Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 12, 669-679
2025
Publisher: Learning Gate
DOI: 10.55214/2576-8484.v9i12.11474

Analysis of the social housing rehabilitation process in Sub-Saharan Africa: The cases of barrio chino and Los Ángeles in Malabo, Equatorial Guinea

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Abstract: Access to decent housing remains a major concern for many households worldwide. This issue is recurrent in cities across sub-Saharan Africa, particularly in Malabo, the administrative capital of Equatorial Guinea, where several social housing projects have been implemented to address the housing shortage. However, these cities are experiencing accelerated deterioration. This deterioration is mainly the result of inappropriate material choices, insufficient maintenance, and the lack of a clear strategy defining the framework for their rehabilitation. Since 2014, sporadic interventions have been implemented to improve the living conditions of residents in social housing estates in Malabo, particularly Los Ángeles and Barrio Chino. However, these actions, often dictated by political considerations and specific events, focus primarily on the physical aspect of buildings, neglecting social, economic, and environmental dimensions. The objective of this research is to analyze the methods used in the rehabilitation of social housing in Malabo. The methodological approach adopted combines both qualitative and quantitative data. A bibliographic review of available empirical resources was conducted to identify the actors involved and evaluate current intervention processes. The results of the study highlight the involvement of a multitude of actors in rehabilitation operations, the ad hoc and summary nature of the work carried out, and the need to adopt an integrated and participatory approach to improve decision-making in future social housing rehabilitation operations in Malabo.

Keywords: *Degradation, Intervention strategies, Malabo, Rehabilitation, Social housing.*

1. Introduction

The phenomenon of rapid urbanization is one of the most significant transformations that countries are experiencing, for which cities, particularly those in Africa, are ill-prepared. The urbanization rate in Africa, which was estimated at 15% in the 1960s, reached 40% in 2010 and 44.4% in 2022. This proportion could reach around 60% by 2050 [1, 2]. This accelerated urbanization is causing numerous problems, including difficult access to decent housing for many households. To address this situation at the institutional level, governments have intervened by providing funding for the construction of social housing.

It is with this in mind that various social housing programs have been launched across Africa, such as 100,000 homes in Senegal, 150,000 in Côte d'Ivoire, 40,000 in Burkina Faso, and 20,000 in Benin [3]. In many cases, these cities are built using unsuitable materials and techniques [4], compromising their structure and durability. These technical shortcomings lead to the proliferation of poor-quality housing and have a significant impact on the quality of life of the communities living there. This situation stems mainly from government budget constraints [5]. In addition, these dwellings often suffer from insufficient maintenance, which accelerates their deterioration [6]. Furthermore, they are often

History: Received: 17 September 2025; Revised: 6 November 2025; Accepted: 10 November 2025; Published: 16 December 2025
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designed without sufficient consideration of the actual needs or cultural specificities of future residents [7].

As a result, dwellings are frequently modified by their occupants after delivery [8]. These transformations, generally carried out informally, contribute to the socio-spatial degradation of neighborhoods. This is a consequence of the lack of clearly defined housing policies [9]. Beyond the transformations, this deterioration is also attributable to insufficient monitoring of social housing projects during the construction phase. On this subject, Mouaziz-Bouchentouf [10] points out that the "fate" of social housing is often linked to a lack of interest on the part of developers, particularly due to the absence of post-construction evaluation studies. Faced with these numerous shortcomings, renovation is the only viable solution to address the deterioration of social housing.

Often designed in a fragmented manner and without a unified vision [11], the rehabilitation of social housing is generally carried out on an emergency basis. Indeed, this approach sometimes overlooks historicity, symbols, uses of space, and even the needs of populations [12]. Often based on international methods, building rehabilitation therefore struggles to adapt to the specificities of the African context and does not fully meet current construction standards [13]. Most research on rehabilitation focuses on the urban scale, while the scale of housing and interior spaces remains insufficiently explored [14]. However, in a context where sustainable development is a central driver of urban policies, it is imperative to promote rehabilitation operations that include a sustainable perspective, particularly in African cities.

In Malabo, two neighborhoods, Barrio Chino and Los Ángeles, each received funding for renovation work. In 2023, the government decided to formalize these isolated interventions into a program aimed at improving the living conditions of the populations in Malabo and Bata. Despite the efforts made, the rehabilitation methods adopted have focused on the physical aspect of the buildings, while neglecting certain qualitative aspects necessary to ensure their long-term effectiveness. These actions seem to lack strategy, a participatory approach, and consideration of the social, economic, and technical dimensions of rehabilitation. As a result, the problem of degradation persists. Although initiatives aimed at improving the living conditions of the population have been undertaken, these actions remain sporadic and insufficient. It is within this context of providing solutions for the sustainable rehabilitation of social housing in this capital city that this study is necessary. Thus, its objective is to fill the gaps in the availability of scientific data on intervention methods for deteriorating social housing estates in Malabo. Specifically, this involves:

- Identify the actors involved in this rehabilitation operation in Malabo.
- To present the current process of rehabilitating social housing in this city.
- Analyze resident satisfaction in renovated social housing estates.
- Propose measures for the sustainable rehabilitation of these neighborhoods.

2. Materials and Methods

2.1. Presentation of the Study Area

The city of Malabo, the economic capital of Equatorial Guinea, serves a dual function as both the provincial capital and a municipality with full powers. Located at 3° 45′ 07″ north latitude and 8° 46′ 25″ east longitude, it is approximately 17 km from Baney, the second-largest municipality in the region. Malabo enjoys an average annual temperature of 25°C and 2,183 mm of rainfall per year [15]. Its maximum altitude reaches 3,011 meters above sea level. Thanks to its island location and strategic position, it is an attractive and dynamic hub for the country's trade and industry. Originally organized into five administrative units called urban districts (1990), the city underwent a major territorial reform in 2017. In accordance with Law No. 3/2017 of June 20, 2017, three rural localities were incorporated into the municipality, bringing the number of urban districts to eight. The municipality covered an area of 60 km² according to the 2007 Local Urban Development Plan. Today, the urban area extends to nearly 118 km². Furthermore, according to Equatorial Guinea's first national census of population and

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 12: 669-679, 2025
DOI: 10.55214/2576-8484.v9i12.11474

housing in 1983, Malabo's population was estimated at 31,000 inhabitants. According to the latest census in 2015, it had a population of approximately 271,008 [16]. Finally, in 2024, the city's population is estimated at 366,157. Map 1 shows the location of the municipality of Malabo.

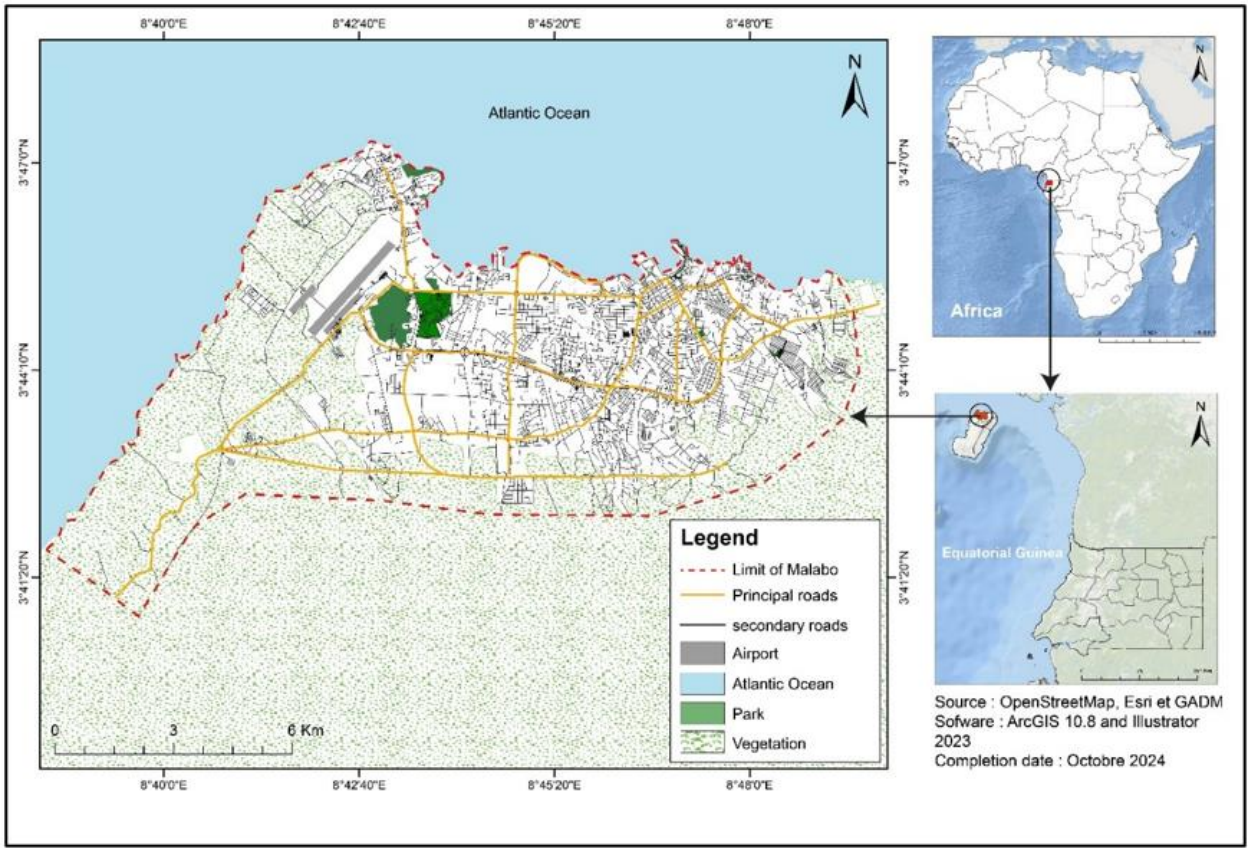

Figure 1.
Perimeter and location of the study area.

2.2. Data Collection and Processing

To develop a comprehensive understanding of the situation, this study was conducted using a mixed methodology combining documentary research, observations, and interviews with residents of the social housing units studied, as well as with public and private institutions involved in the social housing rehabilitation process. The documentation has enabled us to compile a state-of-the-art report on the rehabilitation and transformation of residential areas in various regions. Field observations and photographic records enabled us to identify and describe all stages of the social housing rehabilitation process. In Malabo, we examined the cases of the Los Ángeles and Barrio Chino social housing estates, which have already undergone renovation. This comparative approach involved an in-depth analysis of the renovation programs implemented by the public authorities. As shown in Table 1 below, interviews were conducted with professionals in the sector, construction companies, social housing managers, and resident heads of households. They helped to highlight the diversity of problems faced by the rehabilitation operation, as well as the causes and consequences of interventions in the cities studied. Satisfaction surveys were conducted among eighty (80) residents (forty (40) per housing project) to assess their level of satisfaction, their sense of well-being, and their perceptions and expectations regarding the operations carried out.

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Table 1.
Profile of interviewees.

Structure	Profile	Seniority (number of years)	Workforce	Total
Directorate General for Housing (DGH)/General Directorate of Housing (DGV)	Architect-Urban Planner (site supervisor)	13	1	87
	Architect (member of the social housing monitoring committee)	10	1	
	Engineer	21	1	
General Directorate of Urban Planning (DGU) / General Directorate of Urban Planning (DGU)	Head of Urban Planning Section	18	1	
National Real Estate Management Entity of Equatorial Guinea (ENPIGE)	Management Supervisor	15	1	
China Dalian	Site engineer	15	1	
Project Planning Office (Ge-proyectos)	Monitoring and control officer	8	1	
Social housing residents	Heads of households	9-63	80	

In order to ensure the accuracy of the data collected during the interviews, a number of criteria were defined. For professionals from public and private institutions, participants had to demonstrate a minimum of five (5) years' experience in the sector and have held a position of responsibility in this field. Residents of social housing estates must also provide proof of at least five (5) years' seniority in the residence. Regarding the neighborhoods, the focus was on those that had undergone a rehabilitation program, namely Los Ángeles and Barrio Chino. The data collected was formatted using Word, and the maps were produced using ArcGIS 10.8 and Illustrator software.

3. Analysis and Interpretation of Results

3.1. Characteristics of the Cities Studies

Barrio Chino is a residential neighborhood designed during the colonial period as part of the first five-year plan (1963–1967). Covering an area of 2 hectares, it is structured around three blocks of buildings arranged in a U-shape, forming a central space comprising 114 housing units. In terms of urban planning, the central courtyard, although lacking any specific amenities, is used both as a parking area and a playground. As for Los Ángeles, which covers an area of 6 hectares, it consists of 64 semi-collective residential blocks. Each block comprises eight single-family duplex dwellings, making a total of 512 housing units. This housing estate, built over an estimated period of five years between 1963 and 1967, features two types of housing units designated A and B, each with an estimated floor area of 63 m². These dwellings are divided into three distinct sectors. The first, located near the central market called "Los Ángeles de mercado," comprises 10 blocks and represents 80 housing units. The second, known as the Los Ángeles pharmacy sector, comprises 22 blocks corresponding to 173 dwellings. Finally, the last sector, located near the Neighborhood service and called "Los Ángeles Base" by residents, encompasses 32 blocks with a total of 256 housing units. In addition, a central "sub-sector" is reserved for ancillary equipment. Table 2 summarizes the characteristics of these two cities.

Table 2.
Characteristics of the cities.

City	Geographical location	Year of design	Type of housing	Area of the city (m2)	Number of inhabitants (2024)	Number of blocks	Number of dwellings	Living area (m2)
Los Ángeles	Northeast of Malabo	1963-1967	R+1	66 000	4096	64	512	63
Barrio Chino	Northeast of Malabo	1963-1967	R+2 R+3	5 000	528	3	114	72,25

Edelweiss Applied Science and Technology
ISSN: 2576-8484
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3.2. Overview of the Social Housing Estates Studied Prior To Intervention

3.2.1. Los Ángeles Neighborhood

With a total of 64 residential blocks comprising eight (8) housing units each, the Los Ángeles neighborhood has 512 dwellings. One of the strengths of the city of Los Angeles is its proximity to local amenities, including the National University, schools, the central market, and a supermarket. However, within the city, there is a lack of community spaces. By 2020, malfunctions had become so common that residents filed several complaints with the relevant authorities. This led to a visit by officials in 2022 to assess the extent of the damage. The observed malfunctions concern the sanitation system, the drinking water supply, electrical installations, and the advanced deterioration of facades. Of the 40 residents surveyed, only 13% have access to drinking water, 8% experience irregular supply, and 79% are forced to travel to obtain it. The renovation project was part of a plan to improve urban and residential conditions in the Los Ángeles neighborhood. The following photographs show the condition of the Los Ángeles housing project before renovation.

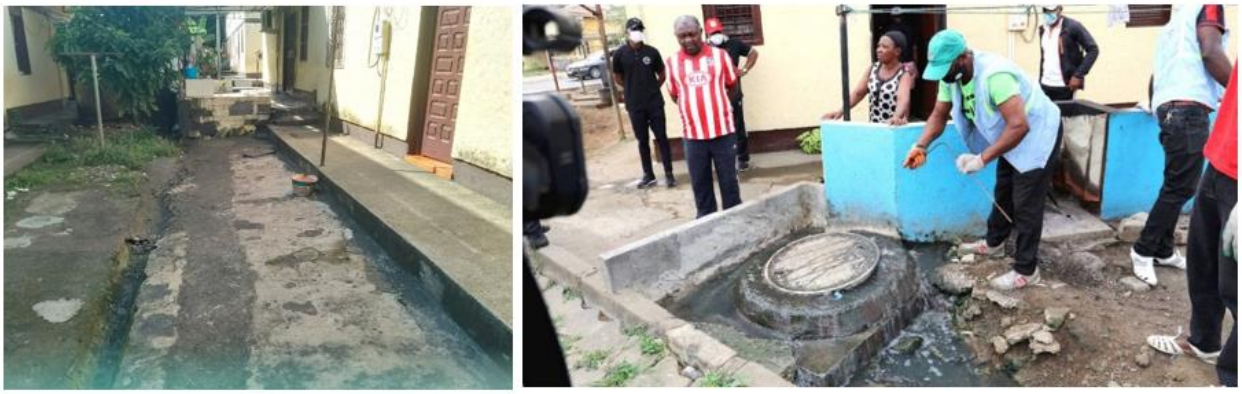

Figure 2.
Overview of the condition of the Los Ángeles neighborhood prior to rehabilitation.

3.2.2. Barrio Chino Neighborhood

The residential complex in the Barrio Chino neighborhood, consisting of three (3) blocks, comprises a total of 114 housing units. It is characterized by its single functionality, offering only one type of residential use, without any accompanying facilities. Around 2011, recurring problems were reported within the city. Residents, faced with a gradual deterioration in their living environment, lodged numerous complaints with the relevant authorities, leading to an initial intervention in 2014. The following images show an aspect of the public space (A) and the state of deterioration of a bathroom (B).

Edelweiss Applied Science and Technology
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Figure 3.
Overview of the state of Barrio Chino before rehabilitation.

3.3. Actors Involved in the Rehabilitation Process

The results of the interviews show that in Malabo, the actors involved in the social housing rehabilitation process are divided into three (3) spheres, as presented below.

3.3.1. Political and Institutional Actors

In Equatorial Guinea, particularly in Malabo, rehabilitation operations are carried out by an administrative body responsible for implementing the decisions and directives of the State. This institutional body is composed of three main structures involved in the upstream and downstream phases of the project. Firstly, the Ministry of Public Works, Housing and Urban Development (Ministerio de Obras Públicas, Vivienda y Urbanismo – MOPVU) is responsible for planning construction projects, mainly through the Housing Directorate. GE-Proyectos (Oficina de Planificación de Proyectos de Guinea Ecuatorial) is responsible for the technical supervision of the execution of the works, as well as the monitoring and control of the interventions. Finally, the National Real Estate Promotion Agency of Equatorial Guinea (Ente Público de Gestión Inmobiliaria de Guinea Ecuatorial – ENPIGE) manages social housing estates on behalf of the state. It should be noted that the latter two entities have the status of parastatal companies.

3.3.2. Economic Actors: Companies and Construction Professionals

The implementation of social housing renovation works is entrusted to construction companies designated by the Ministry of Public Works, Housing, and Urban Development (MOPVU). The criteria for selecting these companies vary depending on the context and specific constraints of each project. In the absence of companies specializing in renovation in the region, the government is turning to foreign companies that have already designed and built social housing. This approach was implemented in 2024 with the appointment of China Dalian, the company responsible for building more than 50% of the social housing units under the Horizon 2020 Plan. This strategic program, developed by the government to elevate the country to the status of an emerging economy by 2020, was based on several pillars, including the implementation of a policy to develop infrastructure and basic services. Among its major objectives, the production of social housing was a central focus. In this context, in 2024, China Dalian was commissioned to renovate more than 5,000 housing units.

Another option is to use a call for expressions of interest, allowing construction companies to offer their collaboration for the renovation without direct funding from the government. This strategy was

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ISSN: 2576-8484
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adopted for the renovation work on the Los Angeles housing project in 2023. Although the Ministry of Public Works, Housing, and Urban Development and GE-Proyectos have technical units staffed by qualified professionals (architects, urban planners, surveyors, engineers, etc.), their expertise is not always fully utilized in the context of social housing rehabilitation projects. Often, these experts are not involved in the decision-making process and discover that interventions have been carried out without having been informed beforehand. This lack of consultation limits the contribution of their expertise and significantly affects the quality and consistency of the operations implemented.

3.3.3. Social Actors: Residents

In Malabo, as in other developing countries, improving living conditions depends on institutional and economic factors. Although residents of social housing estates are the main beneficiaries of these projects, they are hardly involved in the planning and implementation of rehabilitation operations. In fact, 63% of residents interviewed emphasize that the rehabilitation initiatives undertaken are to be commended. However, they regret not having been sufficiently informed about the scope of the work undertaken. Some of them even claim that the work has worsened their quality of life. There is concern about poor rainwater drainage leading to an increase in mosquitoes, as well as the worsening of problems with the drinking water supply system, particularly in the kitchen and bathroom. In addition, if they had been consulted, they would have requested the development of green spaces and other recreational areas, as well as the creation of playgrounds for children, etc.

3.4. Rehabilitation Process for the Cities Studied

Figure 3 presents a summary of the rehabilitation process for the Los Angeles and Barrio Chino neighborhoods in Malabo. This graph shows that the analysis of rehabilitation needs is largely neglected by public authorities. This observation is made by 9% of stakeholders in Los Angeles and 6% in Barrio Chino. Furthermore, the time taken to identify damage in housing estates is very short. This is highlighted for Los Angeles and Barrio Chino by 17.5% and 12.5% of stakeholders, respectively. In fact, since the construction of public buildings, including social housing and administrative facilities in Malabo, rehabilitation operations have been infrequent. Since 2014, due to the accelerated deterioration of social housing estates, measures have been implemented to improve the living environment of resident communities. However, these initiatives occur amid an economic recession that has affected the country since 2014. According to information gathered from the Ministry of Public Works, Housing, and Urban Development, it is clear that the deterioration of housing projects requires urgent intervention.

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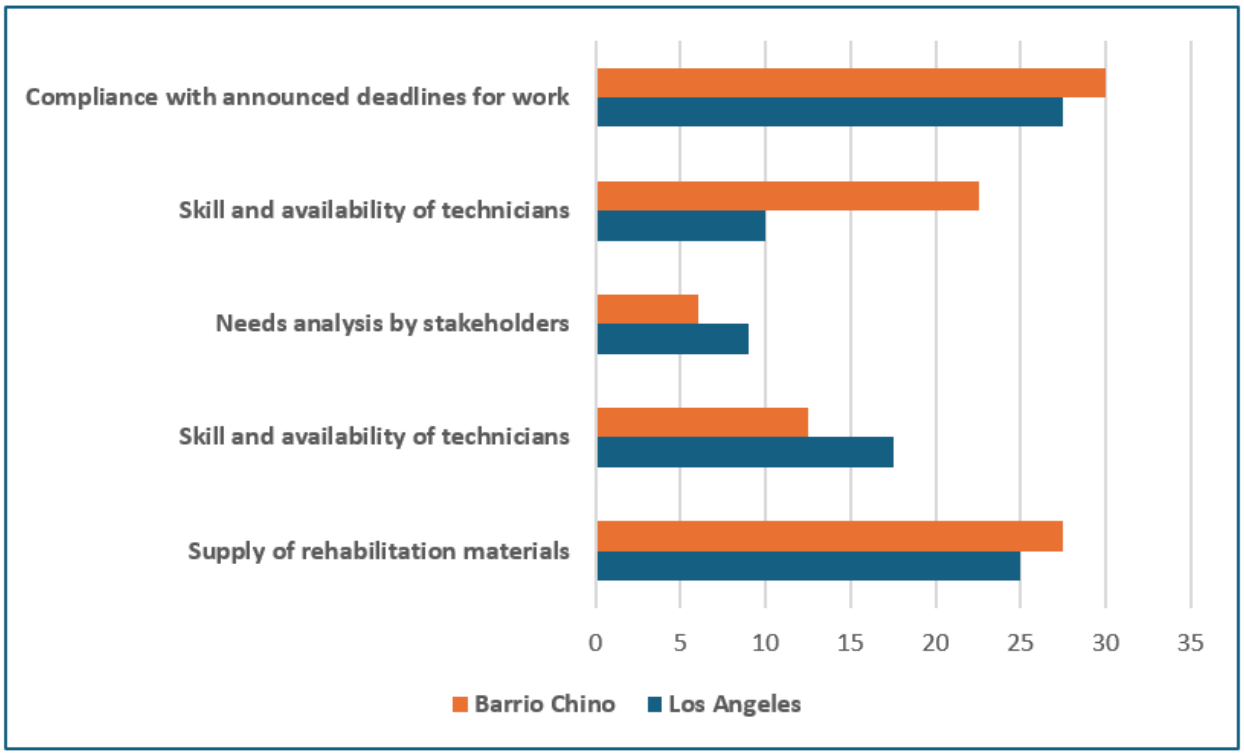

Figure 4.
Perceptions of those responsible for the rehabilitation of social housing estates.

3.5. Analysis of Residents' Perceptions of the Rehabilitation of Their Housing Estates

In Table 3, we present the satisfaction levels of residents in the two cities studied after the work was completed. We chose three variables for analysis to express this sentiment: these are the neighborhood, housing, and social impact. According to residents of both neighborhoods, the renovation work carried out has created green spaces in the Los Angeles neighborhood (65%), unlike the Barrio Chino neighborhood, which has remained in its original state, according to 5% of residents. In addition, 68% of Barrio Chino residents said that the renovation project had preserved the parking area. However, 25% of Los Angeles residents are forced to park their vehicles informally in areas near their neighborhoods. Regarding moisture-related problems in housing, 5% of residents in both housing projects stated that no solution had been found. Concerning information and citizen involvement in the rehabilitation process, respondents emphasized that they had been little involved in the various phases of the rehabilitation process, whether in Los Angeles (15%) or Barrio Chino (10%).

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 12: 669-679, 2025
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Table 3.
Residents' perceptions of the rehabilitation of the Los Ángeles and Barrio Chino neighborhoods.

Typology	Criteria	Los Ángeles (%)	Barrio Chino (%)
Neighborhood	Accessibility	15	5
	Parking area	25	68
	Street lighting	15	15
	Waste management	35	35
	Green space and street furniture	65	5
Housing	Space solution	5	5
	Lighting	5	5
	Ventilation	5	5
	Access to safe drinking water	15	15
	Sanitation	10	10
	Solution against humidity	5	5
Social impact and inclusion	Resident information and involvement in the process	15	10
	Strengthening ties	10	10
	Management of common areas in the city	5	5

4. Discussion

The social housing estates Los Ángeles and Barrio Chino in Malabo have undergone selective redevelopment as part of a renovation program launched by the public authorities. Despite some notable progress, their state of deterioration persists because the methods and techniques adopted during the operation focused solely on the physical aspects of the buildings. This does not allow for any real improvement in residents' living conditions or the sustainability of their housing. A study conducted by Behloul [17] shows that these types of rehabilitation operations are sporadic and irregular, as they occur during official visits by political figures or in the run-up to an event. According to Benabadji and Bencherif [18] the objective of these operations is to guarantee the sustainability of residential real estate assets while ensuring their transfer to future generations [18]. Beyond the urban scale, rehabilitation should also extend to the architectural scale. On this subject, Calvano, et al. [19] emphasize that a comprehensive approach is essential for social housing estates, combining interventions on housing and public services. Such a strategy makes it possible to better target the actions needed to address physical, social, and economic degradation [4]. For his part, Casanovas Boixereu [11] emphasizes the importance of observation and understanding as prerequisites for any intervention. According to him, effective renovation relies on in-depth knowledge of the technical and structural characteristics of buildings, such as the specific features of reinforced concrete, the use of local materials, and the specific needs of occupants.

A pool of actors is involved in the rehabilitation of these two cities, namely, actors from the institutional sphere, which includes state institutions; actors from the economic sphere, which includes companies responsible for carrying out the work and construction professionals; and finally, actors from the social sphere, which includes residents of the various cities. Research conducted by Bekinschtein [4] revealed that such an operation requires an integrated approach that considers legal, administrative, technical, and sociocultural dimensions. For Devaux [20] this approach of involving stakeholders promotes the co-construction of projects and strengthens residents' sense of belonging. The purpose of the renovation work undertaken is to address the problems of deterioration that have been observed. However, 5% of those interviewed pointed out that the work was limited to maintenance or beautification, replacement of floor coverings, repair of false ceilings, treatment of moisture-related problems, etc. The results of the work carried out by Courbebaisse and Issot [12] showed that, in addition to all the actions mentioned above, the rehabilitation process must take into account the history, symbols, uses of spaces, and needs of the population.

The rehabilitation of social housing in Malabo requires an integrated approach, combining technical interventions, the provision of essential equipment and services, participatory governance, and the

Edelweiss Applied Science and Technology
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promotion of living heritage. This holistic strategy, rooted in local realities, is essential to ensuring the sustainability of projects and bringing about lasting improvements to residents' living environments and conditions. It will enable us to respond to the complex challenges posed by the physical deterioration of housing, the obsolescence of infrastructure, and the socio-cultural needs of residents. Therefore, before taking any action, it is crucial to define the objectives of the rehabilitation. This precaution allows for the structuring of the actions to be taken and ensures consistency in the interventions. The advanced state of deterioration of social housing, particularly that dating from the colonial period, requires targeted technical interventions. These should aim to reduce energy consumption, improve lighting, natural ventilation, and modernize water, sanitation, and electricity facilities. These measures are in line with the principles of ecological urban planning, which advocates the use of sustainable materials and the implementation of bioclimatic solutions to improve residents' comfort while respecting the environment.

Interviews conducted with residents of social housing estates reveal a fundamental need: to live close to essential facilities and services. Thus, rehabilitation should include the creation or revitalization of commercial areas, cultural spaces, meeting places, and children's playgrounds. This approach promotes functional diversity and strengthens the social fabric of the neighborhood. Examples such as Village Oasis in Haiti illustrate the effectiveness of this strategy, where the integration of community infrastructure has helped improve residents' quality of life. The management of social housing estates is often centralized or even politicized, which can hinder responsiveness to local needs. It is therefore imperative to establish participatory governance, actively involving residents in decision-making processes. Sustainable rehabilitation cannot be conceived without a thorough understanding of the needs, aspirations, and cultural practices of local communities. Integrating living heritage means recognizing and valuing the knowledge, traditions, and lifestyles of residents. This approach is consistent with the principles of the ecosystem approach, which emphasizes the importance of considering social, cultural, and environmental dimensions in the management of human ecosystems.

5. Conclusion

Equatorial Guinea, like most African countries, faces problems related to urbanization, and more specifically to housing. The latter is becoming dilapidated, and the social housing renovation projects undertaken and carried out in the city of Malabo remain insufficient, resulting in dissatisfaction among residents. The study conducted in the Los Ángeles and Barrio Chino neighborhoods revealed that the approach was not coordinated and that the solutions were limited to interventions that did not fully meet residents' expectations. In our view, this approach can be described as "remote rehabilitation," in that the solutions proposed remain insufficiently adapted to the needs and expectations of residents, take little account of local realities, involve the community concerned only to a limited extent, and rely heavily on the intervention of actors from outside the territory. The rehabilitation of social housing in Malabo requires an integrated approach, combining technical interventions, the provision of essential equipment and services, participatory governance, and the promotion of living heritage. This holistic strategy, rooted in local realities, is essential to ensuring the sustainability of projects and bringing about lasting improvements to residents' living environments and conditions.

Existing work on the subject allows us to make recommendations that, if taken into account, could bring about significant improvements in terms of operational planning and service delivery. Indeed, it would be advisable to clearly define the scope of the intervention, adopt an appropriate technical approach, integrate essential equipment and services, promote participatory governance, and promote living heritage and local practices. This holistic approach could help address the complex challenges posed by the physical deterioration of housing, the obsolescence of infrastructure, and the socio-cultural needs of residents. In addition, it could lead to increased resident satisfaction through improved perception.

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Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

References

[1] United Nations Department of Economic and Social Affairs Population Division, "World urbanization prospects: The 2022 revision. United Nations," 2022. https://population.un.org/wup

[2] United Nations Economic Commission for Africa (ECA), "Africa's urbanization trends and their implications. United Nations Economic Commission for Africa," 2017. https://www.uneca.org/publications

[3] M. Mouton, *Producing affordable housing in West Africa: States facing demand and local realities*. Métropolitiques, 2023.

[4] E. Bekinschtein, "Large social housing complexes: A dilemma to be resolved," *Cuestión Urbana*, vol. 3, no. 5, pp. 105-111, 2019.

[5] B. Villamil Bueno, "Sustainable design guide for VIS-VIP type housing projects in Bogotá: Case study: Pimientos de Madelena," Undergraduate Thesis. Universidad Piloto de Colombia, Bogotá, Colombia, 2021.

[6] E. Adoua Affoua Krah, "The degradation of social housing as a consequence of maintenance policies by property managers in Abidjan: The case of the Sogefiha Condominiums in Abobo and Sicogi in Adjame," *European Scientific Journal*, vol. 17, no. 23, 2021. https://doi.org/10.19044/esj.2021.v17n23p177

[7] H. Boutabba, M. Mili, and S. D. Boutabba, "Collective housing: What savings for public operators? Case study of the segment: Public rental housing (LPL)," *Revue d'économie régionale & urbaine*, vol. 12, no. 1, pp. 624–639, 2019.

[8] A. N'goran, M. Fofana, and F. Akindès, "Redeploying the State through the market: Social housing policy in Ivory Coast," *Critique Internationale*, vol. 89, no. 4, pp. 75-93, 2020.

[9] A. Abed, B. Obeidat, and I. Gharaibeh, "The impact of socio-cultural factors on the transformation of house layout: A case of public housing-Zebdeh-Farkouh, in Jordan," *Journal of Asian Architecture and Building Engineering*, vol. 22, no. 3, pp. 1195-1208, 2023. https://doi.org/10.1080/13467581.2022.2074021

[10] N. Mouaziz-Bouchentouf, "Social housing in Oran: Design, uses and preliminary evaluation," *Revue Géographique de l'Est*, vol. 54, no. 3-4, 2014. https://doi.org/10.4000/rge.5312

[11] F. X. Casanovas Boixereu, "Urban regeneration using the RehabiMed method: Procedure and case analysis," in *Actes du colloque international REHABATI: réhabilitation et revalorisation du patrimoine Bâti: les 23 et 24 Mai 2011 à Skikda (pp. 23-45). Éditions RECHERCHES et IPRAHUS*, 2011.

[12] A. Courbebaisse and N. Issot, "Large housing complexes: How to reconcile rehabilitation and heritage preservation. In Situ Revue des patrimoines," 2022. https://doi.org/10.4000/insitu.34440

[13] L. Thuvander, P. Femenías, K. Mjörnell, and P. Meiling, "Unveiling the process of sustainable renovation," *Sustainability*, vol. 4, no. 6, pp. 1188-1213, 2012. https://doi.org/10.3390/su4061188

[14] S. M. Zolfaghari, O. Pons, and J. Nikolic, "Sustainability assessment model for mass housing's interior rehabilitation and its validation to Ekbatan, Iran," *Journal of Building Engineering*, vol. 65, p. 105685, 2023. https://doi.org/10.1016/j.jobe.2022.105685

[15] J. Rieucau, "Bioko (Equatorial Guinea): A strategic island space in the center of the Gulf of Guinea," *Les Cahiers d'Outre-Mer. Revue de géographie de Bordeaux*, vol. 57, no. 226-227, pp. 217-232, 2004.

[16] National Institute of Statistics (Equatorial Guinea), *General population and housing census (RGPH) 2015: Population of towns and municipalities [Census results]*. Malabo, Equatorial Guinea: Government of Equatorial Guinea, 2015.

[17] A. Behloul, "Large urban housing complexes: an attempt at rehabilitation. A study of two cases in Algiers: Cité Diar El Mahçoul (El-Madania) and 08 Mai 1945 (Bab-Ezzouar)," Master's Thesis, Specialization in Urban Planning. University of Science and Technology Houari Boumediene (USTHB), Algiers, Algeria, 2008.

[18] L. Benabadji and M. Bencherif, "The rehabilitation of OPGI housing across the Wilaya of Tlemcen: The case of the 224-unit housing complex in Nedroma," 2012. https://www.researchgate.net/publication/366702023

[19] A. Calvano, A. Canducci, and A. Rufini, "Urban regeneration of public housing settlements, in Rome: The case study of San Basilio district," *Renewable Energy and Environmental Sustainability*, vol. 8, p. 15, 2023. https://doi.org/10.1051/rees/2023012

[20] C. Devaux, "Participatory housing: Towards the advent of sustainable housing?," *Sciences de la société*, vol. 98, pp. 94-109, 2016.