejo: Emergency Measures	1	1	1	0	
Special Urban Regeneration Plan for the Centre of Portoviejo (Southeast Zone) with Its Ordinance	0	1	1	0	
Portoviejo 2035 Plan	1	1	1	0	
Project: Preparedness, Alert, and Disaster Response Systems	0	1	1	0	
Strategic Project: Autonomous Commercial Centre #1	1	1	1	0	**2,57**
Project: Regeneration of Juan León Mera Park	1	1	1	1	
Project: Construction of New Plazas in the Regenerated Area	0	1	0	0	
Total (Applying Formulas):	**IG1 = PCnoI / PI**	**IG2 = PCI / PI**	**IG3 = PCnoV / PI**	**IG4 = PCV / PI**	
	0,57	1,00	0,86	0,14	

Table 3: Indicators Showing the Governance Index. Indicators for Measuring and Evaluating Governance (Aguirre, 2019, and authors, 2024)

		Focus groups	
		Resident Population	**People who work in the area**
Women	0 - 18 years	1	0
	19 - 40 years	0	2
	41 - 60 years	1	0
	61 years and older	0	0
Men	0 - 18 years	0	1
	19 - 40 years	1	1
	41 - 60 years	1	0
	61 years and older	0	0
Total		**4**	**4**

Table 4: Age Group of Focus Groups. (2024)

for Parque Juan León Mera" aimed to transform the park into an attractive and functional public space, its impact was limited, benefiting only a small group and not addressing the widespread need in other parts of the area.

Additionally, the lack and insufficiency of street lighting and nighttime power outages in the central northern and southern areas, adjacent to the former Central Commercial Sector, contribute to the perceived insecurity. Programs such as the "Ordinance for the Reconstruction of Portoviejo: Emergency Measures" and the "Strategic Project: Autonomous Commercial Centre #1" attempted to improve infrastructure but did not fully address the insecurity and vulnerability in the area.

Residents expressed their dissatisfaction with the condition of certain vehicular and pedestrian routes neglected outside the regenerated area, related to the "Special Urban Regeneration Plan for the Centre of Portoviejo", which improved urban infrastructure within the regenerated area but did not extend to the neglected peripheral areas.

The presence of litter and unpleasant odours in the northern part of the city and deficiencies in the potable water service in large parts of the area during certain times of the year were also significant issues that were not addressed in any of the reviewed programs. This indicates a significant omission in the planning of essential basic services and the execution of urban regeneration.

The absence of bike lanes on streets outside the regenerated zone is another issue affecting cyclists' safety due to high traffic flow. The "Project for the Construction of New Plazas in the Regenerated Zone" aimed to create functional public spaces for pedestrians and cyclists, but it has not yet been completed, preventing the effective implementation of the necessary bike lanes.

Figure 10: Me Habla Map and Brainstorming, Portoviejo Historical and Commercial Centre. Portoviejo GEO Portal (2024) and field research (2024)

Finally, residents pointed out issues with connectivity and accessibility between different commercial facilities and their surroundings due to conflicts at intersections outside the regenerated area. The development of the "Plan Portoviejo 2035", which aims to improve and regulate zoning and land use, has not fully addressed these connectivity problems, highlighting the need for more comprehensive and coherent planning (Figure 10).

4. Discussion and conclusions

In this way, the studied phases reveal the interaction triangle of the three dimensions of the habitat. In Phase 1, *Urbs* represents the physical configuration evidenced in the thematic maps of territorial changes. In Phase 2, *POLIS* gains relevance due to the power dynamics between urban actors and the need for effective governance. Finally, in Phase 3, *CIVITAS* is affected by decisions that impact the territories, reflecting a lack of consideration in the proposed solutions to rebuild a fragmented physical, social, and economic structure (López, 2010).

This research reveals that the configuration of the habitat following the 2016 earthquake was severely affected. One recurring issue is the lack of citizen participation in governance processes, which prevents a clear understanding of the community's needs. Despite the local government implementing programs and projects to mitigate the earthquake's impacts, the lack of inclusion has resulted in a fractured population struggling to fully recover.

In Latin American literature on urban regeneration, while natural and anthropic threats are not explicitly mentioned, climate change and pollution are recognized as significant challenges and disaster risk factors. It is important to note that risk is a social construct influenced by the built environment and urbanization processes (Sarmiento et al., 2020).

Before the April 16, 2016, earthquake, the Historic and Commercial Centre of Portoviejo had a high population density, which increased its "seismic vulnerability, as in addition to the earthquake's strength, vulnerability depends on population density" (Djordjević et al., 2016, p. 353). After the earthquake, the population density decreased significantly due to the destruction of homes and inadequate relocation decisions, reflecting the lack of governance and citizen participation.

Regarding land use, the area follows a mixed-use approach, where the actions of the Municipal GAD aim to economically revitalize the area and balance daytime and nighttime activities, emphasizing the need for comprehensive "and sustainable territorial planning that promotes the rational use of natural and historical-cultural resources" (Izakovičová et al., 2018, p. 1). However, urban facilities reveal shortcomings in government planning, highlighting the lack of focus on "sustainability and resilience, key aspects of planning" (Ramirez and Grijalba, 2020, p. 1), which are essential for ensuring an equitable environment and promoting sustainable development.

Regarding road conditions, the lack of community participation in urban regeneration did not prevent local authorities from improving infrastructure, creating a "more compact, healthier, and sustainable city, aiming to reduce environmental, social, and behavioural risks" (Giles et al., 2016, p. 2912).

Urban mobility exhibited distinct patterns before and after the earthquake, with high daytime activity and a decrease at night, leading to insecurity and negatively impacting activities. This presents "challenges and opportunities in urban planning, as they combine fixed and mobile functions" (Mastroianni et al., 2015, p. 1), highlighting the need to consider both daytime and nighttime mobility to foster a more active urban environment.

Regarding areas prone to active seismic faults and old buildings, these factors increase social vulnerability, which contributed to the development of programs aimed at strengthening building codes and disaster education. However, these programs did not integrate citizen participation, which is crucial to "understanding

the impact and prioritizing actions that enhance resilience and disaster prevention measures" (Xofi et al., 2022, p. 1154).

Anthropic risk is high due to the lack of effective policies and community programs to address insecurity, which discourages residents from using public spaces and affects quality of life, where "the territory plays a key role in social intervention and crime prevention" (Pitarch and Uceda, 2015, p. 505). Collaboration between local authorities, police, and the community is crucial to address "urban insecurity caused by social cohesion and socioeconomic inequalities" (Stefanizzi and Verdolini, 2019, p. 1165).

On the other hand, the Juan León Mera Park Regeneration Project, although it had inclusive governance, has not managed to solve the shortage of green spaces. The WHO recommends 9 to 15 m^2 of green space per person to improve quality of life (World Health Organization, 2017), where the deficit in green spaces reflects a governmental neglect of the need for green areas that provide various benefits.

The 2016 earthquake left behind large "vacant lots, abandoned and ruined buildings, which present challenges for sustainable planning and quality of life" (Hwang and Lee, 2020, p. 540). Urban voids "can be valuable resources for city development if managed effectively and integrated into the urban fabric" (Omar and Saeed, 2019), but the lack of attractive projects and the economic deterioration of the population have prevented the densification and revitalization of the area even years after the earthquake. Inclusive and participatory governance could bridge this gap and improve urban continuity.

The urban structure of the study area faces various problems and deficiencies attributed to the earthquake and the lack of programs that address citizen needs. Furthermore, the absence of a cohesive social habitat has exacerbated these issues, preventing the community from fully recovering and actively contributing to the revitalization of the area. The lack of adequate public spaces, basic services, and recreational areas has limited social interactions and community development, which are essential elements for a healthy and resilient social habitat.

The instruments developed by the GAD Municipal and community participation reveal a moderate level of governance, with partial implementation of programs and an insufficient regulatory framework. Citizen participation is a fundamental axis for the quality of governance and needs to be strengthened to improve transparency, accountability, and inclusive decision-making. The indicators used to assess governance quality, which include institutionalized, non-institutionalized, binding, and non-binding participation, are crucial for integrating and promoting these types of participation and fully addressing citizen needs, ensuring that they are genuinely considered and addressed.

For example, improving institutional response and its impact on the built environment requires efficient coordination of all stages of the process, both before and after the disaster, to better utilize resources and address existing problems. Governance that understands the complete cycle and evolutionary resilience is essential to view the disaster as an opportunity, encompassing emergency preparedness, reconstruction, and urban design (Wagemann et al., 2020).

Participants in the focus groups expressed a strong feeling of disconnection with the GAD of Portoviejo regarding decision-making for project development. This sentiment is reflected in persistent territorial problems, such as the lack of urban furniture, recreational and green areas, insecurity due to insufficient public lighting and nighttime power outages, poor road conditions, garbage presence, absence of bike lanes, and difficulties in connectivity between urban facilities—issues that negatively affect the community's quality of life.

Experts indicate that these problems significantly impact daily life. The lack of binding and transparent citizen participation hinders the sustainable development of the environment, worsening the situation for residents. It is crucial to improve communication and community participation to achieve comprehensive and sustainable regeneration, learning from past experiences to enhance future processes and ensure equitable development of the area.

Reducing social vulnerability requires understanding various elements that influence the structure and dynamics of a city. Aspects such as urban configuration, and historical, cultural, economic, and social factors are essential for addressing the challenges of a habitat. This holistic approach facilitates comprehensive territorial planning, where governance is crucial, coordinating policies, the participation of multiple actors, and inclusive decision-making for effective and equitable management. By integrating these considerations into post-disaster reconstruction, it is possible to achieve sustainable development that restores physical infrastructure, promotes community resilience, and improves quality of life.

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