# Urban Growth and Quality of Life: Multicriteria Analysis of the Process and Its Impacts Case Study of the City of El Eulma

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**Abstract:** Modern cities face multiple challenges that will impact the future of the growing urban population. The COVID-19 pandemic has highlighted the weaknesses of the current urbanization model, often based on high density, which facilitated the spread of the virus.At the same time, sustainable development has led to a new urban approach aimed at balancing the social, economic, and environmental dimensions in the planning and design processes of cities. The goal is to improve the quality of life in urban areas and address the challenges faced by cities worldwide. The concept of quality of life is broad, and its meaning varies by country due to disparities in development between advanced and less developed societies. These differences are particularly evident through evaluation criteria such as housing, services, employment, security, and more.In this article, we study the urban growth of the city of El Eulma (Wilaya of Sétif) and its impacts on the quality of life of its residents. Our methodology emphasizes a morphological approach to analyze the urban growth model of the city, and a multi criteria analysis to measure the urban quality of life of its inhabitants.

**Keywords**: quality of life - sustainable city - urban environment - sustainable development

## Introduction

Cities of the 19th century, particularly in developing countries, face major challenges related to urbanization, encompassing social, environmental, and urban planning concerns. These challenges have a direct impact on the well-being of urban residents. According to projections from the United Nations, global urbanization will experience rapid growth, with an urbanization rate reaching 54% by 2030, and 60% of this urban population residing in developing countries. (1)

These countries are facing an unprecedented urban phenomenon, which may prove insurmountable given their capacity to cope with it (G. Burgel, 1993). According to P. Bairoche (1996), developing countries are experiencing "urban inflation," meaning that the urbanization in these countries does not stem from economic development, as

is usually the case, and does not benefit the living conditions of the population (access to housing, water, air pollution, etc.). Moreover, continuous urban growth through sprawling built-up areas is largely responsible for the urban challenges in these countries. The advent of sustainable development struggles to rectify the situation, despite the new requirements it has introduced in urban planning. It appears that making a city through compromises is the central issue of the sustainable development approach.

However, this approach, which is considered democratic and responsible, highlights new challenges in urban planning, particularly concerning the consistency of investments needed to improve the living conditions of urban residents, especially in developing countries

The city of El Eulma, a medium-sized city in Algeria, is not exempt from this issue. It is experiencing rapid urban growth, following a hybrid growth model. This growth primarily results from private investment (commerce, housing), but also from public policies (infrastructure, housing). We observe a dual logic of urban formation, which we might describe as antagonistic, when focusing on the means and ends of these two modes of intervention. This occurs sometimes despite existing regulations. The challenge of this model lies in the adopted urban forms and their environmental and sociocultural implications. It is to these challenges that our work will seek to respond.

## 1. Methodology

Our question, "What impact does urban growth have on urban quality of life?" concerning the causal links between urban growth and quality of life in the city of El Eulma, requires a holistic, transversal, and multidimensional approach. Thus, we have chosen multicriteria analysis (MCA) as the appropriate method to understand the phenomenon of urban growth in its entirety. Regarding the techniques and tools for development, we have favored on-site observation as well as the implementation of an online questionnaire composed of a series of evaluation indicators and syntheses. The processing of the collected data was carried out using ARCGIS.

### 1.1. The Representative Sample

As a sample, our study focuses on two neighborhoods: Maziyan Saou and Houari Boumediene. The first neighborhood consists of 150 collective housing units, housing around 750 ($^{2}$) residents, while the second comprises 250 individual villas, accommodating approximately 1,750 ($^{3}$) residents.

### 1.2. The Choice of Indicator

By definition, an indicator, according to the Larousse dictionary, is: "a device or instrument used to provide indications or information about the value of a quantity." This means a reference tool (standards-criteria-laws, etc.) for measuring and evaluating an observed and observable reality in order to draw conclusions. According

to Gilles Sénécal et al. (2005), an indicator is: "first and foremost a simplification of complex phenomena, constructed to illuminate a structure of interactions between the different components of a system or ecosystem." It can involve methods or means that allow us to understand and explain realities whose constitution and functioning involve multiple elements. Moreover, the diversification of indicators allows for a comprehensive understanding of complex realities.

In order to assess urban quality of life, many indicators have been explored and utilized, depending on the countries and the objectives of the study. However, the choice of indicators is always fraught with subjectivity, which is where the difficulty in evaluating urban quality of life lies (A. Monica, 2015). (4)

Depending on how we measure the plurality and transversality of our question as well as its conceptual ramifications, the choice of evaluation indicators has been developed by adapting the targets of the HQE2R approach, which is a verified and reputable method when addressing urban environmental issues, along with the definition of quality of life as issued by the WHO

## 2. Research

### 2.1. Quality of Life: The Difficulty of Definition

Reflection on quality of life in urban environments is rooted in a long tradition of urban thought. Since the 19th century, this issue has concerned various currents of urban planning. Cultural urbanists, such as John Ruskin, responded to the post-industrial urban crisis by advocating for a more human and aesthetic approach to the city. At the same time, hygienists like Ebenezer Howard sought to improve the living conditions of city dwellers through the introduction of nature into urban designs. In the 1960s, Kevin Lynch renewed this reflection through his work "The Image of the City," emphasizing the experiences and perceptions of citizens as fundamental parameters in the creation of urban spaces, moving away from the technocratic approach to urban planning. Overall, the notion of quality of life has often been used as a means of negative assessment of urban life (Durand and Harff, 1977). The parallel evolution of the concept of quality of life alongside urban reflections highlights the importance of residents' well-being in urban planning.

The notion of quality of life in urban environments is, in fact, polysemous. It generally refers to the various material and immaterial aspects of urban life (employment, housing, services, aspirations, expectations, etc.) (Gilles Sénécal et al., 2005, p. 2) (5). From This point, the concept of quality of life has been subject to appropriation and multidisciplinary development, further complicating its definition.

However, the definition provided by the World Health Organization (WHO) remains, we believe, the most comprehensive and relevant. According to the WHO, quality of life is: "the way individuals perceive their position in life, in the context of the culture and value system in which they live and in relation to their goals, expectations, norms, and concerns... it complexly incorporates a person's physical health, psychological

state, degree of independence, and social relationships."(6) In an urban context, this definition becomes interesting as a method for diagnosing the living conditions of urban residents, but also as a challenge given the aggregation of heterogeneous factors and conflicting interests. Indeed, Jacques Lévy and Lussault (2003) confirm this particularity of the notion of urban quality of
life, which, for them, is: "the set of material, social, and environmental living conditions that allow the inhabitants of a city to thrive and achieve their aspirations.
In summary, quality of life remains a central and ongoing issue in urban planning. It is both an indicator of the right to the city and a means for residents to exert pressure on decision-makers.

### 2.2. Quality of Life in the City: Discourse and Realities

Quality of life, or its substitute, well-being, has multiple uses. For politicians and local decision-makers, it has become a sort of political mantra aimed at potentially convincing voters during various electoral meetings. It plays an important role in the development of local strategies. For citizens, it refers to the living conditions and development within their cities. It reflects the experiences of urban residents in their environment.
However, it remains a subjective notion, despite all the objectivity it provides in explaining the quality of cities and the attractiveness of territories, as it directly depends on citizens perceptions. Thus, it represents a challenging and constraining issue to manage.
Quality of life simultaneously encompasses the spatial, social, economic, and cultural realities of a territory. In addition to this objective reality, there are the elements of representation, appropriation, and appreciation that residents have of their living space. In summary, urban quality of life cannot be reduced to a single criterion but must be understood in its entirety. It is a multitheme notion that requires an interdisciplinary and holistic approach to grasp urban reality. Conversely, a fragmented approach could fail to accurately reflect this reality, thus distorting urban policies. In Algeria, quality of life in cities is a fundamental element of urban policies. This interest is manifested through consultation and participation of various stakeholders and civil society in the development of urban strategies, as enshrined in the current urban legislation (Law 90-29). In other words, in addition to normative and regulatory mechanisms, the aspirations and perceptions of different stakeholders form the foundation of urban development projects.

### 2.3. Sustainable Urbanism and Quality of Life

#### 2.3.1. The Solution-Challenge ?

The introduction of sustainability principles into urban thinking, since the Earth Summit held in Rio de Janeiro in 1992 and confirmed by the Aalborg Charter in 1994, aims to protect natural and urban ecosystems, and by extension, to improve the living

conditions of city dwellers. According to Pierre Merlin (2015), sustainable urbanism involves integrating the social, environmental, and economic principles of sustainable development into urban designs. This approach, he argues, serves the goal of creating a more ecologically sound, economically productive, and socially equitable urban life.
However, sustainable urbanism, as a new approach, faces situations of non-acceptance. The realization of the Sustainable Development Goals (SDGs) in urban planning requires the commitment of all stakeholders. However, finding compromises between stakeholders with conflicting interests is the main challenge of the entire process. This situation is even more constraining in developing countries, which lack financial and technical resources and face rampant and informal urbanization. According to an article published by Euronews on September 21, 2023, the realization of the Sustainable Development Goals (SDGs) is occurring at a pace deemed inadequate, including among developed countries.
Algeria, being a developing country, is not exempt from this situation. The country, like all signatory nations of the Rio de Janeiro declaration, committed itself in 1994 to implementing the resolutions of this declaration. However, the dual security and economic crises that hit the country hard, coupled with rapid urbanization caused by rural migration to urban centers and the emergence of informal settlements, along with the financial restrictions imposed by the IMF's structural adjustment plans, led to a failure of this commitment. After a decade of multifaceted crises, informal urbanization has expanded, and despite the efforts made and facilitated by financial improvements, urban quality of life remains unfavorable, particularly in the informal neighborhoods that emerged during this crisis period.

### 2.3.2. Towards the Humanization of the City

the ultimate goal of sustainable urbanism is to reconnect with the human qualities of cities of the past, prior to urbanization, as explicitly stated by Jane Jacobs in her book The Death and Life of Great American Cities, published in 1961. By "human qualities," we mean the creation of living conditions that promote the well-being of urban residents. This approach aims to be corrective, after observing alarming thresholds of socio-spatial disparities in cities. It seeks to address the negative impacts of industrial and, later, capitalist cities, which have sometimes dehumanized urban spaces. Sustainable urbanism thus takes on the mission of putting humans back at the heart of urban development. It aims to design urban environments that are more equitable, inclusive, and conducive to the flourishing of populations by integrating social, environmental, and economic dimensions. Beyond merely technical aspects, sustainable urbanism seeks to restore a soul and human dimension to cities, following a period of urban development deemed contrary to the aspirations of city dwellers. This is a major challenge for recreating an urbanity that fosters coexistence.

According to H. Bérubé and O. Chatelan (2017), referencing the UNESCO report of 1996, the humanization of cities involves three key elements: First, the "right to the city" as defined by Henri Lefebvre (1972): "the right to renewed centrality, to places of meeting and exchange, to rhythms of life and schedules that allow for the full and complete use of these moments and places." Second, the consolidation of participatory governance, meaning the democratization of urban management to involve residents more in decision-making processes. Third, the strengthening of active solidarity through the creation and development of urban spaces that foster social relations, urbanities, and reduce disparities. These three components are closely linked to the urban form of the city and are essential elements for humanizing urban spaces. In other words, the humanization of cities involves recognizing the rights of citizens, democratizing the city, and strengthening social ties, within a cross-cutting approach to urban planning.

## 3. Applications

### 3.1. El Eulma: A Pole City

The city of El Eulma, the district capital, occupies an important position in the urban system of the Wilaya of Sétif and also in eastern Algeria. It is located in the High Plains of Sétif. It is the second largest city in the Wilaya, with an area of approximately 1986 hectares. In the Algerian nomenclature, the city of El Eulma is classified among the major upper urban cities, with an urbanization rate estimated at 94% in 2021(7), higher than that of the mother city of Sétif, which stands at 88%. Its population is estimated at 227,126 residents in 2021, representing 66% of the urban population of the mother city of Sétif and 19% of the total urban population of the Wilaya

The cities of El Eulma and Sétif together account for 49% of the total urban population of the Wilaya and approximately 29% of the total population of the Wilaya. Its strategic location grants it the status of a regional and national crossroads city. Its socioeconomic importance has been further strengthened by the East-West Highway, which crosses it over a distance of about 10 km. Today, it serves as a major commercial hub, with its area of influence extending to neighboring countries such as Tunisia and Libya. Additionally, the railway connecting Constantine and Algiers makes El Eulma a vital transportation node in the northeast region of Algeria.

Moreover, the city of El Eulma is experiencing sustained economic and urban dynamics, with its development and urbanization following a progressive trend. Its diversified commercial base of goods (wholesale and retail) serves as its main socioeconomic catalyst, making El Eulma an attractive hub for local and regional employment.

This economic dynamic and the resulting urban growth will undoubtedly provide the city with more urban amenities, various socioeconomic benefits, and likely a favorable quality of life due to the urban infrastructure and services it enjoys

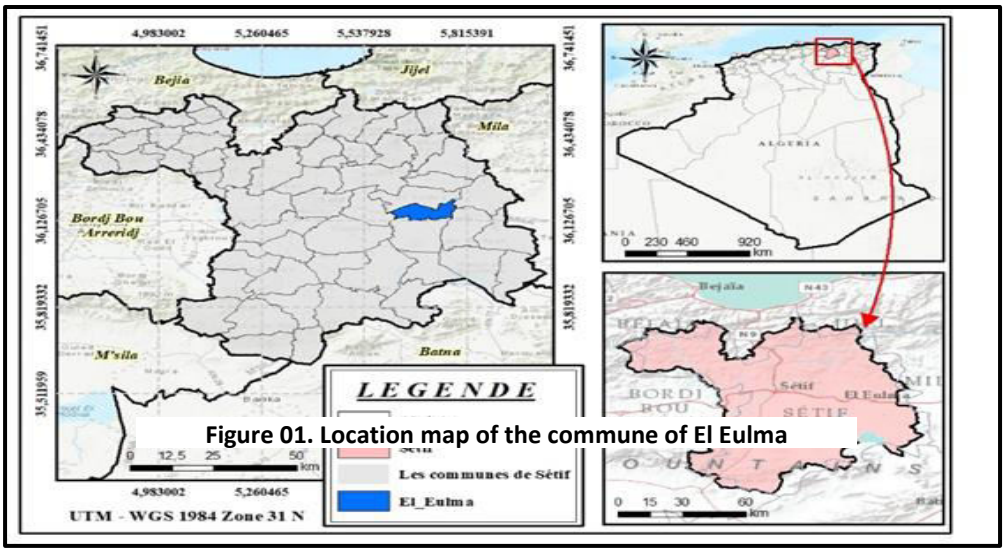



Figure 01. Location map of the commune of El Eulma

## 3.2. El Eulma: an accelerated and hybrid urban growth

### 3.2.1. Genesis and Development

The city of El Eulma emerged around a small group of 40 traditional houses near a water source, "Aïn Tfetika," in an agricultural region. In 1862, it became a settlement center and was officially designated as such in 1875 by decision of the French governor. Europeans settled there for military reasons, taking advantage of its altitude for defense and its strategic position for communications. El Eulma has undergone significant transformations influenced by demographic growth, political and administrative promotion, as well as economic and real estate dynamics. Its location on National Road No. 5, connecting the capital to eastern Algeria, has also facilitated its development.

The city is built from the ground up, primarily consisting of self-constructed homes (villas) (Fig. 02). Self-constructed homes represent 74.91% ([8]) of the housing stock in the city, while housing developed under public policies accounts for barely 25.09%. This means that urban growth is driven both by residents and public institutions. In fact, the built area occupied by self-constructed homes is estimated by us to be 87.30% of the total area of the city.

Moreover, this form of growth reflects the economic well-being of households on one hand, and on the other, their strategic preference for individual homes that are more conducive to commercial activity. Indeed, these homes are designed with multiple floors (R+2, R+3, etc.) and are generally inhabited by a single family, which can be identified as an extended nuclear family (several households). In their design, self-constructed homes are intended to serve both residential and commercial functions, with the ground floor being commercial while the upper floors are residential.

**Figure 02: Example of self-constructed homes**


**Source: Photos taken by doctoral candidate Aya Hama.**

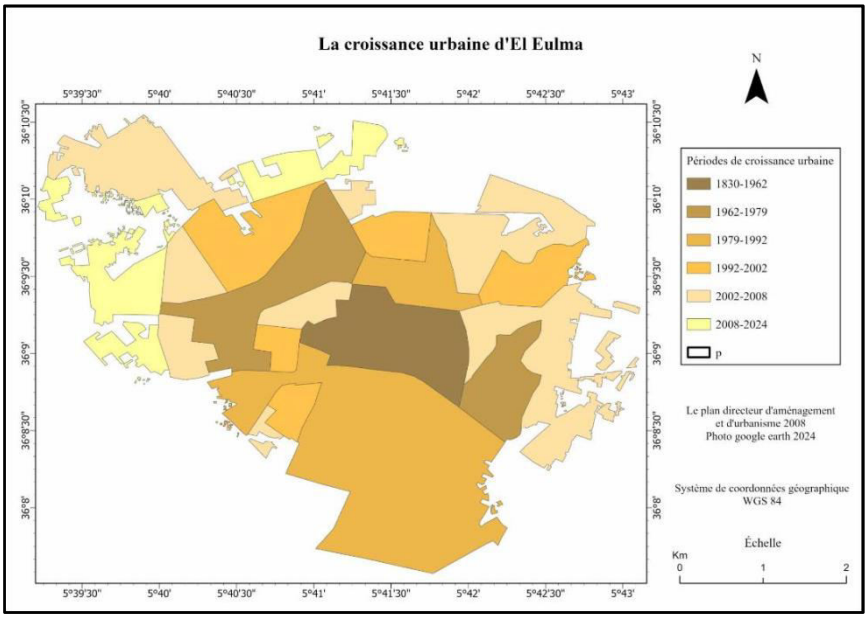



Figure **Fehler! Verwenden Sie die Registerkarte 'Start', um o dem Text zuzuweisen, der hier angezeigt werden soll.** : croissance urbaine de la ville d'El Eulma 1962-2024

### 3.2.2. Combined Urban Growth: Sprawl and Densification

The city of El Eulma has experienced multifaceted spatial growth at varying rates. It has simultaneously combined growth through sprawl and densification of its urban fabric (Fig. 03). Its residential density is 114.4 inhabitants per hectare, three times higher than that of its municipality, which is 33 inhabitants per hectare. The site's topography and the legal nature of the land have been conducive to continuous expansion, despite the negative impacts on the landscape (continuous built masses) and microclimate due to the emergence of urban heat islands. The evolution of land consumption over time can reveal both the rate and the form of spatial growth the city has undergone.

The rate of spatial growth of the city of El Eulma is indicated by (ā) (9); the average annual growth rate, whose application is analogously generalized to cover several domains (financial, demographic, etc.), with the formula being:

$$\bar{a} = \sqrt[T]{\frac{St}{S0}} - 1$$

**Where:**

- a¯: average annual growth rate
- St : value/measurement of land consumed at time t,t+1,t+2t, t+1, t+2t,t+1,t+2
- So: value/measurement of land consumed at time 000
- T: interval (in number of years) between the two measurements

**Table 1: Results of the Application of the Indicator ā**

| Periods | Consumed area (hectares) | Average annual growth rate of consumed land (ā). |
|---|---|---|
| **Before 1962** | 86 | **Reference period** |
| **1962 _ 1977** | 176 | **05 %** |
| **1977 _ 1987** | 735 | **15 %** |
| **1987 1998** | 1050 | **04 %** |
| **1998 _ 2008** | 1473 | **03 %** |
| **2008 _ 2024** | 1986 | **03%** |

Source: the authors 2024.

The results obtained for the indicator **(ā)** show varied and different rates of spatial growth. We deduce four (04) essential periods, namely:

- **Period of Strong Urban Growth (1962-1977)**: Just after independence, the locals reclaimed their lands that had been taken by colonizers, and a significant rural exodus towards cities and urban centers was recorded, resulting in the emergence of new neighborhoods.
- **Period of Moderate Growth (1977-1987)**: This period coincides with a decrease in the rural exodus phenomenon, as well as the adoption of collective housing as an urban development model known for its reduced land consumption.
- **Period of Socioeconomic Stagnation (1987-1998-2008)**: This period coincides with the dual security and political-economic crisis that affected the country,

resulting in a significant decrease in public investment, particularly in housing and infrastructure. Conversely, it was the large cities that experienced migration flows from the rural areas

- **Period of Urban Renewal and Revitalization (2008-2024)**: With the financial upturn the country experienced starting in 2004, the authorities quickly initiated major socioeconomic upgrading and urban development projects. The city of El Eulma benefited from a significant urban hub, consisting of several hundred collective housing units, which explains the low rate of urban land consumption.

### 3.2.3. Quality of Life: Reality and Citizen Perceptions

The evaluation of quality of life in El Eulma is based on a methodology using multi-criteria indicators inspired by the HQE2R approach. It includes five main indicators and fifteen sub-indicators, as shown in table n°3. This choice aligns with the WHO's definition of quality of life, aiming to cover all aspects affecting urban residents' lives. The goal is to provide a comprehensive assessment that can guide urban policies and improve local living conditions

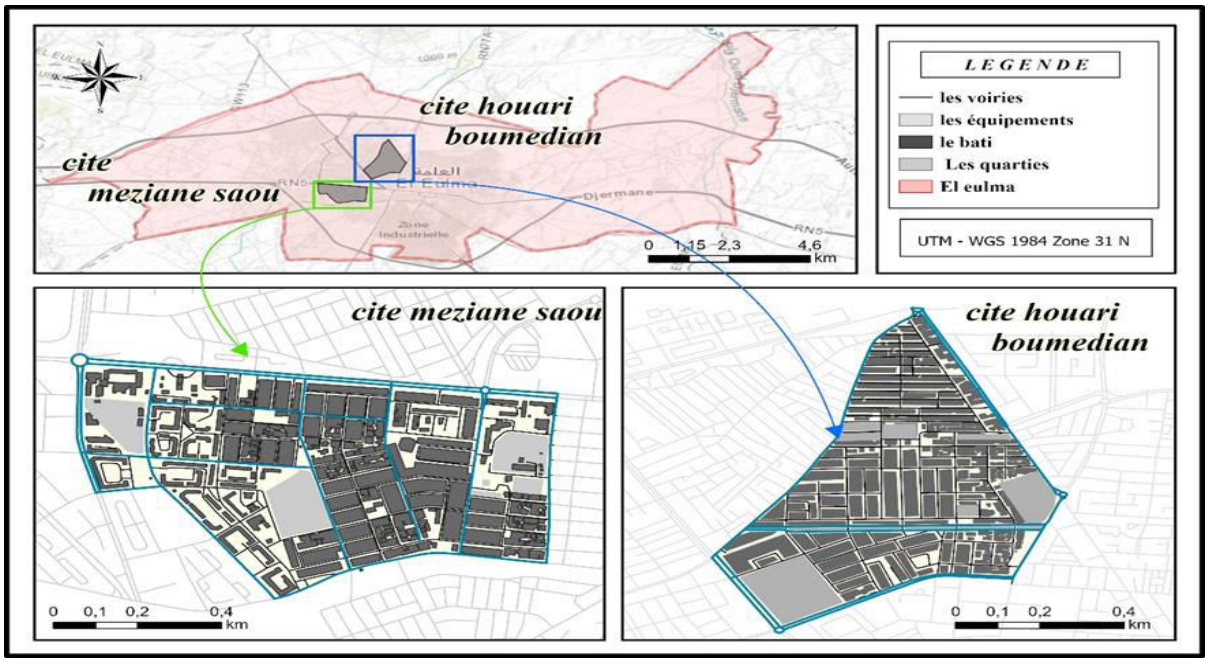
- **Definition of the sample size**

For a 95% confidence level and a 5% margin of error, the required sample[10]size for each neighborhood is approximately 255 and 316 responses, to be achieved by distributing 319 and 395 questionnaires, respectively.

- **Technical sheet of the selected neighborhoods**

The analysis was conducted in the neighborhoods of Houari Boumediene and Maziyan Saou. These two neighborhoods have essentially different characteristics (Table n°2) in terms of sociodemographic aspects, typology, and the functions they host. The Meziane Saou neighborhood is located in the western part of the city, while the Houari Boumediene neighborhood is situated in the northern part (Fig. 04). Both neighborhoods are close to the historical core of the city.

**Figure 04: Location of the two neighborhoods.**



Source: the authors 2024

**Table 2: Characteristics of the Analyzed Neighborhoods**

| **Neighborhood** | **Typology** | **Number of housingunits** | **Number of inhabitants** | **Area (ha)** | **Gross density** hou/ha |
|---|---|---|---|---|---|
| MaziyanSaou | Public Collective | 150 | 750 | 1,875 | 80 |
| Houari Boumediene | Individual Self-Built | 250 | 1750 | 10,83 | 30 |

Source: the authors 2024

**Table 3: Results of the application of evaluation indicators**

| **Neighborhoods** | | **MEZIANE SAOU** | | | **HOUARI BOUMEDIENE** | | |
|---|---|---|---|---|---|---|---|
| **Indicators** | **Sub-indicator** | **YES** | **NO** | **OBS** | **YES** | **NO** | **OBS** |
| Improve the quality of the local environment. | Improvement and coordination of the site with visual comfort | 120 | 135 | **NR** | 36 | 280 | **NR** |
| | Improvement of housingefficiency | 98 | 157 | **NR** | 179 | 137 | R |
| | Improvement of cleanliness and health | 75 | 180 | **NR** | 86 | 220 | **NR** |
| | Improvement of security and risk managemen | 200 | 55 | R | 218 | 98 | R |
| | Reduction of waste and noise | 108 | 147 | **NR** | 98 | 218 | **NR** |
| Preserve and enhance heritage and conserve resources | Preserve and enhance built and natural heritage | 92 | 163 | **NR** | 262 | 54 | R |
| | Improve water resource management and its quality | 170 | 85 | R | 125 | 196 | **NR** |
| | Prevent urban sprawl and improve space management | 161 | 94 | R | 16 | 300 | **NR** |
| Improveintegration. | Environmentallyfriendly transportation infrastructure | 76 | 179 | **NR** | 133 | 183 | **NR** |
| | Enhance the neighborhood's attractiveness by creating living and meeting spaces for all city residents | 45 | 210 | **NR** | 184 | 132 | R |
| Improvediversit | Ensure diversity of functions (economic/social) | 116 | 139 | **NR** | 221 | 95 | R |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| y | Diversity in housing | / | 255 | R | 223 | 93 | R |
| | Diversity in employment | 255 | / | R | 211 | 105 | R |
| Strengthen social ties | Strengthen social cohesion and participation | 169 | 86 | R | 237 | 79 | R |
| | Improve solidarity networks and social capital | 108 | 147 | **NR** | 227 | 89 | R |
| **R**:realized**NR**: no realized | | | | | | | |

Source : the authors 2024

### 3.2.4. Weighting

To enhance the visibility and objectivity of the perceptual reactions (results obtained above), which, despite their objectivity, remain partially subject to subjectivity, we proceeded to weight these results according to the multi-criteria matrix. The allocation of weighting coefficients by indicator (table n04) was determined based on the importance of each indicator in society.

**Table 4 : Results of Weighting**

| **Criteria** | Coeff | **Meziane Saou** | | **Houari Boumediene** | |
|---|---|---|---|---|---|
| | | Score | Weighted | Score | Weighted |
| Strengthen social ties | **4** | 1 | 4 | 2 | 8 |
| Improvediversity | **3** | 2 | 6 | 3 | 9 |
| Enhanceintegration | **1** | 1 | 1 | 1 | 1 |
| Preserve and enhance heritage and conserve resources | **2** | 2 | 4 | 1 | 4 |
| Improve the quality of the local environment | **5** | 1 | 5 | 2 | 10 |
| **Total** | | | **20** | | **31** |

Source : the authors 2024

## 4. Discussion of Results

The Houari Boumediene neighborhood, primarily composed of self-constructed housing, offers a better quality of life, as these homes, designed by the residents themselves, are better suited to their aspirations and needs. In fact, more than two-thirds (2/3) of the city's housing stock is self-built. However, cleanliness is an issue in both neighborhoods. In Houari Boumediene, this lack of cleanliness is mainly due to intense commercial activity, while in the Meziane Saou neighborhood, the proliferation of waste results from ineffective collection mechanisms, exacerbated by

residents' indifference, partly linked to their low level of involvement. In contrast, the residents of Houari Boumediene demonstrate a greater attachment to their neighborhood, particularly through the preservation of built heritage.

In terms of urban growth, self-constructed housing, while meeting residents' needs, contributes to urban sprawl, which has negative consequences for quality of life. This sprawl increases local temperatures due to construction density and degrades urban aesthetics because of the heterogeneity of built forms. Such growth leads to various inconveniences. Functionally, the Houari Boumediene neighborhood stands out for its mixed-use, combining residential and commercial spaces, enhancing its attractiveness, socio-economic diversity, and job creation capacity. In contrast, the Meziane Saou neighborhood is characterized by functional monotony, limited to purely residential use.

Finally, regarding social ties, although significant progress has been made in both neighborhoods, it's important to note that solidarity and sociability among neighbors remain fundamental pillars of Algerian society. In self-constructed neighborhoods, social connections are stronger than in other areas.

## 5. Conclusion

The results highlight that the quality of life within a local environment depends on several interdependent factors, including:

- The type of housing,
- The socioeconomic status of residents and their sociocultural psychology,
- The perception and appropriation of outdoor spaces,
- The legal nature of spaces (private, semi-public, or public), which influences how residents interact with their environment, as well as variables like time spent in these spaces, gender, education level, and individual experiences

It is crucial to recognize that evaluating quality of life must take into account the diversity of contexts, as it varies based on the specific characteristics of each neighborhood and its residents. For example, in a self-constructed housing neighborhood, residents' involvement in designing their environment enhances their sense of belonging, positively influencing their perception of quality of life. Conversely, in neighborhoods where residents have had little to no input in space design, a sense of detachment may arise, negatively impacting quality of life.

Quality of life encompasses not only material conditions but also the ways in which users participate in the construction and evolution of their environment. This involves co-responsibility in managing spaces and active citizen engagement in urban governance processes. As an indicator of this involvement, quality of life allows for the assessment of governance systems' ability to meet residents' needs while considering local specificities.

However, the question remains: does a standardized definition of quality of life truly allow for the evaluation of the complexity and diversity of urban realities? The richness and nuances of urban life cannot easily be reduced to a single set of criteria, as each neighborhood, social group, and individual has different perceptions and needs. A more flexible and contextual approach is necessary to better reflect the realities of cities and neighborhoods and to more accurately define what constitutes a "good quality of life" in complex and heterogeneous urban environment.

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