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Impacts of dynamics in Architecture in Bamenda, Northwest Region, Cameroon

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Abstract: This paper presents the impacts of dynamics in architecture in Bamenda, Northwest Region, Cameroon. Before Bamenda was a peasant society with houses built from local materials, with the arrival of the colonial masters, these buildings began to change. What are the impacts of dynamics in architecture in Bamenda, Northwest Region, Cameroon? This study examines the setbacks caused by architectural dynamics in Bamenda from the pre-colonial era to the present. To collect data for this paper, we used a qualitative method. This method was employed through techniques such as direct observation, in-depth interviews, Focus Group Discussions (FGDs), and photography. The data were interpreted using theories such as the dynamics of anthropology and the Take-off and Modernization theories. Our findings are presented in five main themes that describe the impacts of the transition in architecture on Bamenda. Our findings reveal that the dynamics in architecture have brought the following impacts (social, economic, cultural, and environmental impacts). So many schools, roads, markets, health units, and travel agencies have been constructed in Bamenda, facilitating mobility and social cohesion. Landlords have built houses and are earning income from them through rent. The culture of the people of Bamenda is fast disappearing as the ritual site for waste disposal is turned into a dumping ground. The falling of trees for construction has also resulted in flooding and landslides. Consequently, the dynamics of architecture in Bamenda have had both negative and positive impacts. Another area of research could examine measures to mitigate the impacts of architectural dynamics in the Bamenda Northwest Region, Cameroon.
Keywords: Impacts, dynamics, architecture, Bamenda

1. Introduction

In the Northwest Region of Cameroon, traditional architecture has historically been characterized by its static nature, employing durably locally sourced material and established typology that respond to specific climatic conditions and cultural practices (Fleming, 2017; Girardet, 1999). This vernacular form, while robust and culturally significant, underwent change following the arrival of the colonial masters in Cameroon. Therefore, architecture has increasingly embraced the concept of dynamic architecture. A paradigm that moved from beyond static form to incorporate flexibility, adaptability, and responsiveness into building design and construction (Fleming, 2017; Kimengsi et al., 2017). This dynamic has affected Bamenda in many ways. The expansion of human populations away from city centers into low-density, mono-functional, and usually car-dependent communities is a process that has been operating in most towns worldwide and, in recent years, has been very rapid. Land use dynamics and variations in sprawl are interwoven phenomena that are inevitable if humanity continues to exist on the earth's surface (Awah, 2017). To live in sprawl means driving to work, driving to get dinner, driving to meet your friends. It means congestion, as its inhabitants travel ludicrous distances for work or basic services, and isolation due to the lack of the benefit of compact city life. Sprawl consumes vast areas in highly inefficient ways, destroying arable land and creating monocultures. Furthermore, a sprawling metropolis generates vastly more pollution and CO2 than a more compact one (Jagatramka et al., 2020). Urban sprawl is a multifaceted concept that directly affects traffic congestion, high oil consumption, and many other transportation issues (Awah, 2017; Njoh et al., 2018). This study will focus on the impact of architectural dynamics in Bamenda, Northwest Region.

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2. Socio-Economic and Environmental Impact of Architecture: Literature

This section gives an overview of the social, economic, and environmental impact of architecture. The British Urban Regeneration Association (BURA) reviewed best practices in urban regeneration. It concluded that historic buildings could serve as focal points around which communities rally, helping to revive their civic pride. They emphasized that care should be taken not to destroy old buildings before their potential is realized. The restoration of the early nineteenth-century St. John's Church in the London Borough of Hackney, UK, is a good example of how restoring a local building can inspire the regeneration of an area.

Research has found a negative correlation between a house's appearance and residents' feelings of inferiority. These findings were drawn from an analysis of 100 post-occupancy evaluation studies of resident reactions to multi-family housing design from across the English-speaking world. In the study, residents valued the attractiveness of their homes and environment. This was determined by a good site layout, attractive landscaping, varied and interesting views from the windows, provision of private open space, some degree of aesthetic complexity, and some degree of uniqueness of scheme subunits (Njoh et al., 2018).

Surveyed 819 interviews with the public, divided between potential new build buyers and others. They found that newly built homes are generally regarded negatively and are associated with the bottom end of the market, as there is a strong preference for traditional housing with the character of the neighborhood. However, the appearance and safety of the neighborhood were more important than the house itself, cited by (Njoh et al., 2018).

Cozens found that visible signs of decay increased criminogenic activity and reduced defensibility, underscoring the importance of maintaining properties and surrounding areas in good condition (Njoh et al., 2018). He also found that different types of dwellings were perceived as more prone to crime. Terraced housing was identified as the most defensible form of high-density development, with high-rise flats the most susceptible, according to (Bratt, 2002).

In the opinion of the three principles of sustainable design, economy of resources, life cycle design, and humane design provide a broad awareness of the environmental issues associated with architecture. Building and window designs that utilize natural light have been found to enhance occupants' psychological well-being and productivity. Stripped wooden flooring can amplify the noise of everyday household activities and may cause unhappiness, as sound travels more between homes than through street-level areas. The concept of the roof gardens has been a significant success in Germany. German architect Rudolf Doernach has proposed more radical ideas. Many of his designs, including a chapel in Bonn, Germany, suggested that plants should be incorporated within the façade as an active building material with the ability to reproduce itself, cited by (Vishnu & Amuthakumari, 2019).

found that the workplace's aesthetic could create an environment that is inspiring and stimulating. This is achieved by providing an environment that combines the familiar and unfamiliar, natural and hi-tech elements, tactile surfaces, mood-enhancing lighting and sound, and standard and unusual furnishings. This all contributed to creating a fun working environment, generating energy and enthusiasm CABE. (2003). Creating Excellent Buildings. Commission for Architecture and the Built Environment. The case study conducted by Vanson Bourne consisted of 200 middle- and senior-level management reviews in the UK, drawn at random from the legal, media, and financial services sectors cited by (Wallace, 2010).

According to (Cozens et al., 2005), the buildability of a building may be considerably improved by adopting a "loose fit" approach. This involves finding a balance between the choice of building materials and building services to enable ease of installation, rapid construction, simplified maintenance, and greater flexibility for future adaptations. This approach may also accelerate construction and, therefore, reduce rolled-up interest costs accumulated during this period. On large projects, this may represent around 25–30% of the overall construction cost.

Research has demonstrated how workplace design can help stimulate creativity, attract and retain the best staff, and improve organizational agility (Macmillan, 2006). However, other research has shown that a balance needs to be struck in how space is arranged. The challenge lies in balancing communication and concentration when responding to the needs of both the company and the individual (Jagatramka et al., 2020).

In 2003, CABE published Creating Excellent Buildings, a step-by-step manual that considered the client's role across four procurement stages: preparation, design, construction, and use. The case study of the Lewisham Children's and Young People's Centre in London, UK demonstrates how a design competition can deliver an excellent building. All designs incorporated generous amounts of natural light and ventilation to enhance energy efficiency and create a comfortable, therapeutic environment. This approach has improved the building's external appearance, provided views, and aided navigation within the building (Chen et al., 2023).

3. Methodology

Anthropologists have developed methodologies for gathering data, testing hypotheses, and theories to understand human diversity. These methodologies are used in naturally occurring human societies and cultures (Perini et al., 2013).

Data for this article were collected from primary and secondary sources. We used qualitative methods to collect information to gain a deeper understanding of the cultural, social, economic, and environmental context in which architectural dynamics are shaped and experienced in Bamenda.

In addition, an interview schedule was organized, along with the interview locations. The venues were chosen based on the informant's convenience. Furthermore, we informed our informants of the purpose of our research and solicited their participation.

Some informants were interviewed on the spot without any notification. Interviews were conducted in homes, offices, health centers, palaces, and other venues, at the informant's discretion. The informed consent form, ethical clearance, and research authorization were read and presented to the informants. Once they agreed to participate in this research, they signed the informed consent form before we could proceed.

To ensure this work is credible, we conducted fieldwork. Primary data were collected from 94 participants via a snowball sampling technique involving notables, administrative authorities, businesspeople, engineers, technicians, and teachers, through in-depth interviews.

Focus Group Discussions (FGDs) were organized to understand different opinions on the impacts of architectural dynamics in Bamenda: one with administrative and traditional authorities, engineers, proprietors, and technicians, and the last with participants from different professions.

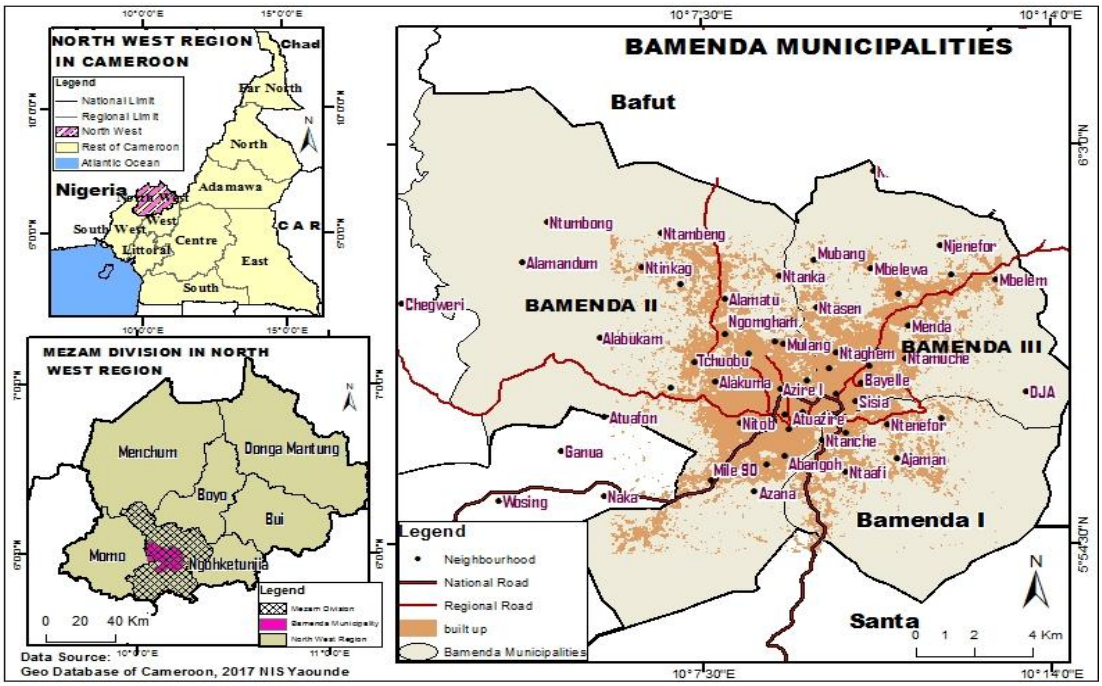
A digital camera was used to snap photos of the architecture in Bamenda. The photos snapped added credibility to the field-collected information. The following tools helped us gather data for this article: interview guides, FGD guides, and observation guides. Lastly, the literature review was used to obtain important historical facts about the dynamics of architecture. Data for the paper were analyzed immediately after fieldwork ended, using content analysis, and pictures were interpreted iconographically.

3.1 Presentation of Research Area

Bamenda is the headquarters of the Northwest Region of Cameroon, located on the Northwest Plateau, and it also doubles as the capital of the Northwest Region. It is situated between Latitude 5°57'34 N and Longitude 10°0845 E with an elevation of 1413 above sea level.

Bamenda is the administrative seat of Mezam Division, the Regional Headquarters of the Northwest Region, and the largest town in the Northwest Region. Bamenda covers a surface area of 71.23 square kilometers. Bamenda is the commercial, political, and socio-economic hub of the region and links other suburban areas. It has a population of about 74,127 inhabitants, according to the 2005 population census. It is a City Council made up of three Sub-divisional councils.

The city covers the areas of Nkwen, Mankon, and Bamendankwe. Hence, it is surrounded by other villages and suburban areas. It shares boundaries with Bali and Mbengwe to the West, with Santa Subdivision to the South, with Bafut to the North, and with Tubah to the East. Due to the nature of growth and rapid population increases, these places are sometimes considered part of an urban area.



Map 1: Location of Bamenda in the Mezam Division of the Northwest Region of Cameroon. Source: (Ntumngia & Fombe, 2022) in the Cameroon database, 2017 NIS Yaoundé.

4. Results

4.1 Social Impacts of Dynamics in Architecture in Bamenda

Regarding this work, we are interested in the effects of architectural mutation on Bamenda. It has either improved living conditions by adding value to traditional ways of life or led to a decline in residents' living standards. In this section, the impacts will be divided into two categories: negative and positive effects of architectural dynamics in Bamenda. Regardless of how beneficial a developmental project may be in a community or area, it is certain that the same project will also have some consequences. Limiting the discussion to only one side of these impacts would make the work incomplete. By addressing both the negative and positive impacts, this study aims to provide a balanced analysis.

4.2 Positive Social Impacts of Dynamics in Architecture in Bamenda

With the population increase in Bamenda, the area has been dramatically transformed into a spontaneous urban space, resulting in a form of social order that is voluntarily created. Another characteristic of such cities is that they are largely unplanned and heavily influenced by the interactions of the inhabitants, who bring diverse mindsets. Rapid population growth and migration, rising land values, mixed land uses, and significant infrastructural development contribute to this dynamic (Vishnu & Amuthakumari, 2019). Efforts by theorists, alongside the socio-economic benefits available to many who take advantage of them, have shaped these spontaneous social orders. These include language, culture, and markets (Davis, 2009).

Almost everyone likes the trends in architectural dynamics. There is something that improves taste and ties people into a social life. When we talk about social life, we mean interaction. When someone builds a good house, people like to copy and improve on it to make it look more beautiful. There is that notion of competition; people enjoy beautiful things. They want to socialize with people of a certain standard. Everyone is struggling to have a befitting structure for themselves (Wheeler & Almeida, 2006).

The Bamenda population has appreciated the change in architecture. A good number of informants indicated that the mutation has had a positive impact on their lives. There has been some degree of socialization and lots of exchange. The inhabitants of Bamenda have been striving hard to improve their living conditions by constructing suitable structures for themselves. That is why when an individual puts up a fantastic structure, it is admired by many, and some are forced to adopt it. This situation has brought in the spirit of competition among the inhabitants of Bamenda.

It encourages competition because the inhabitants want to show they have wealth and need to live in a good house. The desire to build better structures has gone a long way toward transforming the landscape, making it more attractive. Bamenda has been noted for attaching special interest to constructing well-furnished homes for pride and prestige, which is one of the motives driving the spirit of competition. It should be noted that over time, the inhabitants of Bamenda have worked relentlessly to demolish their old buildings and build befitting structures that genuinely reflect their social status. The Bamenda man is proud, and that is why he likes people to see him living in a better environment, with the good structures he has put up (Macmillan, 2004).

Building houses and respecting town planning laws will go a long way toward improving people's well-being. A well-ventilated building will ensure it is healthy, as someone may come here and inhale foul odors, which can lead to illness. Even your residential house must be thoroughly checked by the town planning officials to ensure that it meets specific standards. It will prevent the inhabitants from suffocating, unlike some of the old structures that existed here in Bamenda. They had few ventilators. If you have breathing problems and visit a congested house, you are likely to suffer more than if you were in a less congested one (Vandell & Lane, 1989).

In those days, because there were no town planning laws in Bamenda, the inhabitants were putting up funny structures in the name of houses, since there were no building laws to regulate house construction. With the follow-up from the town planning agents, the buildings will be designed to promote the well-being of the inhabitants. Social infrastructures can support such forms of cohesion in healthy communities and enable communities to reach levels of social well-being (Alexander, 1964; Macmillan, 2006).

When the structure is well constructed, it will improve ventilation, making the building more favorable for human habitation. It will reduce the risk of the inhabitants getting sick. Building design can directly affect the health and well-being of the occupants (Anand & Sen, 1996; Webster & Lai, 2003).

Architecture began as a means of protection, a shelter from our surroundings. It gradually evolved into an art form that introduced subjectivity, creativity, and beauty. Today, we are seeing architecture evolve yet again, this time around from an art form to a subject of psychological study and purposeful implementation focused on psychological well-being (Sen, 2017).

Furthermore, Vishnu & Amuthakumari added that research by Vanson & Bourne (2005) demonstrated that workplace design can help stimulate creativity, attract and retain the best staff, and improve organizational agility [17]. However, other research has shown that a balance is needed in how space is arranged (Shirazi & Keivani, 2017).

Modernity has made it so that toilets should be designed internally, so you do not have to go out of the house whenever you feel the urge to use the toilet. Modern toilets function with water, which is why they are referred to as water-closed systems. The toilets are clean and comfortable for human habitation. This has gone a long way to improve the hygienic conditions of the inhabitants. Here is an extract from one of our informants. With modern architecture, we have improved toilets and our health and sanitation, too (Altomonte & Schiavon, 2013).

4.3 Negative Social Impacts of Dynamics in Architecture in Bamenda

The human population worldwide has been expanding dramatically, including in towns and cities, and figures have been rising recently; if care is not taken, they will continue to rise. The way land has been used, and its variations result in sprawling areas that are unchangeable due to the presence of human beings on planet Earth (Frontczak & Wargocki, 2011). For people to live in the sprawl, they must be driven out of work and forced to move to meet friends. It will cause congestion, as the inhabitants will have to travel long distances to work and have limited basic facilities. Sprawls consume extensive areas inefficiently, going beyond reducing available land and leading to monoculture. High crime waves, armed robbery, prostitution, scammers, people now do things that they were not supposed to do just because they want to survive in urban areas (FGD, City Council Hall, September. According to Monochromatic colors, poorly placed windows, an absence of architectural detail, and repetitive styles produced a unique form of sensory deprivation. Not only did this trend result in a lack of intellectual stimulation, but it also effectively removed every aspect of human touch, creating a cold,

unwelcoming environment that could not elicit a positive physiological response or a sense of well-being (Frontczak et al., 2012).

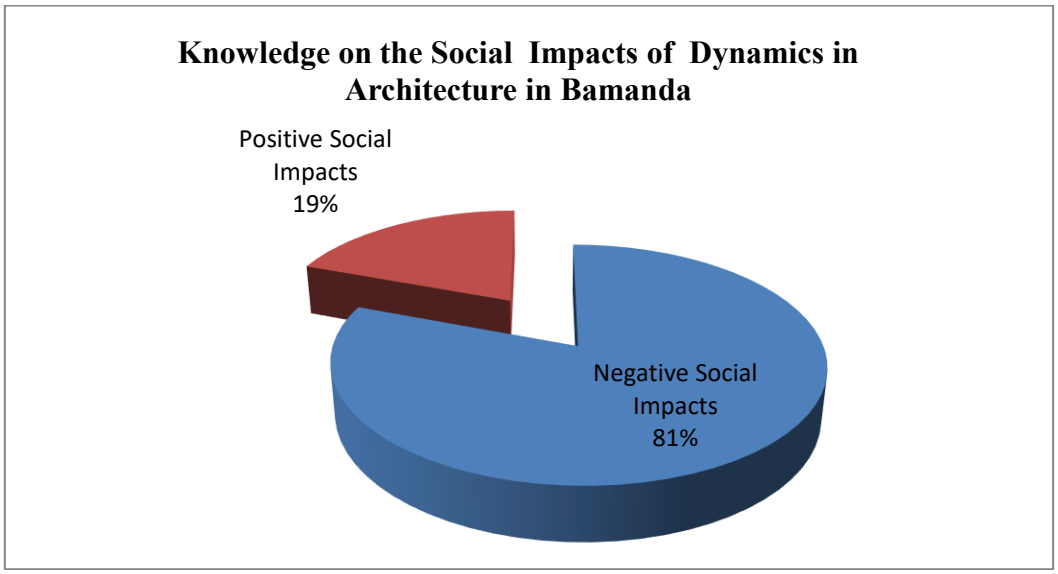


Figure 1: Demonstrate Percentages of Respondents on Impacts of Dynamics in Architecture in Bamenda
Source: Ngala (19 September 2022)

According to our informants, 71 of the 94 participants (81%) indicated that the transition in architecture is visible in Bamenda (Figure 1). The indicators that we used include high crime wave, armed robbery, banditry, kidnapping, scamming, drug abuse, delinquency, traffic, congestion, prostitution, deviant behaviors, population increase, high rents, promiscuity, and stealing. This means that the negative social impacts of architectural dynamics outweigh the positive ones. One can say with certainty that the negative social impacts are disadvantageous to the inhabitants. They mentioned that all the above indicators are visible in Bamenda. Meanwhile, 29 informants highlighted that the transition has brought positive impacts in Bamenda. They cited an increase in the construction of infrastructure such as schools, churches, health units, markets, travel agencies, parks, and snack and drinking spots, the list is not exhaustive, thereby representing 19%. The infrastructure and structures mentioned above have improved the living conditions of Bamenda's inhabitants. Nothing can be good 100% of the time without setbacks or consequences.

A large proportion of migrants who cannot afford decent housing resort to low-quality housing in inner-city slum neighborhoods such as Old Town, Ntamulung, Atua-Azire, and Ayaba, as well as to squatter settlements in hazard-prone zones such as Sisia, Abangoh, and Mulang. These neighborhoods are characterized by poor toilet facilities, inadequate waste disposal, poor housing structures, and insufficient supplies of electricity, water, and access roads (Ricci, 2018).

4.4 Economic Impacts of Dynamics in Architecture in Bamenda

The transition in architecture in Bamenda has brought economic impacts. The economic impacts of architectural dynamics are evident. The inhabitants of Bamenda earn a living thanks to these architectural dynamics. The population has grown, and landlords have built additional houses, leading to higher rents. Thus, permitting them to earn income from house rents enables them to live. Markets have been created to help businesses generate income. The inhabitants of Bamenda are generating substantial revenue and profits from thriving businesses. These businesses take place in buildings such as shops, stores, sheds, offices, establishments, enterprises, agencies, and hotels.

The evolution of architecture in an area often results in the construction of Commercial Residential Buildings (CRB) along streets and around public spaces. The concept of CRB is closely associated with houses and shops (Frantzeskaki et al., 2016). It is evident in many different cultures and has emerged in various towns and communities, influenced by the economic conditions of the inhabitants living and working in those areas. CRBs are considered a result of the benefits of architectural transition within a cultural milieu, serving as a necessary component for adaptation.

Yes! Bamenda has improved economically with modernization. We can have tertiary activities, activities that can generate income. Modernization is an eye-opener. People have the privilege to open small businesses, and you will discover that the distance we used to cover on foot was wasteful and time- and energy-consuming to reach the market. Meanwhile, if we have items closer, we can easily get them and cash up with our daily activities. Some of those markets have helped us so much that it is easy to drop in on one and pick whatever you need in a short time. We are content, and that is why we concentrate in this urban area. Improved means of transportation have brought about stores, shops, retailing, and other business opportunities in the quarters (Programme, 2009).

The information indicates that modernization has improved the Bamenda economy. It has enabled them to generate income through activities such as tertiary and marketing. The markets are being designed in a sustainable manner that can be easily adapted. If it must be modified, the effects will be less. He reiterated that markets in those days were usually located far from home, and that to reach them, you had to cover a long distance on foot.

The introduction of modernization has encouraged the inhabitants of Bamenda to open businesses to sell their products. Recently, markets have been established almost everywhere to facilitate mobility and access. This transition in architecture has improved the economic conditions of the Bamenda men. For example, so many hotels have been constructed to welcome strangers and visitors. Also, it is a source of income for many landlords, as it is common to see story buildings constructed and reserved for rent (Du et al., 2021).

The economic sector is one area in which this architectural dynamic has impacted. In those days, there were few hotels, but recently we noticed a drastic increase in the number of hotels opening their doors in Bamenda. So many visitors come to these hotels; strangers and foreigners visit Bamenda and are lodged here. It should be noted that these hotels have employed many people as cooks, drivers, servers, and cleaners. It should be emphasized that this transition has also affected the transportation sector, as the information below shows it has led to many businesses, such as travel agencies, that transport people from one place to another. These agencies have reduced unemployment by recruiting some of the population to work as drivers, bus conductors, and loaders. They are earning a living from these activities (Ragazzo, 2021).

The CRB has been noted for revitalizing city centers and streets as a strategy to diversify urban areas and make them more friendly to residents. Buildings constructed along streets or in city centers play a significant role, providing proximity services and supporting daily activities. The merging of functions within CRBs contributes to socio-economic processes that are heavily influenced by the economic conditions of urban centers and can drive changes in building units. Socially, CRBs are grounded, while globally, they contribute to the creation of cultural forms within the urban development process.

Based on the CRB concept, these buildings are typically designed to accommodate multiple functions, with shops along the roads and city dwellers occupying the upper floors. This design results in variations in residences or shops depending on the location of the building, while also influencing the dynamics of the street and extending impacts to surrounding streets (Cohen, 2015).

Economically, housing is sustainable when it is accessible (to all ages, sexes, classes, and income levels) and affordable (through government involvement in the housing sector, including the provision of incentives, encouragement of housing finance, upgrading schemes, and the practical implementation of housing laws and regulations). Housing is environmentally sustainable when the construction technologies and appliances used are environmentally friendly (Hoornweg et al., 2011).

4.5 Cultural Impacts of Dynamics in Architecture in Bamenda

The culture of the Bamenda man has been affected by changes in architecture. The way they used to construct their homes in the past is different from what is held today. The designs and building materials have also drifted towards modernity. There are some lifestyles that architecture imposes on the inhabitants of Bamenda. This study notes that the current broad agglomeration of cultural and creative sectors has been responsible for producing such homogeneity of urban architectural design forms and lifestyle concepts that it may one day no

longer provide sufficient inventive ideas for blending innovation in architectural practices, requiring instead centralized nationalist intervention models to sustain the traditional built infrastructures of society and its culture. The transformation of stressed cities into resilient spaces requires a range of conditions, primarily social capital, technological capacities, sustainable natural resources, and governance mechanisms (Fiedler, 2002; Lang, 1987).

Figure 2: Showing a Blend between a Cement Block and Sundry in a G-Plus 1, around Foncha Street
Source: (Ngala, 26 September 2021).

The building in Figure 2 is one floor high, and the ground floor is constructed with sundry blocks and is choked with cement mortar. The upper floor is constructed of cement blocks and is choked with cement mortar. The foundation of the building above is constructed with foundation blocks and choked with cement mortar, preventing water from penetrating the foundation and, above all, ensuring that it is solid. In those days before modernity, the inhabitants of Bamenda used earth for construction, but as time passed, they began to look for other ways to improve their homes. Whether by chance or not, they began using modern building materials, such as cement mortar and cement blocks, for construction. Modernization has led many people to adopt the use of cement blocks in construction. Later, they saw the need to blend traditional and modern building materials, as shown above. Looking keenly at Figure 2, the foundation is suspended above, indicating that this area is swampy. This house is being constructed in a valley around Foncha Street. The foundation was backfilled, which is a permanent solution adopted by the inhabitants of Bamenda to mitigate flooding, especially during the rainy season.

This building was constructed recently. The inhabitants of Bamenda have been returning to the use of sundry blocks for construction after abandoning them for reasons best known to them. Until recently, during the ongoing Anglophone crisis, the weaknesses of cement blocks were demonstrated. Bullets have penetrated buildings constructed with cement blocks and taken away so many lives (Fiedler, 2002). The structure shown above is an actual image of a blend of traditional and modern building materials in Bamenda architecture.

I think the culture of the Bamenda man has changed. We started building with bamboo, grass, sticks, and stones from one phase to the next. Culturally, many people from Bamenda have moved to other cities and around the world, adopting Western cultures. When they return home, they try to adapt to their culture. The culture of Bamenda is no longer respected due to modernity and civilization. The building materials used in construction are blended, such as earth and soil with cement blocks (Churchman, 2002).

The Bamenda culture has changed architecture. The indigenes of Bamenda have been using local building materials existing in their area for construction. With evolution and modernization, Bamenda's culture has changed. Some have been fortunate to stay out of Bamenda, thereby learning to use other modern construction materials. They have even gone so far as to use a blend of local and modern materials in the construction process. Cornilus challenges the popular view that Bamenda's culture is dying. As I mentioned earlier, when we started building bamboo from one stage to another, it was accompanied by rites and rituals. You were being initiated,

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but today that aspect of the culture is no longer there because people pay workers to build their houses. In the past, the people of Bamenda used to mobilize friends/neighbors and entertain them at the end of the day. That community spirit is no longer there. Culturally, the people of Bamenda have travelled and adopted Western cultures. When they return home, they try to adapt to their culture. The culture of Bamenda is no longer respected due to modernity and civilization. The free, communal spirit of working is no longer there. If you invite people to come and do work for free, you will see only a few people. People want to work and get paid, not to come and work and receive food or drinks (Elouga, 2006).

The transition in architecture in Bamenda is stepping down the culture of the area. The arrival of people from different backgrounds has some negative consequences, as the culture has been suppressed. Some once-standard practices are gradually being abandoned. In the past, before you put up a structure, some rites and rituals were supposed to be performed, since they used purely traditional building materials from the community to construct their houses. In some communities, men were being initiated since building a house in those days was a sign of maturity. There were things and conditions to be met before you were considered a man; putting up a structure was one of them. It was not easy men were to undergo some initiation rites. Modernity and civilization are imposing a new way of life on the inhabitants, leading them to care less about past cultural values.

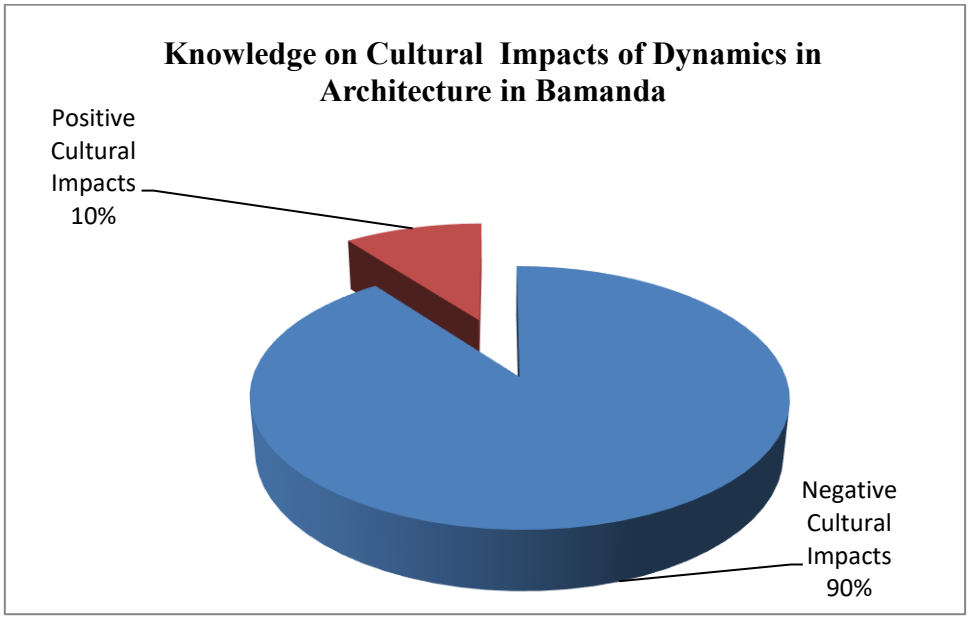

Chart 1: Demonstrate the Percentage of Respondents on Cultural Impacts of Dynamics in Architecture in Bamenda
Source: (Ngala, 12 December 2022)

Of the 94 informants who participated in this data collection exercise, 79 indicated that this change in architecture has seriously affected the culture of the Bamenda man, making it depreciating, representing 90% (Chart 1). The indicators of these disappearances of culture include cultural values, types of building materials used in construction, festivals, ceremonies, shrines, rites, and rituals. Ancestral worship sites like the Bamendankwe shrine have been turned into dumpsites. Modernity is a threat to culture and tradition, thereby helping to wipe away the culture of the Bamenda man.

Meanwhile, 21 informants stressed that this change in architecture is fixing the culture of the Bamenda man, representing 10% of the total. Among the informants interviewed, they made us understand that the culture of Bamenda is depreciating and that, if care is not taken, it will get worse so long as the trends of modernity keep sweeping across the world, including Bamenda. The switch in architecture is causing a serious problem for Bamenda's culture. That is why the elites of Bamenda are doing everything they can to revitalize their culture by organizing annual cultural festivals and ceremonies to appease their ancestors.

4.6 Environmental Impacts of Dynamics in Architecture in Bamenda

Environmental impacts examine the interactions between humans and natural resources in each habitat. The desires of human beings within an environment are enormous and changing; that is why structures within the environment are designed to adapt to it. There is a relationship between the inhabitants and the built environment (Elouga, 2006). The relationship that exists between human beings and their environment should be mutual (Cozens et al., 2005). The role of values and attitudes is essential for creating a favorable environment for human habitation in a changing society (Elouga, 2006).

4.7 Positive Environmental Impacts of Dynamics in Architecture in Bamenda

Considerable efforts have been made so far to build sustainable buildings, especially in the Western world, inspired by Agenda 21. However, these efforts have not yet yielded sufficient results to offer real hope. Therefore, we must continue to raise awareness of the problems and take practical steps towards achieving a balance among people, buildings, and the environment. More so in the developing world, where high population growth rates coincide with scarce, dwindling resources. At the same time, we must recognize the importance of considering local and regional circumstances, demands, constraints, and opportunities, given migration trends, especially in developing countries, which are exacerbated by political, economic, and social turbulence (Davis, 2009).

Architecture has helped to develop our environment. If you go around, you will see development everywhere. People are planting flowers, trees, and carpet grass. When you look at it, it is good. You can admire it; everywhere is clean and beautiful. We have been sensitizing people to plant trees because it will make the environment friendly. In the past, the area was a forest and was occupied by elephant grass stocks. It is difficult to see any empty land in Bamenda today. Before, houses were scattered and dotted across the landscape. It was challenging to carry out construction works because there were no roads; only footpaths existed. The roads we had in the past were narrow, and in the rainy season, they were muddy; in the dry season, they were dusty. The tarring of roads has made the environment clean (Churchman, 2002; Elouga, 2006).

According to the information above, he believes this architectural mutation has transformed Bamenda's landscape. The scene looks different from how it used to be. Inhabitants have planted environmentally friendly trees, flowers, and carpet grass to beautify the urban space. When environments are pleasant, they can make us feel excited and stimulated, releasing chemicals like oxytocin, or they can make us feel pleasantly relaxed and at peace, helping our autonomic nervous system run smoothly (Narvaez et al., 2015).

4.8 Negative Environmental Impacts of Dynamics in Architecture in Bamenda

Rapid changes in globalization and urbanization are a serious challenge that most urban areas around the World are facing. It has far-reaching consequences, such as the degradation of natural ecosystems, which negatively affect climate change (Narvaez et al., 2015). According to studies, nearly 9.8 billion people will live in cities (Fiedler, 2002). Regarding statistics, 80% of greenhouse gas (GHG) emissions into the atmosphere are caused by Cities (Fiedler, 2002). In light of these setbacks, efforts have been galvanized to ensure sustainable development and guarantee human security and property. Hence, sprawling land-use development causes substantial pollution and CO2 emissions into the atmosphere (Chen et al., 2023). Peri-urban areas in developed and developing societies have been undergoing social, physical, and economic transformations.

People are building in swampy areas. The whole of this place is a swamp. People are building and getting closer to swampy areas. If you go to Below Foncha in the rainy season, you will see for yourself. So many people will leave their homes and go to neighboring quarters because of flooding and only come back when the water level has dropped, because they built in swampy areas. When you fill a swampy area and build a house, when it rains, the water coming in is blocked, and the people behind who did not block theirs will suffer flooding. If you go to Mulang, you will see houses where water has already covered the entire building, leaving only the rooftop visible.

These houses were built during the dry season, as people began buying plots around, unaware that there would be floods during the rainy season. When they buy these plots, they fill the house's foundation with ground. The City Council is totally against land reclamation and settlement in risk zones, but when you go to these swampy areas. Despite the council's call for people not to settle in these swampy areas, they still settle there, disregarding the risks (Macmillan, 2004; Vandell & Lane, 1989).

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Mile 4 Nkwen is a swampy area, but because the inhabitants want to build their own structures, they are forced to go right into the swamp. A glaring example is Below Foncha: during the rainy seasons, the inhabitants abandon their homes and go elsewhere for safety, living there until the water table drops. This is because they buy these plots during the dry season without considering the effects of rain, including prolonged rain, during these periods. Faced with this problem, they must flee to another stable area. If you visit the Below Foncha or Mulang quarters, you will see for yourself that the majority of the houses in these quarters are affected by floods. Backfilling seems to be a permanent solution to fight floods, according to our informants. It requires raising the foundation to about 2m and filling it with soil. The soil is dammed well before they start elevating the structure. The reason for backfilling is to prevent water from penetrating the foundation. The Bamenda City Council frowns on land reclamation because of the dangers associated with it. However, the inhabitants, for one reason or another, are stubborn and refuse to yield to council regulations.

Figures 3 and 4: Showing Houses Constructed in a Swampy Area around Foncha
Source: (Ngala, 9 August 2021).

Taking a close look at figures 3 and 4 above, you can see that the entire building is flooded. Below Foncha is one of the risk zones forbidden for construction by the Bamenda City Council and Sub-divisional Councils. The owner has abandoned these structures due to flooding. Grass has been growing in and around these buildings due to runoff. Since the buildings are unsafe for human habitation, they have been abandoned. The buildings are filled with water.

The effects of floods have transformed the building into an aquatic environment. During the rainy season, the entire area below Foncha is flooded, making human activities difficult. Below Foncha is a swampy area because when it rains, all the runoff water from the upper sections of Bamenda drains here, making this place waterlogged and very dangerous for human habitation. The color of the standing water indicates it has been standing for a long time and is continuing to accumulate, especially during the rainy season, when severe downpours occur.

The buildings are sinking due to flooding-related damage. It should be mentioned that the cutting of trees to construct buildings is seriously destroying the environment as one of our informants indicated below that: The cutting down of trees for the construction of houses and buildings has accelerated flooding within Bamenda, the amount of rainfall trapped by roof tops are so much compared to the past where we had tress that helps to trap intercept rain and infiltrate it into the ground. The volume of runoff has increased significantly, leading to the collapse of buildings and structures (Davis, 2009).

Another informant noted that we are now suffering from poor waste management, land pollution, air pollution, and water pollution due to the high concentration of houses. Looking around, there is a lot of dirt being

deposited almost everywhere, especially along the road. These places have been turned into dumping grounds. We also have floods due to population growth, which cause severe traffic problems after rainfall. It is not easy to leave one end of the town for the other (Ragazzo, 2021).

Our information indicates that this architectural mutation has caused serious environmental problems, including waste management issues, air pollution, and land pollution, and that the concentration of houses is solely responsible. The recent concentrations in the history of the planet raise the specific problem of an entirely constructed environment: pollution, technological vulnerability, and the difficulty of organizing space, etc. (Chen et al., 2023). It is very easy to find dirt everywhere because there is no proper mechanism in place to ensure waste is properly treated. Major roads have become waste disposal points, as you can see heaps of dirt littered everywhere.

The transition in architecture in Bamenda has created a waste management problem. The structures have increased; the population has also doubled, allowing garbage to accumulate. The disposal of the waste has remained a big challenge for the City Council. In those days, with a small population and farmland available here and there, this house's garbage was used as manure to enrich the farms. However, the quest for improved living conditions has pushed the inhabitants of Bamenda to abandon the farmland they had used for housing and buildings. They are forced to accumulate this garbage and dump it at road junctions after waiting for waste management agents for weeks, without any sign of passing.

Figure 5: Showing a Huge Pile of Garbage alone on Mile 3 Road
Source: (Ngala, 25 August 2021).

The population of Bamenda has doubled, increasing the number of houses available for refuge. Figure 5 above confirms that Bamenda faces a serious waste management problem. Some roads have been turned into dumping grounds. They have been dumping waste on the road until the pile of dirt occupies a portion of the road, slowing the movement of people and vehicles. This road link connects Mile 3 and Mile 4 in Nkwen, but the waste disposal on this stretch prevents two vehicles from passing each other at the same time, causing severe traffic congestion.

This environmental problem of poor waste management is posing a serious threat to human habitation, as it serves as a breeding ground for mosquitoes. The odor generated by these piles of refuse is a nuisance to the inhabitants living around these dump sites, making them feel uncomfortable.

A close look at Figure 5 shows that at times the dirt goes right into the middle of the road. The long-term effects of waste disposal damage the tar on the road, causing it to deteriorate faster due to the toxic content of some of these refugees. In the middle of the waste is an electric pole; it will also be damaged by the waste disposed around it.

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Figure 6 shows Sisia, a quarter situated under the slopes of the Bamenda Up-Station hill. Above the Sisia quarter is a huge rock that, out of fear, the Bamenda City Council forbade its inhabitants from constructing on this site despite warnings from the administration, and the City Council's people went ahead and constructed there. Sisia quarter is one of the risk zones that the Bamenda City Council has marked for non-human habitation. Some inhabitants of Bamenda violate the law and build on this site because of land scarcity and the desire to build their own houses, as land is sold at lower rates than in other safe areas around Bamenda. Landslides are fast becoming a significant environmental problem in Bamenda, driven by rapid urbanization.

Figure 6: Showing the Massive landscape above Sisia Quarter

Source: (Ngala, 7 August 2021).

Landslides are observed to occur during the heart of the rainy season, i.e., between July and September, with rainfall ranging from 340 mm to 450 mm. Landslides in Bamenda are thus provoked by rapid urban development resulting from the progressive occupation of steeper slopes, achieved by cutting terrace-like areas and redistributing materials to provide building sites.

Heavy rains tend to soak and dislodge large rock masses, sometimes resulting in the complete crushing or burial of an entire housing unit (Ricci, 2018).

Furthermore, Edward added that: "Imagine if landslides occur on this slope soon; it will cause serious human and material loss." The population of Bamenda is stubborn; that is why they keep constructing and settling here, despite the government not taking any serious measures to discourage them from building on this slope (Narvaez et al., 2015).

Looking at Figure 6 above, there are many green plants, which justify the site's situation. It is challenging to construct here despite the risk associated with this site, but some inhabitants are breaking the law and constructing on these sites.

They have not learned from the landslide that happened on 7 November 2024 in Ngouche neighborhood around Bafoussam, killing close to 43 people, and Mbankolo, with 30 inhabitants, was killed on 28-29 October 2019.

Based on the field data we collected, 81 of our informants reported that this change in architecture is affecting Bamenda negatively (Chart 2). This has severe environmental effects, accounting for 92%. Our indicators were

flooding, habitation of risk zones, settlement, deforestation, poor waste management, land pollution, landslide, water pollution, air pollution, and climate change.

They believe this change is causing significant harm by destroying the environment. 19 of the informants indicated that this mutation is positively affecting Bamenda, contributing 8%. They think that the transition has added beauty to Bamenda with the construction of monuments, schools, churches, markets, hospitals, and tarred roads.

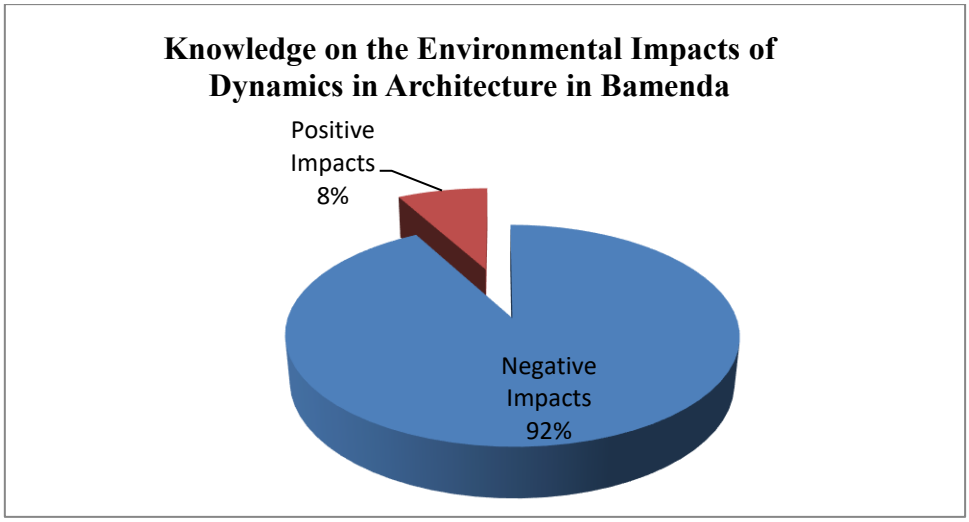

Chart 2: Demonstrate Percentages of Respondents on the Environmental Impacts of Dynamics in Architecture in Bamenda
Source: Ngala (16 December 2022)

Thereby changing the landscape. In addition, the change has improved Bamenda, making it cleaner and healthier for human habitation. On the other hand, the construction of these structures: houses, bridges, roads, markets, and hospitals, etc, has done more harm than good to the inhabitants of Bamenda.

5. Discussion

The inhabitants, together with the government, are leaving no stone unturned to see that Bamenda has the facelift it deserves. A lot has been done regarding infrastructure and development. The respondents attributed the changes in structures and buildings in Bamenda to both negative and positive impacts. First of all, infrastructure construction in Bamenda has boosted socialization and interaction. So many people meet in places like markets, hospitals, schools, parks, and snacks.

It has dramatically increased the population, as so many villagers and rural dwellers are relocating from their villages and other remote areas to Bamenda. One can say with certainty that this architectural transition has improved the living conditions of urban dwellers in Bamenda. On the other hand, it has resulted in congestion and overcrowding, a high crime wave, armed robbery, prostitution, and kidnapping; the list is long just to make ends meet.

In addition, from an economic perspective, many inhabitants have built houses and multi-story buildings and are earning income from the rents they collect at the end of the month. It has also created many business avenues, such as microfinance institutions, banks, markets, parks, travel agencies, insurance companies, car-washing stations, snacks, and the list continues.

Culture is another domain in which the dynamics of architecture have also been felt. Even though they say culture is the backbone of every community, the culture of the people of Bamenda is in decline, and many of our respondents accused the winds of change blowing across the world, known as urban dynamics. Some ancestral sites have been turned into dumping grounds.

Places reserved near some palaces have been sold, and people have built around them, encroaching on the population and disrupting other human activities. Streetlights light all the quarters and the entire community. Night rituals that used to be conducted at night are no longer performed.

One good thing is that most inhabitants are switching back to sundry blocks, an important building material used in the past. This is due to the weakness of cement blocks in the face of the ongoing Anglophone crisis in the Northwest and Southwest Regions of Cameroon, as bullets have penetrated houses constructed with cement blocks and killed many people. People are being buried in public cemeteries, and no rituals are performed because of insufficient space in their compounds.

The environment is the highest domain in which this urban dynamic has had a significant impact. As for environmental impacts, it has transformed Bamenda's landscape, giving it a facelift. The buildings and structures built over the years have added beauty to the area. Roads have been constructed, making it easy for people and goods to move from one place to another. It has brought green veldts and gardens in Bamenda, thereby protecting the environment.

Nevertheless, the negative impacts are being noted for recording drastic effects on the environment. The desire to live in Bamenda has led to population growth, pushing many to settle in risk zones like the Sisia, Mulang, and Below Foncha neighborhoods. The cutting down of trees for human settlement is causing severe flooding, leading to material and property damage. All this has contributed to climate change, with increasing temperatures. Bamenda used to be very cold in the past, but today it is very hot both during the day and at night. With population growth, waste management is an issue. Waste is discarded at road sites, streets, and rivers, hence leading to water pollution and environmental degradation.

6. Conclusions

The mutation of architecture in Bamenda has significantly impacted the cultural, social, economic, and environmental landscape of the Northwest Region of Cameroon. The interplay between traditional and modern architecture has shaped urban identity, influencing the way people live, work, and interact with one another. Our results indicate that the dynamics in architecture have brought the following impacts (social, economic, cultural, and environmental impacts). So many schools, roads, markets, health units, and travel agencies have been constructed in Bamenda, facilitating mobility and social cohesion. Landlords have built houses and are earning income from them through rents. The culture of the Bamenda people is fast disappearing as ritual sites are turned into dumping grounds. The falling of trees for construction has also resulted in flooding and landslides. Consequently, the transition in architecture in Bamenda has had both negative and positive impacts. The reason modern architecture has brought new opportunities for economic growth and development is that it has also led to the loss of traditional cultural practices and the homogenization of architectural style. We have examined the impacts of architectural mutations in the Bamenda Northwest Region, Cameroon, without mentioning adaptation strategies. So, further research could be conducted on measures to mitigate the impacts of architectural dynamics in Bamenda.

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Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent

Detailed information about the study's nature and purpose was provided, and prior approval and consent were obtained from all participants.

Competing interests

The authors declare no competing interests.

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