Landscape Architecture and Regional Planning
2025, Vol. 10, No. 2, pp. 36-57
https://doi.org/10.11648/j.larp.20251002.12

Research Article

Informal Housing and Socioenvironmental Conditions in Sub-Saharan Africa Urban Slums: A Case Study of Bonaberi, Cameroon

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Abstract

Rapid urbanization and climate change are intensifying the proliferation of informal settlements with dire socio-environmental consequences in Sub-Saharan African cities. Bonaberi, a densely populated area of Douala, Cameroon, exemplifies this, facing poor living conditions, limited services, and environmental degradation driven by population growth, poverty, lack of affordable housing options, and potential failures in government policies. While research acknowledges Sub-Saharan Africa's informal housing crisis, detailed investigations into the specific nexus of housing characteristics and socio-environmental conditions within individual settlements are lacking. There's a gap in understanding how particular housing features directly shape residents' daily lives and environmental challenges in contexts like Bonaberi. This study examines informal housing and its associated socio-environmental conditions in Bonaberi, Douala, Cameroon. It specifically characterize informal housing typologies, assessing residents' socio-economic circumstances and environmental challenges and their perceived impacts on inhabitants' well-being to proffer better management measures for sustainable urban development. A mixed-methods approach was used. 380 household head questionnaires were randomly administered to households' heads across eight (08) Bonaberi settlements. Fieldwork involved observations and measurements of housing, room and drainage conditions (determined by the size, depth, materials, and sanitation and waste disposal methods) and later compared to the recommended United Nation standards. The Geographic Information System (GIS) was used to ascertain the extent of slums conditions in Bonaberi. Key informant interviews with community leaders and authorities provided qualitative data in addition to a review of the related literature. The data were analysed using the Statistical Package for Social Sciences and presented using tables and figures. Results revealed that informal housing is predominantly rudimentary, dilapidated, and substandard, linked to acute poverty and high living costs. Shared pit latrines are common and poorly maintained. Open dumping of waste is widespread resulting to poor drainage systems. Overcrowding and unemployment compound these issues, despite potential upgrading opportunities. The study provides an empirical account of risky informal housing and degraded socio-environmental conditions in Bonaberi's slums, highlighting the urgent need for intervention. Participatory upgrading programs are recommended to deliver adequate housing and essential amenities. Improved access to credit, context-specific policies, community engagement, and public-private investment are crucial for sustainable, inclusive settlements. This study emphasizes a participatory upgrading for sustainable slum management in informal settlements facing housing and socio-environmental vulnerabilities in rapidly urbanizing SSA cities.

Keywords

Informal Housing, Slums, Socio-Environmental Conditions, SSA, Urban Development, Bonaberi, Cameroon

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Received: 19 April 2025; **Accepted:** 6 May 2025; **Published:** 13 September 2025

1. Introduction

The burgeoning global expansion of informal settlements constitutes a critical and intensifying concern for urban policymakers and stakeholders in the 21st Century [1, 2], with profound implications for sustainable urban development and social equity. Drawing upon recent international assessments, informal settlements and impoverished urban areas persist as significant impediments to global sustainable development, profoundly affecting the well-being of billions worldwide [3]. People who live in informal settlements are often systematically excluded from opportunities, decent employment, security, capacity, and empowerment [4] that would enable them to gain better control over their environment, health and lives. These informal settlements are typically marked by deficits in adequate housing, constrained access to essential infrastructure, heightened susceptibility to the adverse effects of climate change, and often function as epicenters of socio-economic disparities, disease prevalence, concentrated poverty, and social instability [5]. [6] using the context of America compellingly argues that poverty fundamentally undermines human potential, representing a societal failing that contradicts any assertions of national achievement. This assertion resonates strongly with the lived realities of individuals residing in slum conditions of many developing countries. [5] estimated that a considerable number of children from developing countries, ranging from 350 to 500 million lives in slums and experience limited access to healthcare, and sanitation or faced significant elevated risk of mortality before the age of five compared to their more affluent counterparts.

Recognizing the urgency of this global challenge, the international community increasingly advocates for comprehensive and integrated strategies that transcend mere physical infrastructure improvements. These approaches aim to address the fundamental drivers of urban poverty through fostering inclusive economic growth, ensuring secure tenure, promoting participatory urban planning, and guaranteeing the provision of essential services within a framework that respects human rights and aligns with the Sustainable Development Goals. This imperative is exemplified by initiatives such as the North West Ambulance Service (NHS) commitment to a substantial reduction (51% from the 1990 baseline) in carbon emissions [7]. Moreover, [5] underscores the importance of prioritizing the reduction of urban marginalization and dismantling barriers to access, particularly through equitable public resource allocation and the establishment of national urban land-use planning standards that explicitly consider the environmental health needs of slum residents.

Informal settlements are areas of sub-standard and inadequate provision of public facilities, inhabited by poor people living in high densities and squalors, who have developed a distinctive culture as a means of survival and self-respect [8-10]. [11] generally defined slum as a highly populated urban area that has no infrastructure for human habitation and is densely packed with dwelling units constructed with weak materials of poor quality. [12] diverted from these and defined slum as "a contiguous settlement where the inhabitants are characterized as having inadequate housing and basic services" such improved water and sanitation, sufficient living space, durability of housing, and security of tenure [13, 14]. Slums are not just the manifestation of population explosion, demographic change, or globalization, they so result from the failures of housing policies, laws, and delivery systems, urban policies and institutional and legal frameworks [15]. In the face of these challenges, with the help of local and national government, municipal and humanitarian agencies, the City Alliance coordinated by the World Bank and UN-Habitat have pooled resources, laws and policies to upgrade slums and ensure basic services accessibility to slum dwellers for an inclusive and sustainable city [16]. This includes efforts to meet the target to halve the proportion of people without access to basic sanitation services by 2030 [17, 18]. According to [19], this initiative could enable millions of children to attend school and increase some countries GDP by more than 10% if there are provisions for land tenure, expanding microloans and supporting low-cost housing start-ups. For instance, through collaborative work with the Mexico City government facing one of the world slums challenges, the Transportation and Development Policy (ITDP) successfully implemented a public bike-share program, a rapid transit bus system (Metrobus), and parking reforms. Their study, 'Less Parking, More City,' revealed the disproportionate investment in private vehicle infrastructure, highlighting that resources allocated to over 250,000 parking spaces could have instead funded extensive public transit capable of moving millions daily, thereby increasing productivity and accessibility. Against this note that [20] noted Habitat for Humanity has become good at persuading Third World Countries governments to provide the small sum that will help slum dwellers improve their homes with such things as doors and toilets either through investment or partnership with other urban actors.

While informal settlements differ in size and characteristics, their residents lack durable housing, sufficient living space, access to reliable services, secure tenure, and protection due to inefficient policies, political will, funding, and community participation [20, 17] exposing residents to deprivations, disease and environmental hazards, like toxic chemicals and air, water and soil pollutants. The living conditions in slums are usually unhygienic and contrary to all norms of planning and vulnerable to all forms of risks [17]. Slum residences, therefore, vary from shanty houses to professionally built dwellings, which, because of poor quality construction, land tenure, repairs and socio-economic forces, have deteriorated, have poor ventilation, acute overcrowding, faulty alignment of streets, inadequate lighting, paucity of

safe drinking water, logging during rains, absence of toilet facilities, and lack of basic physical and social services [22, 17]. According to [23] 51% of slums are based on invasion of private land in SSA, 39% in North Africa and West Asia, 10% in South Asia, 40% in East Asia, and 40% in Latin America.

Although, slums have existed in many periods and places, they have recently become targets for government and humanitarian intervention through renewal and social regulation as the famous Paris slum clearance scheme in the early 19th and 20th centuries [10]. Slum clearance is therefore necessary for the achievement of SDGs on inclusive and sustainable cities. However, in SSA these could only depend on how cities respond to their growth through improvements in governance structure and policies, institutional capacities, finance and engagement of the citizens to developed needed infrastructure and services [24-26]. This will have a profound impact on future sustainability, livability, and ecofriendly cities [27, 21]. Without a holistic collaboration between actors, investment, infrastructural development and citizen participation, the influx of informal settlers will continue, as will their exposure to risks associated with unmanaged urbanization. With an additional 560 million people expected to move into SSA cities by 2040, this issue cannot be ignored [16].

Unfortunately, since 2003, an estimated one billion people inhabited urban slums majority women from rural areas. Today, nearly 1.1 billion people live in slums and other informal settlements around the world [19]. According to [28], this is almost one-third of the world's urban population. This could increase to 1.2 billion in 2030 [2, 29] and to approximately 3 billion by 2050, just from 2 billion in 2020 alone [9]. Among the over one billion people who live in informal settlements today, one-third of households are headed by women. Over 75% of this population is expected to live in informal settlements of developing countries [30, 9]. The reality that over 60% of Africa's urban population lives in informal settlements cannot be denied, nor can it be denied that a country's population is its best asset [31]. In SSA, informal urbanism (50% to 70%) [32] have emerged along with formal city growth to cater to the influx of rural-urban migrants and displaced citizens facing huge disparity in income, food insecurity and hunger, limited service provision including water and sanitation and electricity [33]. The scale and speed of this phenomenon pose serious and compelling risks and challenges to socioeconomic wellbeing and health conditions of residents—in sum, it is a crisis of unprecedented magnitude. This has intensified pressure on resources of cities and stakeholders. For instance, [34] noted that in Uganda, excess water lays dormant near unplanned settlements resulting to water pollution and diseases and the proportion of people who practice open defecation is estimated to be 9.4% in urban areas [35] due to limited sanitation services especially in slums. There is the need for infrastructure provisions in SSA where more than 300 million people are slum dwellers [36]. In Nairobi, where 60% of the city's population lives in slums, child mortality in the slums is 2.5 times greater than in other areas of the city [30].

According to [37], with the 1.4 billion population boom expected by 2063 from just 55% in 2014 [38], informal settlements and climate-based issues must be addressed, lest half the population of Africa be lost due to lack of foresight. Hence, effective infrastructure can mitigate disease and health issues related to climate change in informal settlements. Unfortunately, with current trends, the growth rate of these areas substantially exceeds attempts at "urban upgrading" government investment of basic needs of these communities coupled with the risk involved in decentralization which has cause political divide in countries like Uganda, Nigeria and Kenya as well as weaken opposition by imposing new costs on the state and local government authorities. This includes building costs related with establishing new assemblies and political meeting places rather than community development [39].

In Cameroon, slums development is a major issue of concern in major cities like Douala and Yaoundé, characterized by acute poverty and failed government policies to solve the challenges of population explosion that have brought further hardship, risk and vulnerability to the urban poor in terms of food insecurity, poverty, high cost of living, flooding among others [27, 39]. Specifically, Douala is home to an estimated 1.2 million slum dwellers out it estimated 4 million inhabitants, who live in overcrowded and unsanitary condition with limited access to basic services like food, water, shelter and energy despite stakeholders' strive. Slum dwellers continue to face insecure employment, live in state persecution, eviction, extreme poverty, and vulnerabilities [40, 39]. Thus, slums regeneration efforts in Douala are complex due to acute mismanagement, rapid urbanization, increase housing demands, weak policies, limited participation, funding, trust, and weak institutional mandates. Without active intervention and renewal slums policies integrated with other strategies, rapid urbanization could exacerbate what is already a human disaster as slums life continues. This is event in Bonaberi where about 70% of its residents continue to live in slum [21, 39]. Owing to these challenges, a number of initiatives have been put in place to reduce the growth of slums: slum clearance, upgrading, land tenure reforms and urban planning. However, despite stakeholders and residents efforts, slums have continued to be registered and the conditions of slum dwellers have continued to deteriorate resulting to high socio-economic and health risks. There are high-density residential units owing to human numbers and urban poverty that have resulted in acute overcrowding and old dilapidated buildings, with the worst environment.

Informal housing is continuously built with very old and ruin materials, with little or no airspace, owing to a lack of planning. If the development of slum continues to go unabated, the conditions of rapid urbanization and climate change will continue to cause suffering and risks to the residents. Although, slums are associated with causes, delineations, manifestations, implication, management options and prospects,

this study focused more on the nexus between slum conditions, delineation and socioeconomic consequences in order to proffer management options by stakeholders to ensure better livable, equitable, inclusive and integrated urban settlement.

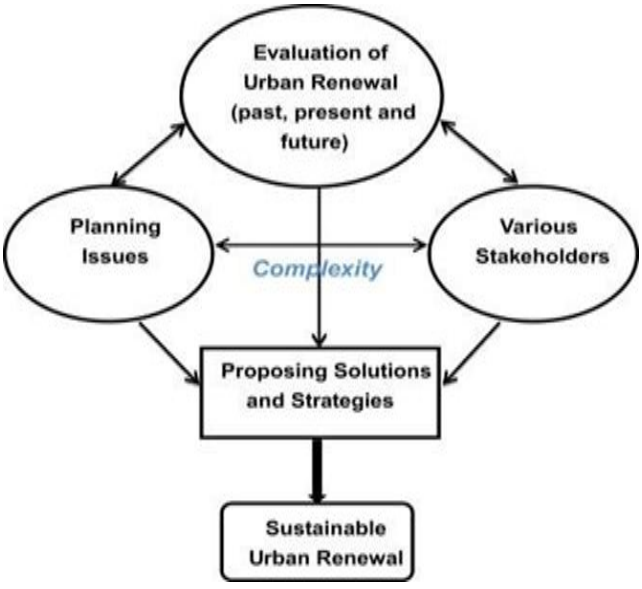
Various theories have been postulated to find out the reasons and identify the grounds for informal settlement and prevailing socioeconomic conditions. The phenomenon of informal settlement has been studied from different viewpoints such as social characteristics, urban ecology, land utilization, shortage of housing, land price and others. Kimberl é Crenshaw, has highlighted how various social categories such as race, ethnicity, gender, class, age, disability, and geographic location (like living in an informal settlement) interact and create overlapping and interdependent systems of discrimination or disadvantage. The Sustainable Development Theory emphasizes meeting the needs of the present without compromising the ability of future generations to meet their own needs characterizing how the current state of informal housing, socio-economic conditions, and environmental challenges directly contributes to making urban development more sustainable and equitable in the long run. The capability theory by Amartya Sen and Martha Nussbaum which focuses on expanding people's capabilities and freedoms to live lives they have recently shown how informal housing and environmental challenges often severely limit people's capabilities in terms of health, safety, education, and overall quality of life. Marshal Clinyard has viewed the informal settlement and socioeconomic conditions from an ecological aspect and considered the stages of urban growth as the result of its economic role and the main cause for separation of ethnic groups and development of slums. Hemomer Hoit has presented the theory of sectional form of his city based on the said view accordingly. Rovenstine and Ortlee believe that the main cause of immigration from one place to another is the positive elements of destination and negative elements in the origin that cause immigration. Most of suburbanites are the migrants who have been attracted to the city of destination due to positive elements. Todaro also defines the economic motives of migrants and expected income in cities is main causes of immigration. From another viewpoint, informal settlement is the consequence of general problems of the global system and has emerged due to specific conditions.

Understanding these macro-level forces can provide a broader context for interpreting the local conditions in Bonaberi. However, what has occurred in most of the countries of the third world is not only the result of international work division but it is also the consequence of their unbalanced political, social and economic systems. Hence, this study stressed the need to involve the local community as outlined by the Participatory Development Theory which emphasizes the importance of involving local communities through public private partnership in the development process to ensure their relevance and effectiveness in sustainable urban development.

It is therefore on the bases of these theories that this spatial explicit investigation of the nexus between informal housing typologies and prevailing socio-environmental vulnerabilities in Bonaberi will offer critical empirical data for informing context-sensitive urban upgrading policies and sustainable development strategies in SSA. It will also be used to offer a theoretical understanding of the evolution of informal settlements and the development of effective framework that can be leverage by urban actors to improve urban resilience and public health in rapidly urbanizing SSA cities.

2. Conceptual Framework

This study adopted the concept of urban renewal as an operational framework involving planned efforts to revitalized underdeveloped areas to guarantee a safe and healthy environment for slum dwellers in Bonaberi. Urban renewal in the context of slum regeneration refers to a way to improve the living conditions of people living in slums through the provision of access to facilities and services, including education and training, to residents on how to improve their homes and communities. These programs address the physical aspects of urban decay, including water and sanitation services [24, 41]. It is an alternative to the unpopular policy of "slum clearance" involving demolishing decaying housing and slum areas and relocating families to safer environments through the provision of new housing units or by providing financial assistance to residents to help them move to better housing) and preventing slum formation (causes) through the provision of job, improvement in access to services and strengthening government institutions [42]. Urban renewal creates opportunities for higher-class housing and restores economic viability by attracting external private and public investment and boosting business start-ups and survival [43].

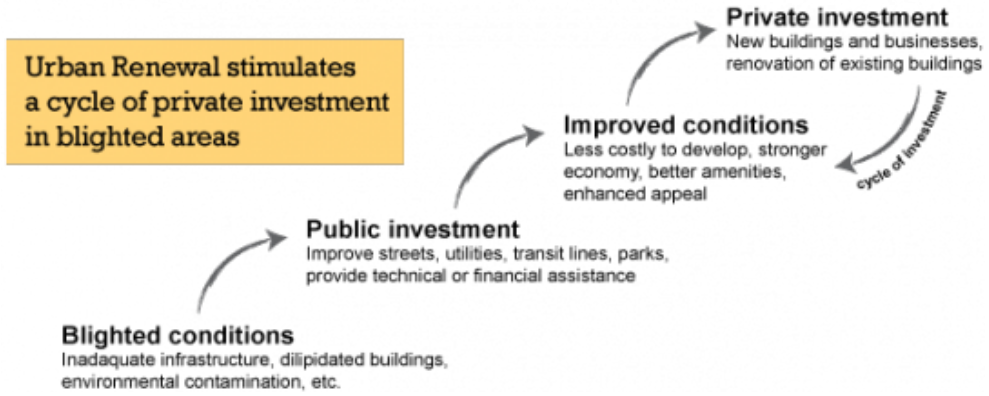


Source: Adapted from [38]

Figure 1. *Concept of Urban Renewal.*

Urban Renewal is used by urban planners as a revitalizing tool for "blight" through public investments that stimulate private development in areas characterized by unsafe buildings that are unfit for occupancy, inadequate streets, or environmentally contaminated areas. Private real estate developers, property owners, or business owners are able to generate sufficient profit for potential development. Where private investment stalls and blighted conditions remain, public investment is sometimes necessary to support private investment, which could improve infrastructure and provide technical and financial assistance to augment community social amenities. Once private development becomes economically practical, investment returns on the area (Figure 1).

As physical and economic conditions improve over time, further private investment is stimulated and the local economy is strengthened. The economic vitality, livability, and environmental sustainability of a wider city are often improved through Urban Renewal investments. Urban Renewal works because it stimulates a cycle of private investment by removing the blighted conditions that act as barriers to new development (Figure 2).



Source: Adapted from [44]

Figure 2. *Public and Private Investment in Abetting Urban Renewal.*

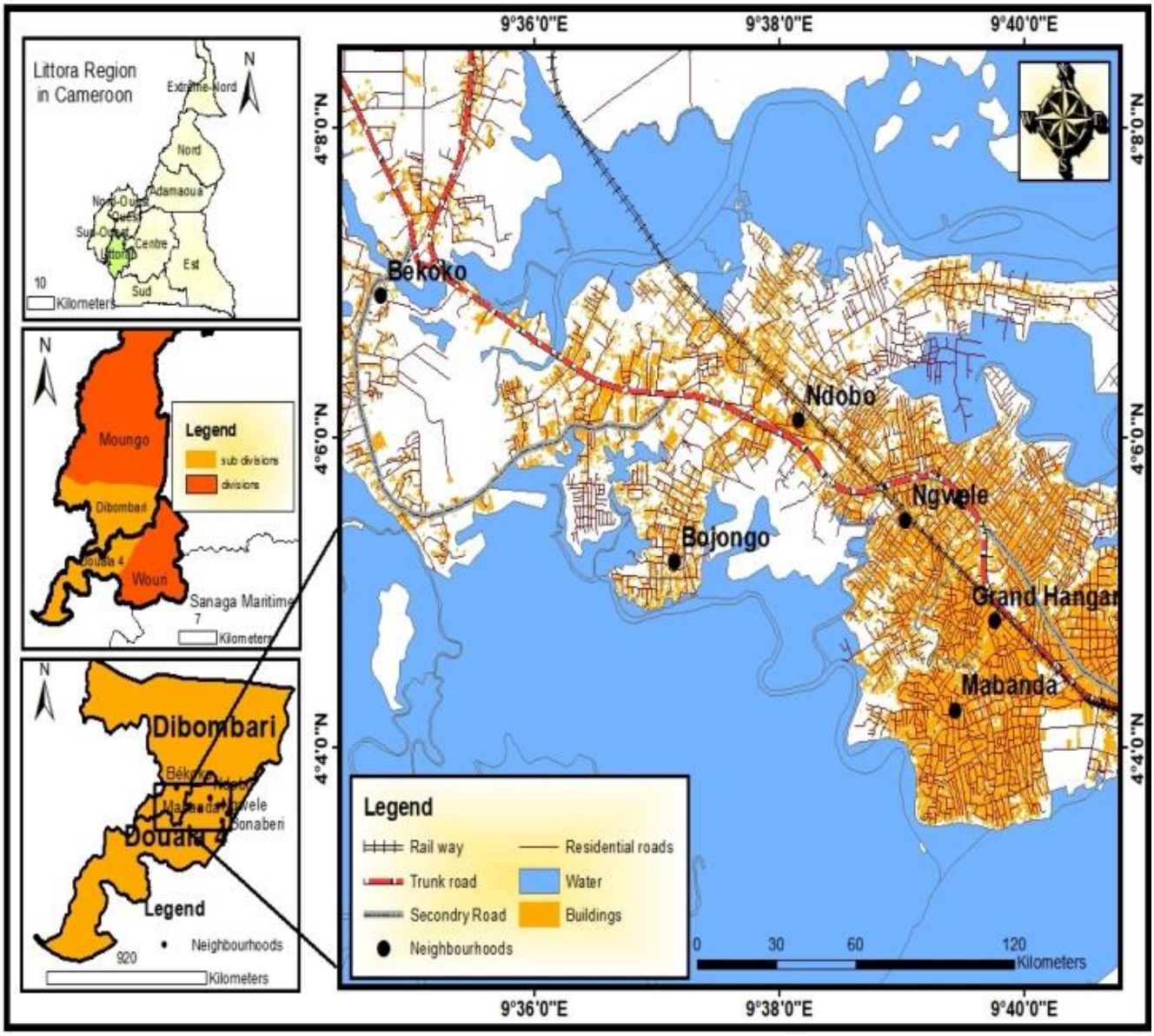
Urban renewal can help improve the living conditions of people living in slums by providing them access to better housing, infrastructure, and services. This can lead to a number of benefits such as improved health, safety, and economic opportunities and jobs, resulting in a more stable and prosperous community [45]. Finally, through urban renewal strategies, city stakeholders can help increase social cohesion by bringing people together and creating a sense of community that could ensure that solutions are tailored to the needs of the community and that the community is supportive of the efforts.

This could lead to a more vibrant and livable city. In addition, financial requirements could be necessary from government and international agencies or donors to facilitate the process of urban renewal in addition to coordination to ensure the effectiveness of program implementation. The slum issues in Bonaberi are complex because of the high cost of implementation, limited community participation, and political well without any easy solution. By adopting a comprehensive approach that involves the community, securing funding, and coordinating the efforts of different stakeholders, it is possible to improve slum conditions [44]. This could involve community participation, tailoring their participation to the national and global strategies, managing risk and ensuring financially sustainability. Characterized by inadequate infrastructure, poor housing quality, and environmental degradation, Bonaberi's informal settlements are prime candidates for targeted urban renewal initiatives by stakeholders. However, the scale and complexity of these challenges necessitate a strategic combination of public and private investments in infrastructure and innovations to achieve meaningful and sustainable urban transformation in addition to slum infrastructure upgrading, improved housing quality using local materials and local participation and empowerment.

3. Study Area

Bonaberi is located between Latitudes 4.0234 °and 4.0321 ° north of the Equator and Longitudes 9.7455 °and 9.7532 °east of the Greenwich Meridian (Figure 3). It has a total surface area of 21,000 ha and population density of 145 persons/km^2 [31, 46]. While the annual rainfall is more than 4000 mm, temperatures range between 24 ℃ and 27 ℃ [32, 47]. The population of the eight (08) selected neighbourhoods (Ndobo, Mabanda, Grand Hanger, Sodiko, Ngwelle, Bojongo, Bekoko, and Centre Equestre), which make up the study area, were estimated to be 108,000 persons, which was obtained from the digitized imagery that places the total number of buildings in the eight housing quarters at 27,000. This figure was arrived at using the Douala City Council (DCC) postulation of four households per building and four persons per household. A

number of factors are associated with informal settlements in Bonaberi including poverty, population explosion, inadequate policies, and a lack of affordable housing.



Source: Adapted from the Administrative Unit Map of Cameroon (2022)

Figure 3. *Bonaberi in Douala IV Municipality of the Littoral Region of Cameroon.*

4. Data Collection and Analysis

The study purposively focused on eight (08) neighborhoods based on a reconnaissance survey to understand the conditions of slums and from the sampled opinions of household heads who lived in the area for over 10 years. The choice of these neighborhoods was justified by [36, 39] as prevalent areas of slum development. A sample size of 380 households, which amounted to 5% of the household population, was chosen randomly across Bonaberi for the questionnaire administration. The questions framed in the questionnaire were organized to obtain information about the features of buildings, ownership status, and access to services. The sample size is conceivable, considering the homogeneity of the slum settlements and residents of Bonaberi. A systematic random sampling technique was utilized to select respondents at every 4th residential building. Reconnaissance surveys were conducted to ascertain the number and quality of buildings and other facilities, which allowed this study to bridge the gap between what people say and what happens on the ground in the field. Google Earth imagery of Bonaberi was utilized and

digitized on ArcMap 10.6; the building population reached 27.000 buildings. The interview process consisted of interviewing one or two long-term, high-level employees of the selected housing authority who had been involved in setting and administering affordable housing and the urban renewal process for over 10 years. Considering DCC (2010) estimated household size of four people for each family and four families for every building, the estimated family population of the study was 23,965 households (4,793 buildings ×4 households per building = 23,965 households) [46]. Data codification and analyses were performed using the Statistical Packages for Social Scientists (SPSS Version 23.0) and are presented using tables and figures.

5. Results and Discussions

5.1. The Nexus Between Slum Conditions and Socio-Environmental Impacts

The complex relationship between slum conditions and socio-environmental impacts forms a critical nexus in urban development, particularly within rapidly growing SSA cities like Douala and its neighborhood, Bonaberi. Characterized by frequently lacking formal legal recognition and security of tenure, inadequate and often dilapidated housing, and limited access to essential services such as sanitation and clean water, and rudimentary waste management practices, slum environments create a context where human health and ecological integrity are deeply intertwined. These conditions not only compromise the well-being of residents through increased exposure to disease and environmental hazards but also contribute to broader urban environmental degradation. Understanding this nexus is fundamental for formulating effective and sustainable interventions aimed at improving the lives of slum dwellers and fostering healthier urban environments. This section therefore explores the slum conditions (ie legal status, types of buildings, age of buildings, material use in building construction, roofing materials, conditions of drainage system, and access to water sources, mode of refuge disposal and location of slums) as characteristics of slums with delineations and resultant socioenvironmental impacts in Bonaberi.

5.1.1. Legal Status of Buildings

The legal status of buildings in Bonaberi is governed by the Law N ° 2004/003 of April 21, 2004, governing urban planning in Cameroon, which sets out guideline requirements for obtaining a building permit. The Decree N ° 2007/146 of March 6, 2007 on the building permit outlined the documents that must be submitted to the local authorities, the Law N ° 2011/017 of December 22, 2011 on the management of land tenure in Cameroon sets out the general principles of land tenure, including the requirements for registering a property. Consequently, for any building to be considered legal it must be constructed in accordance with the zoning regulations and building codes have a valid building permit and should be registered with the land registry under the Delegation of the Ministry of Land Tenure and Security (MINCAF). If a building does not meet these requirements, it should be considered illegal and subject to demolition or other penalties by the municipal councils. Field evidence justifies that Bonaberi slum was well known with informality, judging by the fact that many of the buildings are aged and were erected before modern planning came into existence in the early 20th Century when the settlement was first colonized by the French. The first Master Plan for Douala was developed in 1914 by the French architect and urban planner, Albert Laprade. This plan was based on the principles of French colonial urban planning, which emphasized wide streets, open spaces, and grand public buildings. However, this plan was never fully implemented despite saving the basis for subsequent planning efforts in Bonaberi resulting to the proliferation of slum settlements thus corroborating [19] noted that due to a lack of urban planning, the absence of governmental oversight and a chronic lack of affordable housing, it's estimated that nearly 40% of housing developments in Freetown have been built in medium- or high-risk areas. In Bonaberi, the location of households in flood prone environment without tenure security and access to basic services such as clean water and sanitation systems. According to General Assembly, A/73/310 2018 residents of informal settlements often lack security of tenure or land rights, living under the constant threat of eviction [38].

Table 1. *Legal Status of Buildings.*

Legal Status	Stats	Yes	No	Total
Approval Permit	N	29	85	114
	%	25.4%	74.6%	100%
Zoning Regulation	N	24	71	95
	%	25.2%	74.8%	100%
Site Plan	N	16	53	69
	%	23.2%	76.8%	100%
Building Code	N	12	49	61
	%	19.7%	80.3%	100%
Location Plan	N	8	34	42
	%	19.1%	80.9%	100%
Total	380	89	291	380
	100	23.4%	76.6%	100

Source: Fieldwork, 2024

Form Table 1, none adherence to basic legal requirement considers the building of respondents in Bonaberi illegal often subjected to demolitions, sanctions or penalties. However majority of the respondent accorded the non-possession of these legal documents due to the long delay and administrative bottle neck, double dealing and long processing time of documents by the city officials despite the decentralization drive by the government to ensure effective service delivery and management. According to DCC, the fines paid for illegal building in Bonaberi varies depending on the severity of the infractions following the urban planning and zoning laws of Cameroon. For buildings that are not in compliance with the zoning regulations: A fine of up to 500,000 FCFA (approximately $830USD). For buildings that are not in compliance with the building codes: A fine of up to 1,000,000FCFA (approximately $1660 USD). For buildings that are constructed without a building permit: A fine of up to 2,000,000 FCFA (approximately $3320USD). This absence of legal standing and high cost of obtaining permits have a profound implications for the provision of basic services, infrastructure development, and the overall environmental health of these communities [48].

For buildings that are demolished by the authorities: The owner of the building may be required to pay the cost of demolition. Due to the limited financial status of residents, majority consider these sums very expensive and the procedure so difficult. In addition to fines, the owner of an illegal building may also be subject to other penalties, such as imprisonment. The penalties for illegal buildings are intended to deter people from constructing illegal buildings and to ensure that all buildings in Bonaberi comply with the zoning regulations and building codes. According to [49, 50] development of informal settlements in many urban centers of developing nations cannot be divorce from a high rate of poverty. Recent studies have linked poverty to the low level of compliance with planning requirement in developing countries [9]. Also in a study on water, sanitation and hygiene challenges in informal settlements in Kampala, Uganda, although informal settlements had many infrastructure "upgrades" such as latrines and toilets, water taps, wells, and garbage collection and drainage systems, the water, sanitation, and hygiene (WASH) system and its components largely failed due to point-of-use charges of water taps and toilets and the difficulty of emptying cesspits due to land tenure arrangements [48].

5.1.2. Type of Buildings

The type of building in Bonaberi varies depending on the location and quality. Table 2 revealed that the tenement housing also known as the Brazilian type (often having more than one story) was predominant in Bonaberi (45%); while the traditional, detached/semi-detached and blocks of flats also known as shacks and commercial buildings had 23.4%, 14.7% and 5.5% respondents rats respectively (Table 2).

Table 2. *Type of Buildings.*

Type of Buildings	Frequency	Percent (%)
Traditional	89	23.4
Tenement [Face-to-Face]	171	45
Detached/Semi-Detached	56	14.7
Commercial	21	5.5
Block of Flats	43	11.3
Total	380	100

Source: Fieldwork, 2024

They are typically made of blocks, wood, and corrugated metal. Shacks are often overcrowded and lack basic amenities, such as running water and electricity. It was observed that tenements buildings are typically made of concrete blocks and they may have some basic amenities (running water and electricity) even though majority is often highly overcrowded and usually in poor conditions with severe security concerns. There are also a number of commercial buildings in Bonaberi mostly located along nodes and junction areas for easy accessibility. These buildings are typically used as shops, restaurants due to their standard condition unlike residential buildings. However, they may still be overcrowded and lack basic amenities including fire extinguishers for protection during fire outbreak. In addition, informal settlements in Bonaberi often made up of makeshift shelters that are built on vacant land and floodplains exposing citizens to health risks, privacy, mental and psychological stress due to heat, ventilation and pollution caused by increases densities (Figure 4). In addition to poor community planning in Bonaberi, structurally unsound construction creates hazards for inhabitants, which are exacerbated in many unplanned settlements by floods, fires and landslides.

Source: Fieldwork, 2024

Figure 4. *Tenement (A) and Wood (B) Buildings at Mabanda Neighbourhood.*

5.1.3. Neighbouhoods, House and Room Densities

The high neighbourhood, house and room densities in Bonaberi are a result of the rapid urbanization of the settlement as majority of the immigrant fines safe haven in the area. Bonaberi is one of the fastest growing suburbs of Douala, and the population of the suburb has increased significantly in recent years. Bonaberi has experienced a significant population increase, rising from 250,626 inhabitants in 2005 to 561,001 in 2022 (DCC, 2023). This growth, coupled with the relatively small land area of 890 km², has led to increased neighbouhood, housing and room densities putting strain on facilities like public taps, hospitals, clinic and housing supply in Bonaberi. With an annual growth rate of approximately 4.85% [40], this growth is fueled by both natural increase and migration including the Anglophone crisis, attracting over 10,000 migrants and internally displaced persons annually, primarily young people from other regions of Cameroon and beyond. Bonaberi is one of Central Africa's fastest-growing settlements [51], with a population density of 532.1 people per square kilometer. This has led to the high house and room densities resulting to overcrowding, poor sanitation and the spread of diseases including limited privacy. High population density, allow diseases to spread quickly as evident during COVID 19. This creates a real risk for large populations who are often unable to access adequate healthcare facilities to get treatment in time. In addition, emergency services and law enforcement vehicles have difficulty navigating through dense unplanned settlements like Ndobo and Mabanda due to tightly woven pathways and few signs, resulting in difficulties monitoring and controlling crime and providing healthcare services. This has cause the rate of crime waves in Bonaberi to increase by 68% according to DCC.

Hence, overcrowding, no doubt influences slum development; observations made during the field survey revealed that buildings in Bonaberi accommodates more family households. For instance, in a single face-to-face building, between four to six households was observed with an average of eight rooms; the room is used for cooking, sleeping and living. This of course is one major characteristics of slum (overcrowding). This significantly affects the state of health of residents. [52-54] all noted that overcrowding in houses has detrimental effect on both mental and physical health. A 2018 study by [55] found that the average household size in Bonaberi is 7.5 people. This means that there is an average of 3.75 people per room in Bonaberi more than the international standards of between 1 and 3 people per room [4]. In neighbourhoods like Bekoko, Overcrowding is also seen near sources of drinking water, cleaning, and sanitation where one toilet may serve dozens of families.

5.1.4. Age of Buildings

One of the identifying characteristics of slums is not the lack of or inadequate public infrastructure but the age of infrastructure. It is a significant factor contributing to precarious socio-environmental conditions and the vulnerabilities of residents. Characterized by rapid urbanization, limited maintenance and a lag in formal housing provision, many slum dwellings are constructed informally, often with rudimentary materials and without adherence to building codes, leading to structures with limited lifespans and increasing deterioration over time due to fires, floods and illegal practices. Table 3 present the perceived lifespans of dwellings in Bonaberi.

Table 3. *Age of Buildings.*

Age of Buildings	Frequency	Percentage (%)
< 25 years	34	8.9
25-50 years	76	20
51-75 years	137	36.0
76-100 years	119	31.3
>100 years	14	3.7
Total	380	100

Source: Fieldwork, 2024

Table 3 shows that the mean age of the buildings was discovered to be 78 years; this is a clear indication that houses in Bonaberi had been in existence for a very long time. [11, 15] noted that favelas in Sao Paolo, unlike in Rio de Janeiro are recent phenomenon, less than 50 years old and whose current shape and growth date back to 1980. Their appearances are associated with peripheral patterns of urbanization resulting from the end of interrupted economic growth since 1950s. This cannot be unconnected with the fact that earlier settlers of Bonaberi settled, while those buildings constructed then are still in existence but now in a poor condition due to the old building construction materials used as well as exposure to

elements of environmental change including floods, landslides intense sun, heavy rains, humidity. Agreeing with this [56] noted it is of no doubt that houses constructed in recent times tend to be more habitable than those built much earlier and this reflect the trends of house rental in Bonaberi. Tenants prefer recently constructed homes for conveniences and safety. In neighbourhood like Mabanda, the lack of connection to formal drainage, sanitation, and water systems becomes increasingly problematic resulting to health risk and accidences especially during rains.

Bonaberis', aesthetic is lost as old buildings from time past lack the aesthetic value and were seen to be in a poor condition therefore very difficult to compare it with other parts of Douala. Having this group of substandard buildings to be more in this area characterized and degenerate the environment into slum. As a result of building materials, shacks are often relatively young, as they are more likely to be replaced than tenements especially at the peri-urban settlements due to urban growth.

5.1.5. Location of Kitchen and Washing Sites

The spatial organization of domestic activities within Bonaberi's slums, as evidenced by the prevalence of outdoor kitchens and washing sites for clothes and personal hygiene (63.4%), reflects the constraints of limited space, lack of indoor plumbing and dedicated space and economic hardship. This finding aligns with broader trends observed in informal settlements across sub Saharan African cities, where space scarcity often dictates the placement of essential household functions outside the main dwellings. The location of these facilities in Bonaberi slums varies depending on house size, income, space, safety concerns and locations. However, the general trends observed, revealed that most of the residents' kitchens and washing sites (63.4%) were located outside the living space/area due to limited space and cost of renting separate kitchen. These kitchen are detached, constructed separately while the washing sites is almost practice everywhere there is space within the household. In over 55% of homes residents practice the habit of taking their bath in the night due to modesty.

For the 36.6% of the respondents, cooking fires can be a fire hazard, and it is often unsafe to have them in the same room as the living area. In Ngwelle and Sodiko Neighbourhoods, kitchens are located in separate rooms. High income dwellers with more space have their kitchen separated from the living room for accessibility and privacy. Figure 5 illustrate kitchen and washing sites located outside the building. From Figure 5, residents mostly used firewood to prepare their meals outside the kitchen. The absence of dedicated and hygienic washing areas, often leading to washing activities near open drains or communal water sources, can contribute to water contamination. Wastewater from washing, containing detergents and potential pathogens, may flow directly into the environment, further polluting scarce water resources and exacerbating sanitation problems. Consequently, the exposure to firewood smoke and contaminated water leads to respiratory diseases, water borne diseases affecting human health. In addition, this causes safety and security issues particularly to women [57]. Also, food prepared in the open where flies, domestic animals, rodents, reptiles and filth are present may result in diarrhea and other forms of gastro-enteritic disorders in urban slums [58]. Sanitation services are particularly lacking in informal settlements which house over 60% of the urban population [59].

Source: Fieldwork, 2024

Figure 5. *Cooking and cleaning locations in Mabanda: Noticed a woman washing clothes in a small bowl outside the main building.*

5.1.6. Type of Toilet Facilities

The types of toilet facilities in Bonaberi vary depending on the individual household even though some general trends that can be observed. Analysis as shown in Table 4 revealed pit latrines are the most common in Bonaberi often constructed with bricks with hole in the ground that leads to a pit as represented by 51.9% of respondents. A significant majority of these toilets are located outside the building and are of

poor hygienic condition with health risk due to their proximal location to wells. Pit latrines are relatively inexpensive to build and maintain. Poorly kept shared pit toilet facility is a breeding ground for diseases vectors and an avenue for transmission of infectious diseases [60, 58].

Table 4. *Type of Toilet Facility.*

Toilet Type	Frequency	Percentage (%)
Pit Latrine	197	51.9
Water Closet	102	26.9
Open Defecation	53	13.9
Communal toilets	28	7.3
Total	380	100

Source: Fieldwork, 2024

Figure 6 illustrate a pit latrine with modern squat-bowl at Mabanda Neighourhood. Some households use buckets as a substitute to pit latrines in Sodiko Neighbourhood. The use water closet toilets are limited for very few high income residents due to their expensive nature and high water demands. It is use it collect waste and then disposed in public spaces, nearby drains or water ways usually less expensive for low income households with high unsanitary and risks implications. Communal toilets in Bonaberi are located in hospitals and markets usually paid and with little or no privacy. Sometimes it's difficult to separate the female unit from the males. Open defecation is in the open fields, roadsides is a living reality for most low income dwellers. This is more especially in cases in which toilets were too dirty to tolerate. Residents interviewed also reported using other means such as buckets or polythene bags which they would then throw onto roofs or dump in the drainage canals. Although with a least sanitary type of toilet facility, it usually poses a serious health risk.

5.1.7. Building Construction Materials

The choice of building materials use in Bonaberi was often influenced by the availability, cost and the desired aesthetics. Cements was the most building materials used as indicated by 61.8% of respondents while 29.1% was constructed with woods, 8.9% were constructed with corrugated metals. Although, readily available cement materials were very expensive, corrugated metals are durable, resistant, expensive and lightweight, but scarce due to competition from the electrical companies. They also posed serious environmental challenges including noise pollution during heavy rains or winds which can generate massive fire hazards.

Source: Fieldwork, 2024

Figure 6. *Pit Latrines exposed to wear and tear and pi latrine with Modern Squat-Bowl at Bekoko Neighbourhood.*

Table 5. *Building Construction Materials.*

Wall Material	Frequency	Percentage (%)
Woods	111	29.3
Cement Block	235	61.8
Corrugated metals	34	8.9
Total	380	100

Source: Fieldwork, 2024

However, some woods are not a very durable material, and it is susceptible to damage from water and pests due to high or low humidity. This clearly characterized the environment as slum in rapidly urbanizing slum settlements of Bonaberi. As a matter of fact, some of these buildings constructed with woods were not plastered with concrete; which is subject to wear and tear. Concrete blocks are a strong and durable material that is often used to construct foundations and walls although relatively expensive. This housing material also established the fact that the buildings had been constructed many years ago despite the current level of building technology. Majority of buildings are dilapidated and falling apart due to wear and tear resulting to significant health risks. [61] opined a correlation between age of housing and residents health condition.

5.1.8. Roofing Materials

There are diverse roofing materials in Bonaberi depending on coast and accessibility for slum dwellers. Table 6 revealed corrugated iron sheet to be the prevalent roofing material used for the buildings as revealed by over 70% of the sampled respondents. Unfortunately, corrugated iron sheet when exposed to climatic conditions over time leads to rusting which changes the colour of the roof and subsequently becomes dilapidated or prone to fire hazard. Results revealed that a majority of these roofing sheets are dilapidated, flapping and leaking (Figure 7). Asbestos sheets were once a common roofing material in Bonaberi, but they are no longer used due to their health risks.

Table 6. *Roofing Materials Used for the Buildings.*

Roof Types	Frequency	Percentage (%)
Corrugated Iron Sheet	259	71.9
Aluminum Sheet	82	22.7
Asbestos sheets	19	5.2
Total	360	100

Source: Fieldwork, 2024

5.1.9. Characteristics of Drainage

The conditions of drains in Bonaberi vary depending on the type of construction material. Approximately, 65% of the respondents noted the use of carved stones and sand, 25% noted the use of sand; rods and gravel, while 10% of respondents noted that there were just shaped and channeled without constructed. Table 7 revealed the 76.6% of respondents agreed to have a free-flowing drainage beside the road leading to their homes, 10% had theirs blocked 3.4% experienced a water logged drainage while 10% do not have a drainage system at all. Similar studies by [12] noted that an estimated 5 million people in England and Wales live and work in properties that are at risk of flooding from rivers or the sea and around 2 million people are at risk from pluvial flooding, which represents around a third of all flood risk in the United Kingdom (UK).

Source: Fieldwork, 2024

Figure 7. *Dilapidated Corrugated Sheet for Building at Grand Hanger and Mabanda Neighbourhoods.*

Table 7. *Perceived Drainage Conditions in the Study Area.*

Condition of Drainage	Frequency	Percentage (%)
Free flow	268	76.6
Blocked	35	10
Water logged	12	3.4
No drainage	35	10
Total	350	100

Source: Fieldwork, 2024

Population change and poor urban design have the potentials to put three times more people at risk than climate change. The conditions of drains in Bonaberi are often poor and in most cases clogged with debris, garbage, and they can be overflowing with sewage resulting to health risk due to stagnant water clogged which provides breeding ground for mosquitos (Figure 8). Lower income groups and renters are slightly more exposed to pluvial flood risk because of the number that live in low lying areas around Bonaberi dominated by higher density terraced housing and flats. Flood risks are also common leading to damage to properties notwithstanding odor resulting to nuisance, health risk and nasty environmental which discourage visitors into particular neighbourhoods. During severe flooding residents take refuge in public spaces (churches and public schools).

Source: Fieldwork, 2024

Figure 8. *(A) Water logged drainage at Grand Hangar (B) Flooded Street at Sodiko Neighbourhood.*

Table 8. *Characteristics of slum drainage channels.*

Location	Depth (cm)	Width (cm)	General characteristics
Bojongo	78	73	Contained silt and plastics and most portions blocked
Centre Equestre	20	25	Completely blocked and waterlogged
Grand Hanger	91.6	71.9	Very clear and good in conveying runoff
Sodiko	91	80	Widely open but silts and plastics accumulating within
Ndobo	43	59	Greater damaged and blocked. Highly malfunctioning
Mabanda	109	135	Widely open and good in conveying runoff
Bekoko	99	80	Well-constructed but exposed to wear and tear
Total	*531.6*	*523.9*	
Range	89	110	
Average	*75.94*	*74.8*	
UN Width Standard	*120m*		
UN Depth standard	*130cm*		

Source: [4]; Fieldwork, 2024

This is due to the fact that some of the residents engage in depositing their waste into the drainages during this period. Which possess significant health and environmental risk (odour, diseases, crimes and inaccessibility). Consequently, poor drainage system breeds mosquitoes which are the causative organism for malaria or result to fatal accidents as drivers and motor bikes punched into them. The depositions of urine into the drainages also contribute to the foul smell emitted from these drainages, thus making it look unattractive. Table 8 revealed that about 75% of the drainage channels have been influenced and they are actually malfunctioning due to extreme flooding. Flooding seriously undermine the mental health of communities that are impacted or those that fear they may be in the future and affects the most vulnerable groups such in our society such as the elderly, young or chronically ill and likely to be worst affected by the impacts.

From Table 8, slum drains are characterized by malfunctions all below the recommended standards. For example, the range of drainage depth was 89mm while the mean width was 110cm. The general characteristics depict the bad states of most urban drainage channels. The drains consists majority of channels with open trenches, which are rectangular in shape without concrete lining and covering.

5.1.10. Mode of Refuse/Garbage Disposal

Overcrowding in the slums have led to high levels of waste generation making Bonaberi highly pollution prone. This coupled with it industrial location and their pollution units have compounded the health hazards faced by the slum dwellers. The inadequacy of formal waste management systems cause sewage to accumulate in open tarred surfaces, ponds or canals resulting to the spread of diseases. The condition becomes precarious during the rainy season when malaria rise rapidly due to limited awareness and management efforts. The government and humanitarian response usually focused on the provision of emergency kids for survival especially to displaced persons rather than ensuring environmental quality. The mode of refuse disposal in Bonaberi by the waste collection company- HYSACAM is very challenging limited by the inaccessibility of many neighbourhoods (Table 9). In some communities, residents paid private individuals to collect trash. However, not all households can afford to pay garbage collection fees and often these companies discontinued garbage collection for the whole neighborhood due to individual misconducts.

Table 9. *Mode of Refuse Disposal.*

Mode of Refuse Disposal	Frequency	Percentage (%)
Open Dump Site	98	25.7
Open Drain	45	11.8
HYSACAM	237	62.3
Total	380	100

Source: Fieldwork, 2024

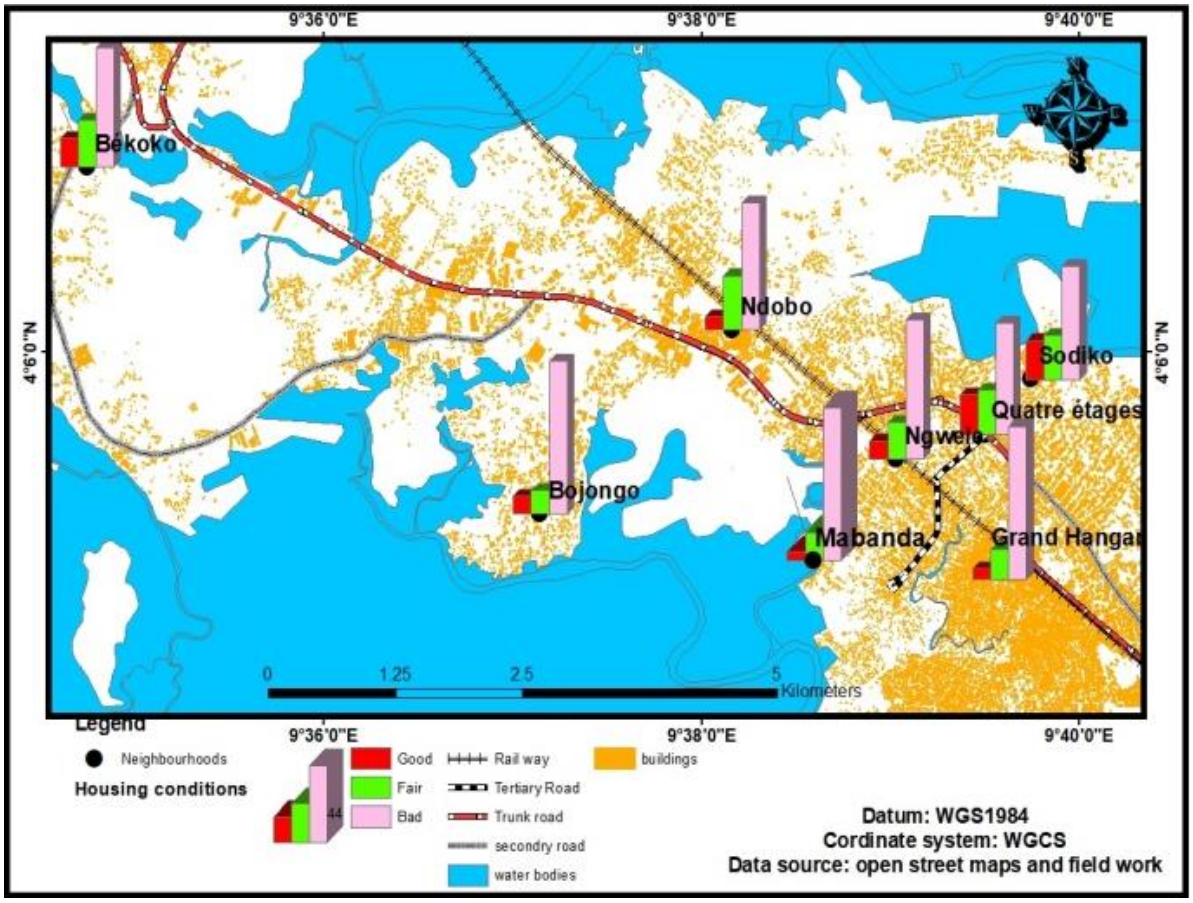
From Table 9, a significant majority (62.3%) of the respondents revealed that the HYSACAM waste collection were limited and despite municipal efforts, persons still deposit waste into open drains and they are often blocked, vacant lots and road sides especially during rainfall, which causes the drainage to be water logged or completely blocked while others deposit theirs in open spaces. These acts harbor insects, rodents and some reptiles that is dangerous to the health of the residents. During the rainy season, this means that many of the homes become flooded, and feces and garbage and other elements that are dumped into the canals end up in people's homes. This method is highly unsanitary and can lead to the spread of disease. Waste and garbage is sometimes burned in open fires around markets resulting to potential fire hazards especially if not well managed and air pollution. Also waste dump in streams may result to pollution and reduced water quantity. This method can also be unsanitary and can release harmful pollutants into the air. [50] noted that over 50% of African lives in slum conditions that results in an unhealthy life due to waste disposal challenges. Figure 9 depict the indiscriminate waste practices by residents. According to HYSACAM officials, there are drainage channels for water, but because people are reckless, sometimes they pour garbage there. So, the channels are messed and when it rains what others do is to release fecal matter into the water channel.

5.2. Slum Delineation

The delineation of informal settlement conditions is a complex process often done by urban planners using a combination of methods. The method use for this study considers the physical characteristics and condition of the buildings (poor quality, overcrowding, limited resources and lack of basic social services and sanitation (running water, electricity and toilets facilities) which can lead to the spread of diseases, the socio-economic indicator (poverty levels, unemployment and educational attainment) while the inadequate housing often made up of poor-quality materials of slum dwellers and participatory mapping approach involving all residents was used to analyze the degree of slum development. The Geographic Information System (GIS) was used to ascertain the extent of slums conditions in Bonaberi. Through this application, the condition of buildings in Bonaberi was known and classified according to their extent (Figure 10) and degree of degeneration.

Source: Fieldwork, 2024

Figure 9. *Haphazard Disposal of Waste at Mabanda and Accumulated Waste along Drains in Sodiko Neighbourhood.*



Source: Fieldwork, 2024

Figure 10. *Condition of Housing across Neighbourhoods in Bonaberi.*

Thus, Mabanda present itself as a neighbourhood that can inhabit low income earners who are mostly engage in informal activities like bike riding, fishing, chantier work, night watch and house help. The modal monthly income rage is 30,000FCFA which is less than the minimum wage rate of 42,000 FCFA. At Grand Hanger Neighbourhoods, 242 (78.8%) of buildings of the total number of 307 buildings were in a deplorable condition while 47 (15.3%) was considered to be fair and only 18 (5.8%) was in a good condition. The conditions of the buildings at Grand Hanger neighbourhood was seen to be

generally poor, hence, its classification as a slum. Out of the 198 buildings recorded at Ngwelle neighbourhoods, 141 (71.2%) was discovered to be in a poor condition, 38 (19.1%) were considered fair, while only 19 (9.5%) was realized to be in a good condition. With this prevalence of the poor buildings over the good ones, Ngwelle can be identified as a slum. At Bekoko Neighbourhoods, a total of 103 (60.9%) buildings were identified to be in a poor condition, 41 (24.2%) was fair, while 25 (14.9%) was discovered to be in a good condition. The slums conditions here are spaced between standard structures. However, the only problem remains housing quality and facilities. With the present situation of this housing quarter, the area hence regarded as a slum. At Bojongo Neighbourhoods, out of the 237 observed buildings, 186 (78.4%) were seen to be in a poor state; 29 (12.2%) were fair while 22 (9.2%) were observed to be in a good condition. These huge numbers of dilapidated buildings categorize the environment as slum.

At Centre Equestre Neighbourhoods 144 buildings was observed, of which a huge number of 87 (57%) were in a total deplorable condition, with 32 (22.5%) fair buildings, while 29 (20.1%) were observed to be in a good condition. With the deplorable condition of these buildings, Centre Equestre can as well be regarded as a slum despite having a wide range of recent buildings made by high income dwellers. However, before any construction in the neighbourhood, land reclamations are carried out around marshy environment. Thus, only few slums are spotted. A significant majority (75.2%) of the buildings in Bonaberi were in an extreme poor. Rapid urbanization and sprawl, high densities and congestions are further putting pressure on limited infrastructure and basic services to all residents, substandard thus changing the city structure including slum environment and boundaries. Many residents were caught in the act of dumping wastes in open spaces and drains which created unhealthy environment. Approximately 70% of households are slum dwellers due to population growth with deplorable condition of buildings in Bonaberi which is an obvious reflection of a slum settlement [9] corroborating the findings of [6, 38, 3] who noted over 60% of the population growth in Sao Paulo Favelas in Brazil and Kibera, Nairobi Kenya where slum residents suffering from waste excrement on streets and contaminated water supply.

5.3. Stakeholders' Management Options for Sustainable Urban Development

According to [32], while strategic urbanization is highly dependent on national macroeconomic policymaking, city governments, the private sector, development practitioners, and urban planners also have critical roles to play. Linking the urbanization management efforts of different stakeholders presents an opportunity for economic growth in a region undergoing an immense demographical shift. Bonaberi naturally is a zone that is of strategic value both physically and economically to the state of Cameroon. It is important driver of economic growth and development for Cameroon and the entire Central African sub Region (CEMAC) because of its high cosmopolitan nature and economic opportunities provided by industrial complex and businesses. This is more paramount if this opportunity is well managed and adequately for informal settlements to meet the need of urban growth and migration through increase incentives, labour and employment opportunities. Unfortunately, Bonaberi could not be able to function as a driver of economic growth and even creates a disincentive for growth if management is done in ways that are not appropriate and integrated. The City Council of Douala through the Ministry of Urban Development and Housing (MINDHU) and its partner's agencies like the World Bank have a physical program in providing strategic plans towards housing for the slums communities [9] through public – private partnership (PPP). Using this model, the ultimate goal was to create a city that living-friendly, comfortable and able to support in competing with other cities through urban renewal strategies. There are possible patterns of cooperation among government agencies, public-private partnership. This study emphasized on cooperation between the government, private sector and communities.

According to this study PPP can be defined as a relationship that tied with a contract, which the private sector is responsible for taking over the government task, either partially or wholly. The task in question is, for example concerning the construction of public facilities or other public services. Public-private partnerships in Bonaberi have brought together the resources and expertise of the public and private sectors to deliver sustainable and equitable solutions to urban developmental issues for the benefit of slum dwellers in Bonaberi. A housing PPP involves a contract between the private sector and the stakeholders including the governance actors. This strategy is done with the realignment of the government and municipal strategies to achieve the optimal use of each piece of plot of land in accordance with the existing urban functions in order to people's living conditions, environment quality, and sustainability. Urban Renewal in Bonaberi therefore related to four main points in the infrastructure, namely: housing and settlement, transportation, energy security, clean water and others involving both the public, private and the community. Urban renewal arrangement targets include both the city core and the peripheral areas. Table 10 presents an assessment of the levels of stakeholders' efforts in urban development processes in Bonaberi. Here, the degree of acceptance of the community participation constituted the key area of assessments of the field survey.

From Table 10, there is a very low knowledge on the existing of communal development plan as revealed by 55.5% of the respondents. With regard to community participation in meetings at the local council, central levels and the donor agencies to discuss on urban renewal issues and strategies in the study area, a significant majority (63.4%) and (71.4%) of the respondents were against. In addition, community participation in meetings on project prioritization was limited as revealed by 63.6% of the sampled respondents.

Table 10. *Assessment of public-private partnership in urban renewal.*

Variables	Categories	Frequency (%)
Council/communal development plan	Yes	139 (36.4)
	No	210 (55.4)
	I don't know	31 (8.2)
Perception of community in meetings at the municipal and central levels	Yes	143 (37.6)
	No	237 (63.4)
Community Participation in donor meetings	Yes	109 (28.6)
	No	271 (71.4)
Community participation in meetings on project patriotization	Yes	204 (63.6)
	No	146 (36.4)
Consideration of community priorities in projects	Yes	140 (37.6)
	No	240 (62.4)
Community participation in urban renewal projects	Yes	88 (23.1)
	No	292 (76.9)
Level of participation in urban renewal projects	Planning	108 (28.4)
	Implementation	220 (57.9)
	Measurement and Evaluation	62 (13.7)
Urban Renewal Development project carried out in the last 12 months	Roads accessibility	98 (25.7)
	Water supply	48 (12.6)
	Low cost housing	32 (8.4)
	Toilet	23 (6.0)
	Drainage systems	11 (2.9)
	Heath	19 (5)
	Public sanitation	31 (8.1)
	Markets	13 (3.4)
	None	05 (1.3)
Sharing information regarding urban renewal activities	Yes	243 (63.9)
	No	137 (42.1)
Channels of information sharing for meetings	Radios	94 (23.9)
	Invitation letter	182 (47.9)
	Phones	81 (21.2)
	Meetings	14 (3.6)
	New papers	09 (2.3)

Source: Fieldwork, 2024

This also translates to consideration of community project priorities and needs across Bonaberi. It is important to note that citizen awareness and participation in urban renewal development process in line with the framework on Law No. 2019/024 of 24th December, 2019 calls for the right of citizens to participate in local development especially on issues

related to citizen information, access to budget, report and development plans in addition to setting up information sharing mechanism and system branded with upload documents and the admittance of the collaborative role of councils with Civil Society Organizations (CSOs) to support local development and urban renewal. Unfortunately, results from this study revealed low awareness of slum dwellers in urban renewal process. With respects to the developmental projects undertaken in the last twelve months, results revealed varied projects were prioritized by government agencies and council authorities through partnership, road optimization and upgrading (25.7%) the highest followed by improved water supply (2.6%), low cost housing provision (8.4%), improved toilet facilities (6%), drainage upgrading and clearance (2.9%), healthcare provision (5%), public sanitation (8.5%), markets (3.4%) and the least none (1.3%).

Among these projects carried out by urban development agencies, the Bonaberi Slum Upgrading Project (BSUP) of urban renewal has so far been successful in improving the living conditions of the people living in the Bonaberi slums. This programme provided residents with increased access to water supply, sanitation services, and electricity supply including the construction of new infrastructure like roads, schools, and hospitals for diverse communities which also benefited internally displaced persons from other regions [21]. The Bonaberi Urban Renewal Project was a partnership between the government of Cameroon, the World Bank, and the Douala city council (DCC). The project aimed at improving the living conditions of the people in Bonaberi slums. The project includes the construction of new and affordable houses, the provision of basic services, and the creation of economic opportunities and mortgage.

Another urban renewal approach adopted in Bonaberi was entitled *'the Bonaberi Sanitation Project"*. This project is a partnership between the government of Cameroon, the United Nations Children's Fund (UNICEF), and the private sector. The project is aimed at improving the sanitation conditions in slums in Bonaberi. The project includes the construction of new toilets, the provision of sanitation education, and the promotion of good hygiene practices. These partnerships enable the improvement of the living conditions of slum dwellers in Bonaberi. Hence, for many developing cities in Africa, the arrangement of physical facilities including their extension and optimization of services for the community especially in informal settlement through partnerships with national, local and international agencies is very important, because it is the basis for inclusive and sustainable urban development [62, 63]. Corroboratively, there are a number of studies that have shown that slum renewal can be effective in improving the lives of slum dwellers. For example, the [21] found that slum renewal programs in Africa have led to improvement in the housing conditions of slum dwellers who have benefited from slum renewal programs such as increased access to water supply and sanitation services, improved ventilation, and stronger structure, increased access to education, healthcare, and transportation and reduced poverty, as well as create jobs and economic opportunities. In developing countries like India, Brazil and Kenya, the government has partnered with private companies to provide water and sanitation, schools, and healthcare services in slums with profound implications depending on the need of the communities, the level of government involvement, and the capacity of the private sector. It was indeed a valuable tool for improving the lives of slum dwellers in these areas through improved quality, efficiency and reduced corruption [17]. Unfortunately, for Bonaberi, a significant majority (57.9%) of the community leaders were involved only in project implementation. Information sharing regarding urban renewal is high as represented by 63.4% of respondent mainly through invitation letters as represented by 47.9% of respondents.

Despite all these levels of achievements of slum renewal strategies, the socio-economic growth looks of Bonaberi do not automatically provide benefits for all citizens especially where the rate of low income earners of slums continue to be acute due to high slum density, heightened poverty and increased demands for social services resulting from urban growth, migrants, influx of internally displaced persons, limited investment, corruption among others. With a relatively low level of income, population explosion, demographic changes, poor institution capacities and investments, Bonaberi has one of the largest slums within CEMAC [9].

6. Conclusion and Recommendations

This study has evaluated the conditions of slum in Bonaberi. Results obtained revealed that many of the houses were informal, as developers do not possess building permits. Tenement housing was predominant in Bonaberi; this type of building suggests overcrowding as households between 4 and 6 persons was discovered to be common. The mean age of the buildings was discovered to be 88 years. Majority of the buildings are in poor condition. A large proportion of the respondents have out-housed kitchens and family food is prepared in the open where flies, domestic animals, rodents, reptiles and filth are present. Residents of Bonaberi mostly use pit latrine as a means of convenience. These shared pit toilets were poorly maintained and serve as breeding ground for diseases vectors. Majority of the buildings in Bonaberi were constructed with poor quality materials and discovered to be in a poor states. Corrugated iron sheet was used for roofing most buildings which too many respondents were unattractive and in a very poor condition. The study revealed the state of the drainages to be free-flowing but becomes waterlogged during heavy downpours. This is as a result of some residents who deposit wastes into the drainages during this period. Waste management was crossly inadequate and uncoordinated. Despite the government's effort, some still engaged in the act of dumping their wastes in drainages and some open spaces. Over 71% of the buildings in the study area were in an extreme poor condition.

However, there are evidences to suggest that slum renewal can be effective in improving the lives of slum dwellers through PPP. This has pool resources and expertise, raise awareness, build political will and generate support from the public and through engagement and the identifications of priority needs and concerns. By critically addressing these challenges through policies and practices, it is possible to make progress on slum renewal in Bonaberi so as to improve on the lives of slum dwellers. Hence, the government agencies and urban planners should develop legislations that will guide urban sanitation thus giving room for more community participation in sanitation practices. Moreover, programs that are well-planned are more likely to be effective in addressing the needs of slum dwellers and in achieving their objectives. In such regards, the support of the government is essential for the success of slum renewal programs through proper coordination and investment.

Through careful planning and implementing slum renewal programs, it is possible to achieve significant improvements in housing conditions, access to social services, and jobs for the vulnerable slum dwellers in Bonaberi. The use of reclaimed materials should be used as sustainable options to create unique and interesting buildings for urban poor. The municipal council should provide relief to victims affected by flooding, ensure drainage upgrading and provide financial and technical assistance. The delineation of slums through zoning can also help to raise awareness of the issue and to advocate for better conditions for the residents of slums. This can facilitate government efforts in developing a comprehensive slum upgrading plan. The government should work with CSOs to promote community-led slum upgrading. This approach would give slum dwellers a greater role in the planning and implementation of slum upgrading projects. The government should engage with the private sector to explore opportunities for slum upgrading. This could help to bring new resources and expertise and increase capacities in service delivery.

Abbreviations

BSUP	Bonaberi Slum Upgrading Project
CEMAC	Central African Sub Region
CSIS	Center for Strategic and International Studies
CSOs	Civil Society Organizations
DCC	Douala City Council
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GUO	Global Urban Observatory
HLPFSD	High Level Political Forum on Sustainable Development 2018
HYSACAM	Waste Management Company
ITDP	Transportation and Development Policy
MINCAF	Ministry of Land Tenue and Security
MINDHU	Ministry of Urban Development and Housing
NHS	North West Ambulance Service
PPP	Public Private Partnership
SDGs	Sustainable Development Goals
SPSS	Statistical Package for Social Sciences
SSA	sub-Sahara Africa
UK	United Kingdom
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs Population Division
UNDP	United Nation Development Program
UNESCO	United Nations Educational Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
WEF	World Economic Forum
WUF	World Urban Forum
WWAP	World Water Assessment Programme

Conflicts of Interest

The authors declare no conflicts of interest.

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