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Nature, Architectural Composition, and Human Well-Being: A Case of a Contemporary Garden in Setif, Algeria

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Abstract: The present study focuses on exploring users' aspirations within urban green spaces, with a particular emphasis on the "July 5, 1962 Garden" located in Setif, Algeria. The main objective is to identify the diverse functionalities of green spaces and provide practical and effective recommendations to enhance the appeal, functionality, and usability of the selected garden while considering the needs and desires of the community. The study employs a cross-reading approach to achieve its objectives, combining a participatory survey on a digital platform with qualitative analysis. By synthesizing various approaches, including morphological, historical, functional, sensory landscape, and anthropo-spatial analyses, the study gains insights into the garden's current state, historical significance, functionality, sustainability, and impact on visitor well-being. Additionally, a unique "witnessing survey" strategy is used to gather detailed information, addressing gaps in prior research and limited available data. This approach provides firsthand accounts and witness descriptions, contributing to the study's originality. The study's in-depth analysis highlights the garden's role as a biological facility, promoting biodiversity and well-being. It offers a relieving microclimate, enhancing safety in urban neighborhoods. Urban planning is harmony and coherence that optimize the link between nature, design, and human well-being, creating eco-friendly environments that positively affect residents. The "July 5, 1962 Garden" significantly enhances the community's quality of life, serving as a recreational space and fostering biodiversity. Prioritizing green spaces in urban planning is crucial for well-being and sustainability, benefiting both the environment and inhabitants.

Keywords: green spaces, sustainability, participatory approach, digital, witnessing survey, well-being, Setif

1. Introduction

The interaction between urban space and nature is a critical aspect of contemporary discussions on urban sustainability. With the impact of climate change, green spaces have gained significant importance due to their multifaceted functions. In line with the concept of a sustainable city, urban natural spaces hold value both in terms of habitability and as economic resources. Landscape architecture plays a pivotal role in constructing cities as it directly influences the relationship between humans and nature. The quality of this interaction should be evaluated as a cultural and civilizational criterion [1].

Contemporary challenges have fostered a culture that emphasizes leisure activities. This growing notion has become an economic driver, generating job opportunities. Aligning leisure with nature can meet the needs of urban populations seeking a reconnection with the natural environment. Gardens, in this context, contribute to the “renaturation” of cities. Montero [2] defines gardens as the essential connection between individuals and nature, a balance between the enclosed interior and the vastness of the exterior that leads to happiness. Furthermore, the term “garden” refers to a piece of land, often enclosed, where useful plants (vegetables, fruit trees) or ornamental plants (flowers, ornamental shrubs) are cultivated. According to the Charter of Florence [3], a garden is an architectural composition primarily comprised of living, perishable, and renewable vegetal materials. There are two main types of gardens: the regular garden, characterized by symmetry imposed on a tamed nature (such as the Italian garden of the Renaissance and the French garden of the 17th century), and the landscape garden, which replicates the picturesque beauty of diverse natural landscapes (like the English or “Anglo-Chinese” garden of the 18th and 19th centuries). Green spaces, including gardens, play a crucial role in biodiversity and the environment. Besides providing relaxation and recreational spaces for residents, gardens are often rich in visible biodiversity. They serve as habitats for plants, insects, birds, and mammals, contributing to urban biological diversity.

Describing the city of Setif, Madani [4] highlights its potential to be a healthy and ecological city due to factors such as a dry climate, high plains location, and cleansing winds. The law pertaining to the management, protection, and development of green spaces establishes objectives to improve the urban living environment, maintain and enhance the qualities of existing green spaces, promote the expansion of green areas in relation to built-up regions, and make the inclusion of green spaces mandatory in both public and private urban planning and architectural studies [5]. During the period between 2007 and 2011, the municipality demonstrated an active commitment to green spaces in Setif, resulting in the creation of the contemporary garden known as “July 5, 1962 Garden” near the Tlidge neighborhood (TN). Examining this garden allows us to comprehend the true significance of reintegrating nature into urban settings and determine if this emphasis on providing more space and visibility to nature contributes to the urban reconquest of open spaces. These wastelands are often regarded as residual and marginalized areas detached from the rest of the city. Henceforth, empty spaces (zero problems, zero risks, and undefined spaces) are seen as desirable locations for diverse ecological purposes [6].

A change in perception is underway, acknowledging the adverse consequences of urban sprawl. A new sustainability paradigm emphasizes the value of compact, connected cities that contribute to environmental, social, and economic realms. Consequently, strategically located brownfields, well-served by public transport infrastructure, present an opportunity to rebuild neighborhoods sustainably. Brownfields and abandoned sites offer open and available spaces within the city, encouraging experimentation with multiple uses [7]. Integrating green spaces into neighborhoods can be seen as a catalyst for the city’s sustainability. Lastly, ensuring access to green spaces and a healthy environment for all raises fundamental questions about the design and function of gardens for the benefit of neighborhood inhabitants. Furthermore, this research utilizes the cross-reading methodology, combining qualitative analysis and a survey approach to thoroughly investigate different aspects of the garden. A participatory approach involving stakeholders and a digital platform survey complement field observations. The study employs five distinct approaches: morphological, historical, functional, sensory landscape, and anthropo-spatial, to conduct a comprehensive analysis of the case study, providing valuable insights into the garden’s importance, development, usability, sensory qualities, sustainability, and impact on the community.

2. Methodology

This research work adopts a comprehensive methodology to investigate the role of green spaces in urban environments and their contribution to sustainable urban development. The methodology encompasses a range of approaches and tools to gather data, analyze relevant literature, and engage with the community (see Figure 1).

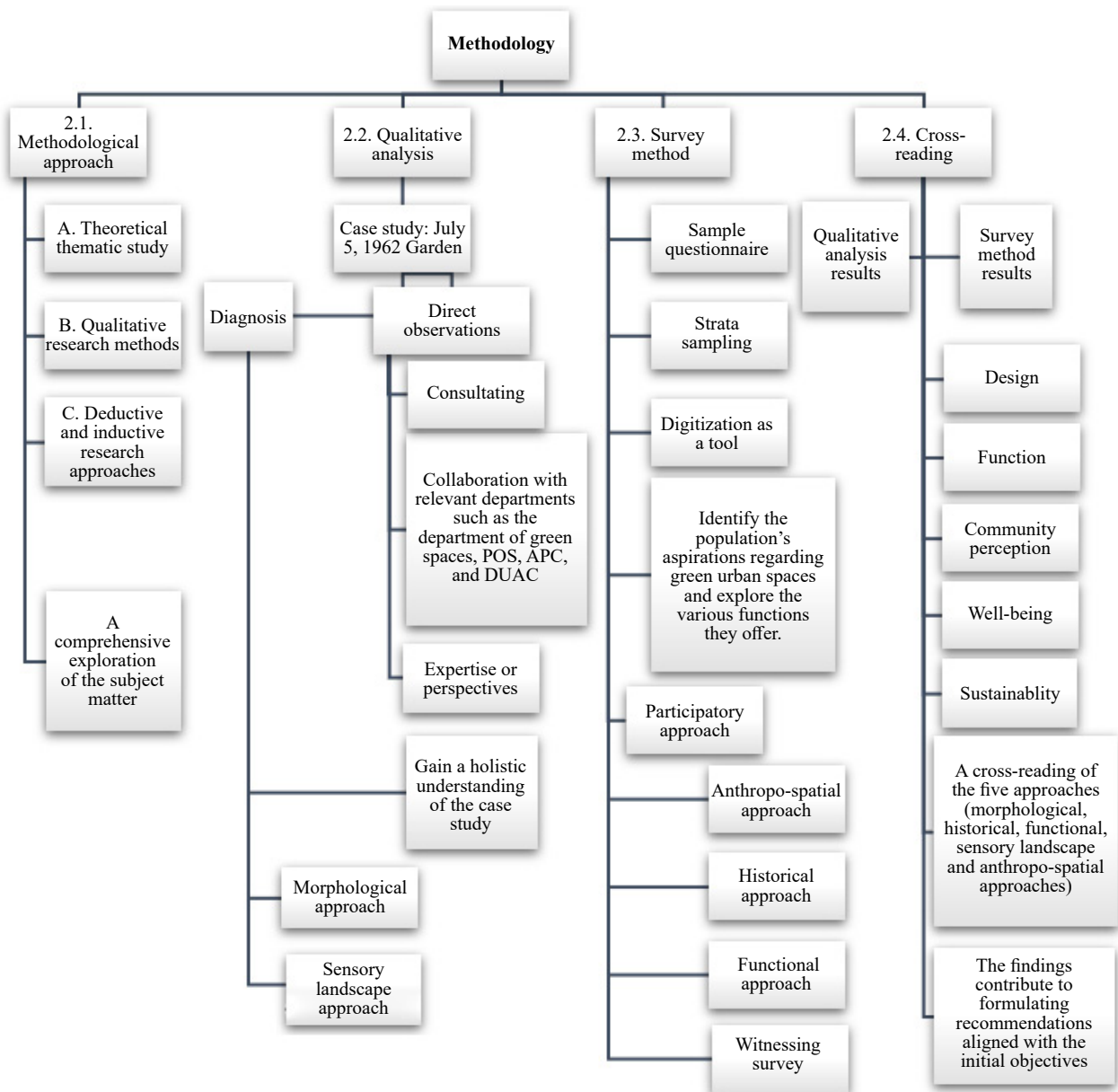


Figure 1. Explanation of the selected methodology. Note: APC = Assemblée Populaire Communale; DUAC = Direction de L'urbanisme, de L'architecture et de la Construction; and POS = Plan occupation des sols (land use plan)

2.1 Methodological approach

The research employs a mixed-methods approach that combines qualitative and quantitative research techniques. This approach allows for a comprehensive exploration of the subject matter, providing both insights into individual experiences and a statistical analysis of broader trends. The methodology encompasses the following key components:

- Theoretical thematic study:** A thorough review of existing literature is conducted to establish a theoretical foundation for the study. This review focuses on understanding the functioning and dysfunction of gardens, as well as the impact of design on their use. By examining relevant scholarly articles, books, and reports, the study aims to gain a comprehensive understanding of the topic.
- Types of research based on the kind of data:** Qualitative research methods are employed to gain insights into participants' experiences and perspectives, while quantitative research methods are utilized to test theories and

- make predictions. These methods are employed in a complementary manner to provide a well-rounded analysis.
- c. Types of research based on the kind of inference: Both deductive and inductive research approaches are used. Deductive research is employed to test existing theories or hypotheses and draw conclusions based on empirical evidence. Inductive research, on the other hand, focuses on developing new theories or hypotheses based on observed patterns and accumulated concepts.

2.2 Qualitative analysis

The primary research approach centers around an operational strategy based on a participatory approach. This includes conducting a survey on a digital platform and making a diagnosis based on field observations. The survey aims to examine the current state of the green space, including its composition, history, functioning, and visitor patterns. Additionally, the study explores the sustainability of green space and its connection to urban development. The research methodology is reinforced by utilizing a documentary and bibliographical method, along with data from relevant departments such as the Department of Green Spaces (Setif), Department of Urban Planning (Setif), Cadastral Department, APC (Communal Popular Assembly [Municipality]), and DUAC (Department of Urban Planning, Architecture, and Construction).

The methodology incorporates a study of similar foreign experiences, allowing for a comparative analysis of foreign, national, and local examples to extract utopian and operational insights. A site analysis is conducted, involving the observation and critical evaluation of the space and various local urban planning tools to assess the design and landscape composition of the garden in relation to the initial objectives. The interpretation and synthesis of the obtained results are used to formulate recommendations toward achieving the initial objectives. Two distinct approaches are employed to analyze the case study comprehensively:

- a. Morphological approach: This approach focuses on the physical form and layout of the green space, examining its spatial organization, structures, and elements. It explores how the morphological characteristics of the garden shape its functionality and user experience [8].
- b. Sensory landscape approach: Considers the sensory experiences and perceptions evoked by the garden. It explores how the design elements, vegetation, and ambiance of the green space shape users' sensory experiences, such as sight, sound, smell, and touch [9].

By employing these cross-reading approaches, the research aims to gain a holistic understanding of the case study, uncovering the interplay between different factors and phenomena that influence the success and sustainability of green space.

2.3 Survey method

Initially, we endeavored to interview more than 100 people as a questionnaire sample, but only 32 people actually responded. To ensure a representative sample, the sampling method employed was strata sampling, which helped determine the population to be interviewed. The survey was conducted on a digital platform via digitization as a tool, using Google Forms in combination with social networks. Specifically, Facebook pages dedicated to the inhabitants of the TN (formerly known as Bon Marché) and the pages of Setif city residents were utilized. The objective of the survey was to determine the relationship between “citizen-green space” and better understand the value placed on the natural element in the neighborhood as a biological support. The survey aimed to identify the population's aspirations regarding green urban spaces and explore the various functions they offer. Three distinct approaches are employed to analyze this relationship:

- a. Anthro-spatial approach: Focuses on the interaction between people and space, emphasizing the social and cultural dimensions of the garden. It investigates how green space contributes to a sense of place, community identity, and social cohesion [10].
- b. Historical approach: Delves into the garden's past, studying its evolution, changes, and historical significance. It investigates how historical factors and events have influenced the design, development, and use of green spaces [11].
- c. Functional approach: Examines the intended and actual functions of the garden. It analyzes the activities and services provided by the green space, assessing its ability to meet the needs and aspirations of the

community [12].

The study employs an innovative “witnessing survey” method [13], and its adoption is motivated by the absence of prior research and the limited data available on this specific case. This unique survey approach is deemed essential for filling knowledge gaps and obtaining firsthand accounts and witness descriptions, considering it is the original work and the first study to explore such a case. By utilizing this method, the research aims to shed light on the “July 5, 1962” Garden’s various dimensions and significance, providing valuable insights into its role in promoting biodiversity, enhancing well-being, and contributing to the urban environment. The “witnessing survey” stands as a pivotal aspect of the study, allowing for a comprehensive examination of the garden and highlighting its importance in the urban context.

2.4 Cross-reading methodology

The research employs a cross-reading methodology, combining multiple approaches to comprehensively understand the history, use, well-being offerings, and sustainability of the “July 5, 1962 Garden”. By integrating qualitative analysis and a survey method, the study examines the various dimensions of the garden. A depth analysis involves a participatory approach and includes a digital platform survey and field observations. Five distinct approaches—morphological, historical, functional, sensory landscape, and anthropo-spatial—are employed to analyze the case study. Through these methodologies, the study provides insights into the garden’s design, functionality, community perception, and its ability to promote well-being and sustainable practices. The findings contribute to formulating recommendations aligned with the initial objectives.

2.5 Qualitative analysis: Urban and architectural analysis of the case study area

2.5.1 Presenting the city of Setif

The province of Setif, located in eastern Algeria on the High Plains, is approximately 300 km away from Algiers. Situated at an altitude of 1,100 m, the province covers an area of 6,549.64 km² [14].

2.5.2 Presentation of the Abderrahmane TN

The case study is situated in the southeastern part of the city. This residential area has historical significance, as it is an old district of colonial origin. The site covers approximately 20 hectares and is surrounded by the railway line to the north, west, and southwest. To the east, a boulevard bounds it.

The neighborhood follows a checkerboard plan, characterized by an orthogonal arrangement of streets and blocks oriented in the east-west and north-south directions. Known as one of the renowned residential areas of Setif, the TN (formerly known as Cité Lévy) dates back to the French colonial period and was among the first European neighborhoods constructed outside the city walls in the 1930s [4].

2.5.3 Historical overview: Birth of the neighborhood

After the First World War, the municipal authorities of Setif took the initiative to develop the TN by implementing various projects in its immediate vicinity. In order to make room for the construction of villas with gardens, an old camp known as “Negro village” or “Zmala”, located on communal land and rented to individuals from the south of the country since 1881, was demolished. This urban development program, known as “Habitat à Bon Marché (HBM)”, was aimed at providing affordable housing for the European middle class. For a clearer understanding of the urban development in Setif, it is recommended to refer to the Plan of Setif (1930) [15]. This historical map outlines the city’s transformation as it existed in 1930, shedding light on the urban planning principles of that era. Prior to this, the “Bel Air” neighborhood was established in the northwest of the city, marking the first significant expansion of Setif beyond its walls [16].

The TN as it exists today was established as a result of a decision made on June 25, 1921, to permanently remove the (Negro) village. This initiative was proposed and spearheaded by Charles Levy, who served as the Financial Delegate and Chairman of the Cooperative Society for HBM at the Setif Town Hall (see Figure 2). Levy’s vision for the neighborhood was inspired by the concept of “Ebenezer Howard’s Garden City”, which aimed to create self-contained communities that harmoniously integrated nature and urban living [15]. The Charles Lévy neighborhood (1926 to

1933) was specifically developed for the European middle class as part of the HBM program, overseen by the “Héritage Sétifien” under the leadership of Charles Lévy.

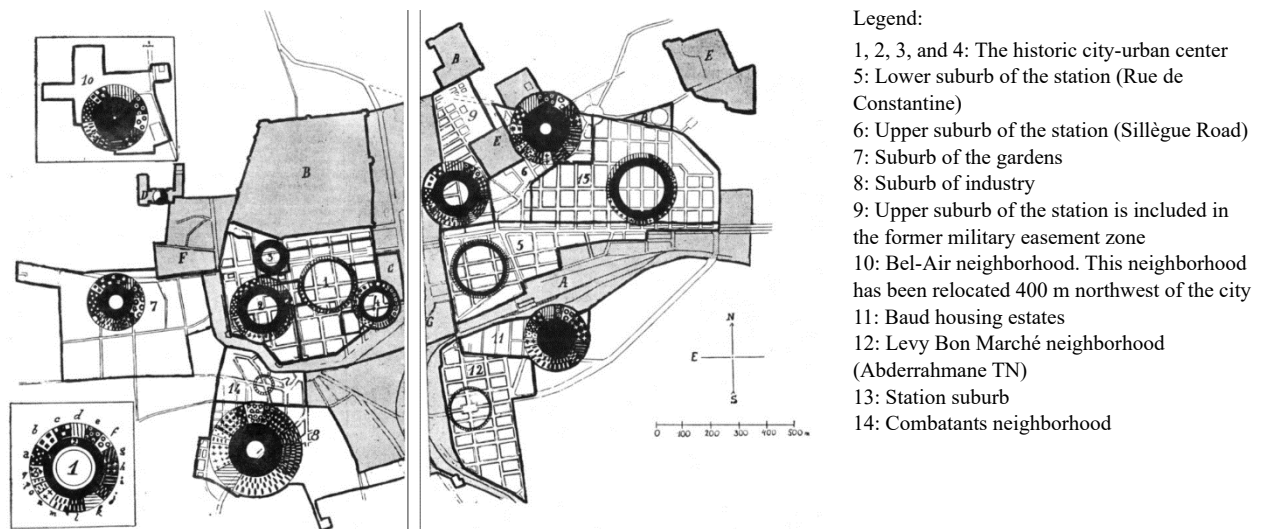


Figure 2. Map of densities and grouping by neighborhood according to the origin of the inhabitants of Setif. Scale 1:10,000 [17]

2.5.4 Evolution of TN

Post-independence period (since 1970): Figure 3(a) shows the neighborhood evolution after the period of independence, and Figure 3(b) illustrates the actual neighborhood that underwent densification and saturation of the urban space. This was a result of adding additional infrastructure, such as a school, Entreprise de Travaux Bâtiment et de Travaux Publics (ETBTP; Building and Public Works Construction Company) offices, and a housing program of 294 units (see Figure 3).

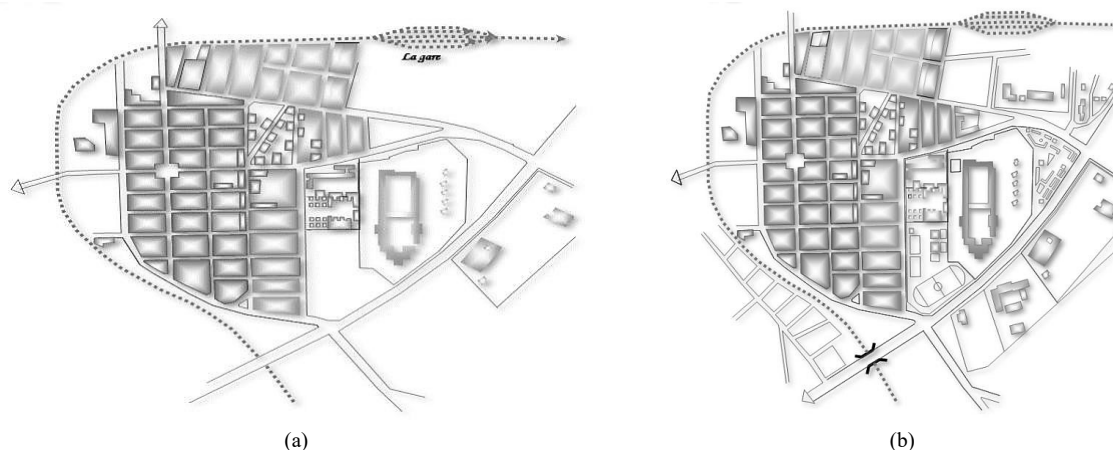


Figure 3. Maps illustrating the TN evolution (a) after the period of independence and (b) after the addition of various amenities

2.5.5 Situation and description of “July 5, 1962 Garden”

The garden occupies an irregular-shaped plot of land measuring approximately 1 hectare. This garden is categorized as a small public garden of the square type. The term “square” originated from the English word and is derived from the Old French *esquarre*, meaning square. It refers to a small public garden [18], typically enclosed by a fence and located in the center of a square. According to Le Robert Dictionnaire [18], these gardens are primarily designed as urban spaces for leisurely walks, relaxation, and socializing. Initially, games were prohibited in these gardens, but over time, they have become allowed, and the lawns are now accessible to visitors. The objective was to offer visitors the opportunity to experience the harmonious blend of nature and architecture, an experience that had previously been exclusive to affluent property owners whose private residences and gardens were inaccessible to the public [19]. The design of the “July 5, 1962 Garden” was created during a period of notable municipal enthusiasm for enhancing the city’s green spaces, spanning from 2007 to 2011. See Figure 4 for the shape, situation, and layout of the garden.

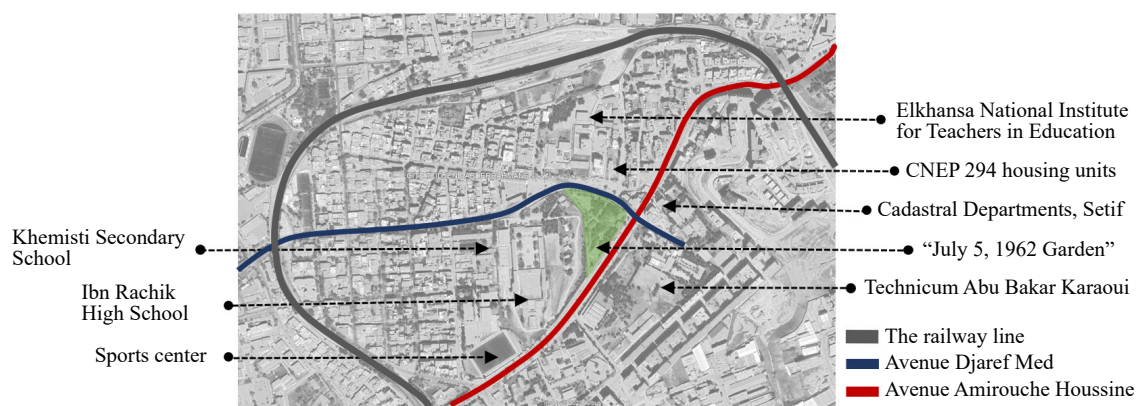


Figure 4. Situation and layout of the “July 5, 1962 Garden” in Abderrahmane TN, and the surrounding area. Note: CNEP = Caisse Nationale d’Épargne et de Prévoyance (National Savings and Provision Fund)

Table 1 effectively depicts the outcomes of the project conducted between 2007 and 2011 for the future TN Garden, which received substantial funding. On July 5, 2010, the garden in the TN was inaugurated and named “July 5, 1962 Garden” in commemoration of Youth and Independence Day. In 2004, a budget of 9 billion dinars was allocated to the development and revitalization of green spaces, with a significant portion dedicated to urban green space development. See Table 1 for a breakdown of the completed works between 2007 and 2011, along with the corresponding financial estimates for the development of this green space.

Table 1. Works conducted between 2007 and 2011 and estimated financial allocations for the development of this green space [20]

Green space	Work	Total sum
“July 5, 1962 Garden”	- Soil preparation	275,000,000 DA
	- Planting of trees, natural grass, and roses	
	- Border reconstruction	

Note: DA = Algerian Dinar

2.5.5.1 Morphological approach: Design style

The morphological approach in the study of this garden reveals its design style, which is influenced by the

French or classical style, as depicted in Figure 5. This garden style, originating in the 16th century and championed by Philibert de l'Orme, a French Renaissance architect, revolutionized the concept of ordering nature based on principles of geometry, optics, and perspective. Prior to this, French gardens lacked proportion and were confined to medieval enclosure models. The influence of Louis XIV further solidified this style in the 17th century [21]. The French-inspired garden in Tlidge exhibits a desire to impose order upon nature and emphasizes aesthetics and symbolism. It incorporates proportional elements, symmetry, and geometric forms, such as semicircles. An aesthetic and symbolic fountain serves as a guiding feature at the garden entrance, while the interplay of light and the strong presence of nature enhance the overall experience, as shown in Figures 5(a) and 5(c). Figure 5(b) shows the appearance of a scheme illustrating the concept of a garden city according to Ebenezer Howard's "The Garden Cities of Tomorrow" and its similarity with the design of the "July 5, 1962 Garden".

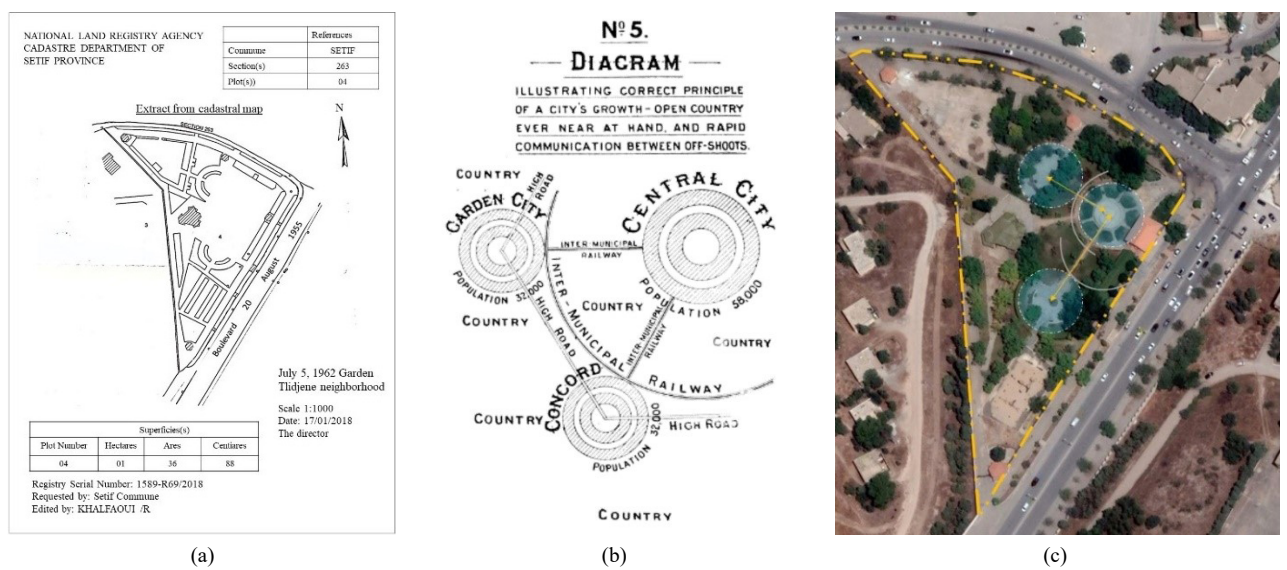


Figure 5. (a) A cadastral plan of the garden provided by the Cadastral Department, Setif; (b) a schematic representation illustrating the concept of a garden city based on Ebenezer Howard's work, "The Garden Cities of Tomorrow" [22]; and (c) an overview of the garden (from Google Earth Maps) showcasing its main design principles

2.5.5.1.1 Five distinct spaces can be identified within the "July 5, 1962 Garden"

The garden consists of five distinct spaces: the fountain, green areas, covered paths with a green roof or pergola, tree-lined passageways with benches, and the playground (see Figure 6).

The "July 5, 1962" square is a small, irregularly shaped area within the neighborhood [23]. Despite its small size, it features lush grass and plants, creating a green and refreshing ambiance. The square is enclosed by the fence of Ibn Rachik on one side and a gate on the other side, ensuring a sense of privacy and security. Although it does have fountain games and kiosks, this natural plot is open to the public and serves as a peaceful and enjoyable green space for residents passing by on their way home. Situated in a residential and educational area, the square offers a pleasant break from the surrounding environment.

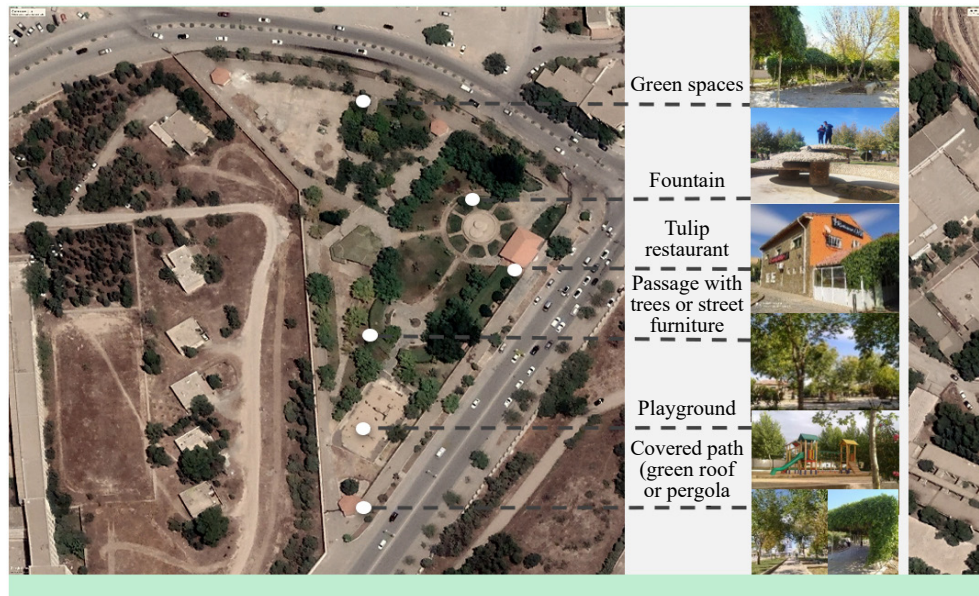


Figure 6. Mapping of the components within the “July 5, 1962 Garden”

2.5.5.1.2 Components of the “July 5, 1962 Garden”

This garden can be categorized into two types: intangible and tangible elements [24]. The intangible elements include the external shape, colors, textures, light, and smell that collectively contribute to the overall ambiance of the garden [25]. These elements create a sense of characterization and provide a pleasant sensory experience for visitors. The tangible elements encompass vegetation cover, water features, urban furniture, walls, fences, and soil. Plants, especially trees, play a vital role in the garden, providing aesthetic beauty, reducing pollution, offering shade and cooling, and promoting biodiversity. Examples of trees in the garden include White Mulberry, Aspen Poplar, Red Gum Tree, Canary Date Tree, and Canary Palm Tree. Based on data from the Department of Green Spaces, Setif City, 2023, Table 2 provides an inventory of tree species planted in the garden in 2018. Figure 7 shows the photographs of various tree species in the garden, and Figure 8 illustrates the garden plan in three different years, showing the garden before and after the trees were planted.

Table 2. Inventory of tree species in the garden for the year 2018

Scientific name		
Species	Gender	Family
<i>Morus alba</i> L.	<i>Morus</i>	Moraceae
<i>Populus tremula</i> L.	<i>Populus</i>	Salicaceae
<i>Cupressus sempervirens</i> L.	<i>Cupressus</i>	Cupressaceae
<i>Acer negundo</i> L.	<i>Acer</i>	Accraceae
Not available	<i>Acacia</i>	Fabaceae
<i>Platanus occidentalis</i> L.	<i>Platanus</i>	Platanaceae
<i>Eucalyptus camaldulensis</i> Dehnh	<i>Eucalyptus</i>	Myrtaceae
<i>Schinus molle</i> L.	<i>Schinus</i>	Anacardiaceae
<i>Washingtonia robusta</i> H.Wendl.	<i>Washingtonia</i>	Arecaceae
<i>Phoenix canariensis</i> hort.	<i>Phoenix</i>	Arecaceae



Figure 7. Various tree species in the “July 5, 1962 Garden”



Figure 8. Evolution of the garden plan before, during, and after planting trees in the years (a) 2004, (b) 2018, and (c) 2023

The second type is shrubs, which are smaller woody plants compared to trees. They typically have multiple permanent stems branching from or near the ground. Figure 9 illustrates the different types of shrubs installed in the garden. Additionally, Table 3 provides confirmation of the inventory of shrub species in this garden.



Figure 9. Examples of shrubs

Table 3. Inventory of shrub species in the garden for the year 2018

Scientific name		
Species	Gender	Family
<i>Prunus cerasifera f. atropurpurea</i> Diffel	<i>Prunus</i>	Rosaceae
<i>Euonymus japonicus</i> L.f.	<i>Euonymus</i>	Celastraceae
<i>Nerium oleander</i> L.	<i>Nerium</i>	Apocynaceae
<i>Myoporum laetum</i> G. Forst.	<i>Myoporum</i>	Myoporaceae
Not available	<i>Rosa</i>	Rosaceae
<i>Ligustrum japonicum</i> Thunb.	<i>Ligustrum</i>	Oleaceae
<i>Ligustrum vulgare</i> L.	<i>Ligustrum</i>	Oleaceae
<i>Platycladus orientalis</i> (L.) Franco	<i>Platycladus</i>	Cupressaceae

Flowering herbs make up the third type of plant in the garden. Climbing plants are used for their ability to climb and decorate structures. They play a protective and aesthetic role, offering shelter and enhancing the visual appeal of the garden, especially on sunny summer days. The fourth type consists of aromatic plants such as Officinal Lavender, True Lavender, and Narrowleaf Lavender (see Figure 10). Tables 4 and 5 show a detailed list.



Figure 10. Example of flowered herbs

Table 4. Inventory of flowered herb species in the garden for the year 2018

Scientific name		
Species	Gender	Family
<i>Lavandula angustifolia</i> Mill.	<i>Lavandula</i>	Lamiaceae
<i>Canna</i> L.	<i>Canna</i>	Cannaceae
Not available	<i>Dahlia</i> sp	Astéraceae
<i>Antirrhinum majus</i> L.	<i>Antirrhinum</i>	Scrophulariaceae
<i>Gazania rigens</i> (L.) Gaertn.	<i>Gazania</i>	Asteraceae
<i>Erysimum cheiri</i> (L.) Crantz	<i>Erysimum</i>	Brassicaceae
<i>Dianthus chinensis</i> L.	<i>Dianthus</i>	Caryophyllaceae
<i>Parthenocissus quinquefolia</i> (L.) Planch.	<i>Parthenocissus</i>	Vitaceae

Table 5. Inventory of aromatic species of plants in the garden for the year 2018

Scientific name		
Species	Gender	Family
<i>Lavandula angustifolia</i> Mill.	<i>Lavandula</i>	Lamiaceae

The rose is widely regarded as the most beloved flower, captivating users through its vibrant colors, delightful fragrance, and beautiful shape. Additionally, the lawn serves as a lush carpet, offering a visually appealing, compact, uniform, and harmonious appearance with its regular structure (see Figure 11). It holds a significant place in the pleasure garden, evoking a sense of relaxation and providing a pleasant environment, as shown in Figure 11(a). This harmonious garden combines the calming ambiance of water features, such as the fountain and water jets, as shown in Figure 11(b), with the defining presence of a metal grid fence, ensuring both aesthetic appeal and functional boundaries.



(a)



(b)

Figure 11. (a) Garden landscape and (b) fountains

The fertile soil provides vital support and nutrients to the thriving plants and stones within the garden (see Figure 12(a)), while strategically placed urban furniture elements, as shown in Figure 12(b), including benches, seats, lighting poles, and wastebaskets, add comfort and convenience, enhancing the garden's overall functionality. Together, these elements seamlessly integrate to create an inviting and user-friendly environment where visitors can enjoy the beauty and serenity of this delightful refuge.



(a)



(b)

Figure 12. (a) Garden soil and (b) garden furniture

2.5.5.2 Sensory landscape approach: The joyful animation and ambiances of the garden

The small garden of TN fosters spontaneous communication and encourages social interactions, while also ensuring a safe environment for visitors. The secure design and features of the garden, as depicted in Figure 13, contribute to a sense of safety and comfort [26], allowing people to enjoy the space and engage with one another freely.



Figure 13. The ambiance and visitor frequentation in the garden and the vibrant activities by children

A playground is available for children, where they can freely engage in activities such as playing ball and exploring nature by collecting leaves and branches. This vibrant atmosphere of children's playfulness can be seen in Figure 14(a). The small green space is a delightful and inclusive area for children. It is a freely accessible space for everyone, with accessible lawns and permitted games.

2.5.5.2.1 Daytime ambience

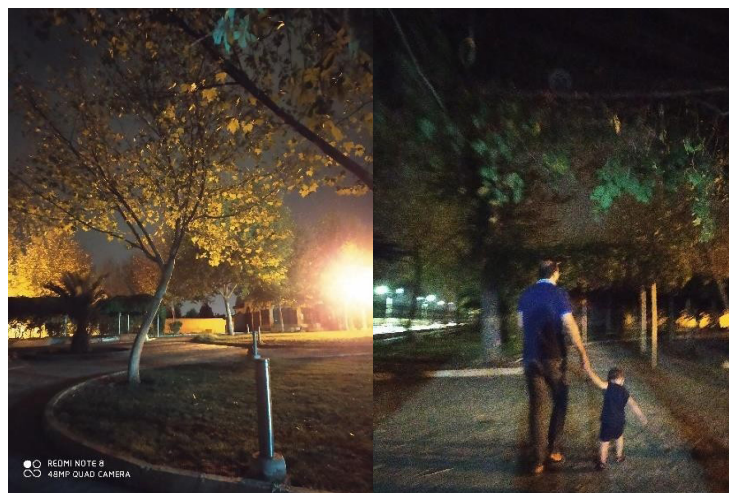
During the day, the garden exudes a tranquil and inviting atmosphere. The carefully selected shrubs and bushes create a lush and green backdrop, complemented by semi-circular concrete paths and benches. The vibrant colors of the flowerbeds, adorned with roses and perennials, add a touch of beauty and liveliness to the space. The plant palette, the presence of a fence, and the overall ambience create an intimate setting that attracts visitors, as shown in Figure 14(a).

2.5.5.2.2 Nocturnal ambience

As the sun sets, the garden transforms into a captivating nocturnal ambience. The soft glow of strategically placed lighting fixtures illuminates the pathways, creating a sense of enchantment and guiding visitors through the space. The play of light and shadows accentuates the beauty of the garden, highlighting the textures and colors of the plants and architectural elements. The tranquility of the garden at night provides a peaceful retreat, inviting visitors to relax and enjoy the serene atmosphere, as depicted in Figure 14(b).



(a)



(b)

Figure 14. (a) The lively atmosphere and joyful interactions, and (b) the enchanting night atmosphere

3. Results and discussion

The flowchart shown in Figure 15 provides a visual representation of the research methodology and the sequential presentation of the findings. It effectively illustrates the systematic approach used in the study and presents the results in a clear and organized manner.

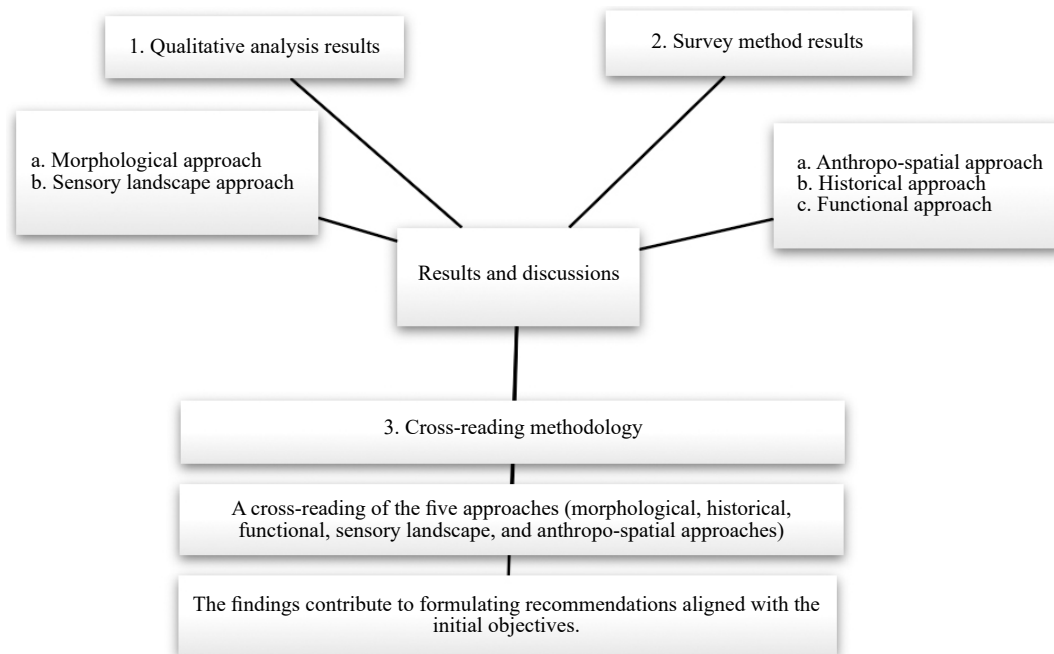


Figure 15. Methodology for presenting and analyzing results and discussions

3.1 Qualitative analysis: The morphological and sensory landscape approaches

The analysis of the “July 5, 1962 Garden” using the morphological approach reveals its French or classical design style, characterized by geometric forms, symmetry, and an aesthetic and symbolic fountain as a central feature. The garden is divided into distinct spaces, including the fountain, green areas, covered paths, tree-lined passages with benches, and a playground. On the other hand, the sensory landscape approach highlights the garden’s vibrant and inviting ambiance, fostering spontaneous communication and social interactions. During the day, the garden emanates tranquility, with lush vegetation, semi-circular concrete paths, and benches providing a comfortable setting. At night, strategically placed lighting fixtures create an enchanting atmosphere, guiding visitors through the space and accentuating the beauty of the plants and architecture. The playground adds to the garden’s appeal, allowing children to engage in playful activities and explore nature. Overall, this garden offers a well-designed, multi-functional, and joyous space that celebrates nature and promotes community interactions.

The analysis and findings based on both the morphological and sensory landscape approaches shed light on the well-designed and harmonious nature of the “July 5, 1962 Garden”. The garden’s French or classical style, lush vegetation, and strategic placement of elements create a tranquil and inviting ambiance during the day, while the subtle play of lighting and shadows adds enchantment to the nocturnal ambiance. The garden’s multi-use spaces, secured design, and inclusion of a playground promote spontaneous communication and social interactions among visitors. The presence of urban furniture further enhances the overall experience, providing a user-friendly and inclusive environment for all to enjoy. The sensory landscape approach highlights the vibrant and lively ambiance of this garden, fostering spontaneous communication and social interactions among visitors. The garden’s design and features contribute to a sense of safety and comfort, providing a welcoming environment for people to engage freely with one another. The

inclusion of a playground further enhances the garden's appeal, allowing children to engage in playful activities and explore nature by collecting leaves and branches, as evident in the lively atmosphere. This small green space, devoid of furniture, offers an inclusive area for all to enjoy, with accessible lawns for permitted games. Inclusive, the "July 5, 1962 Garden" serves as a valuable and enjoyable urban green space, offering residents and visitors a harmonious blend of nature and architecture within the community.

The data collected from the concerned departments has revealed a rich inventory of tree species in the garden for the year 2018. This inventory serves as evidence of the garden's potential to promote biodiversity and enhance the environment. The presence of diverse vegetation within the garden has significant implications for the urban microclimate, as it mitigates the urban heat island effect and positively influences climate change. The vegetation acts as a natural shield, providing solar protection and effectively controlling radiation, thereby stabilizing air temperatures through water retention and evapotranspiration. Beyond their aesthetic appeal, the wide variety of plants, including shrubs, trees, flowering herbs, aromatic plants, roses, and lawns, play multifaceted roles. They actively contribute to rainwater absorption and demonstrate an "antipollution" effect by stabilizing CO₂ levels and reducing noise pollution in the neighborhood. Moreover, this garden serves as a haven, attracting and supporting numerous species of animals and insects, fostering a thriving biodiversity within the community. These findings underscore the vital role this green space plays in contributing to the ecological health and overall well-being of the urban environment.

3.2 Survey: Anthro-spatial, historical, and functional approaches

The survey was structured to embrace a citizens' participatory approach, aiming to gather detailed information about the garden while understanding the community's desires regarding various aspects, such as its history, characteristics, services, informal trade, and playgrounds. The findings, as presented in Table 6, illustrate the population distribution and different samples categorized by gender, age, occupation, and residential area. Through this approach, valuable insights were obtained, enabling a comprehensive analysis through anthro-spatial, historical, and functional approaches. These combined approaches shed light on the garden's design, layout, and multiple functions, providing a holistic understanding of its significance and impact on the community and the environment.

Table 6. Population distribution and different samples by gender, age, occupation, and residential area

	Population distribution	Sample
Male	53.1%	17
Female	46.9%	15
		32 answers
Less than 20 years old	3.23%	1
Between 20 and 30 years old	29.03%	9
More than 30 years old	67.74%	21
		31 answers
Architect	30.00%	9
Accountant	3.33%	1
Teacher	13.32%	4
Housewife	3.33%	1
Civil servant	16.65%	5
Doctor	3.33%	1
Retired	13.32%	4
Student	6.73%	2
Journalist	3.33%	1
Judge	3.33%	1

Table 6. Continued

	Population distribution	Sample
Other	3.33%	1
		30 answers
TN (Bon Marché)	46.62%	14
Setif and its surroundings:	50.05%	15:
Setif neighborhood	26.65%	8
El Hidhab neighborhood	3.33%	1
1,006 housing units' neighborhoods	3.33%	1
1,014 housing units' neighborhoods	3.33%	1
The Tours	3.33%	1
Ras Elma	3.33%	1
El Hchichia	6.66%	2
Batna	3.33%	1
		30 answers

3.2.1 Anthro-spatial approach: Public perceptions

3.2.1.1 Public perceptions of the garden

The survey results based on the anthro-spatial approach “public perceptions” provide valuable insights into the awareness and preferences of the community regarding the “5 July 1962 Garden” in TN [27]. The finding shows that 50% of respondents view the garden as a respectful and important space in the neighborhood that can be seen as a positive indicator of its value and significance to the community. This perception may be influenced by the garden’s historical significance, its role as a communal gathering space, and its contribution to the overall aesthetic appeal of the neighborhood. However, it is crucial to note that 21.9% of respondents expressed dissatisfaction with the garden, deeming it poorly qualified and arranged (see Figure 16). This finding indicates potential areas for improvement and further investigation into the specific aspects of the garden that may need attention. Analyzing the reasons behind this dissatisfaction and identifying the specific issues raised by this subgroup of respondents can help guide future enhancement efforts.

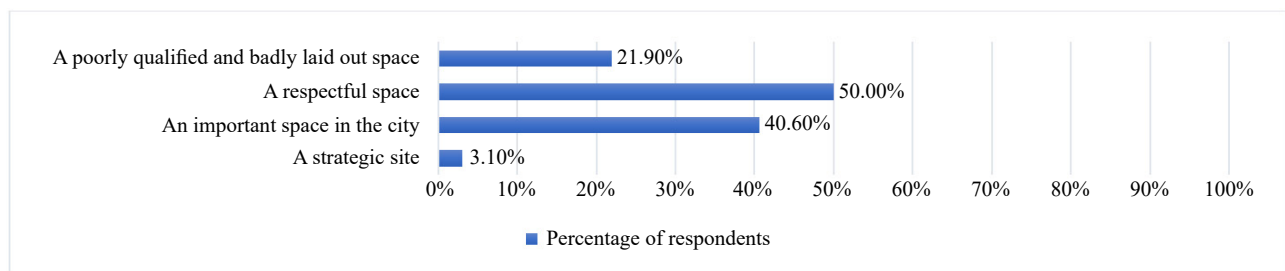


Figure 16. Public perceptions of the garden

3.2.1.2 Motives for garden visitation and functional aspects

Regarding the uses and functions of the garden, the survey’s finding that 81.3% of respondents frequent the space for relaxation is consistent with its primary purpose as a public green space. This finding justifies the garden’s significance as a tranquil oasis for residents to unwind and enjoy nature. Additionally, 9.4% of respondents who visit

the garden for dining and other recreational activities demonstrate its versatility as a multi-functional space (see Figure 17). The garden’s role as a place for social interactions and family activities further supports its value to the community. Notably, the inclusion of dedicated play areas for children showcases the garden’s commitment to inclusivity, catering to diverse age groups, and fostering a sense of belonging for all. In this way, the garden effectively fulfills its purpose of meeting the community’s needs and preferences, acting as a cherished space that enriches the lives of its visitors.

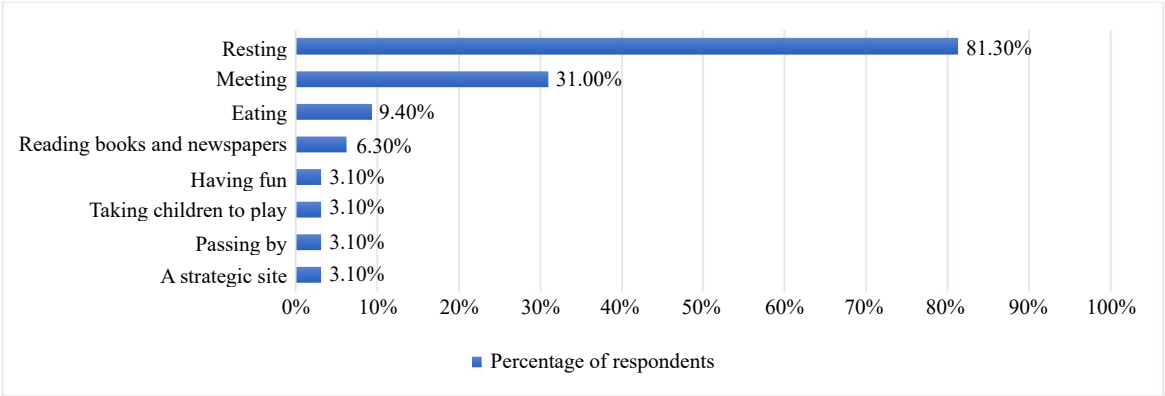


Figure 17. Reasons for visiting the garden

3.2.1.3 Disturbances

The survey’s exploration of disturbances faced by visitors, as shown in Figure 18, offers valuable insights for improving the garden’s overall experience. The finding shows that 56.3% of respondents are bothered by the lack of facilities beyond public benches, thereby indicating a need for additional amenities to enhance visitor comfort. Justifying the installation of seating areas, restrooms, and possibly refreshment kiosks can make the garden more inviting and encourage prolonged visits. The concern raised by 34.4% of respondents about the garden’s exposure to the sun highlights the importance of providing adequate shading solutions, such as pergolas, umbrellas, or strategically planted trees. This consideration can create a more enjoyable environment, especially during hot weather. The fact that 21.9% of respondents are upset by noise from cars suggests a need for measures to mitigate traffic noise, such as sound barriers or better traffic management in the surrounding area.

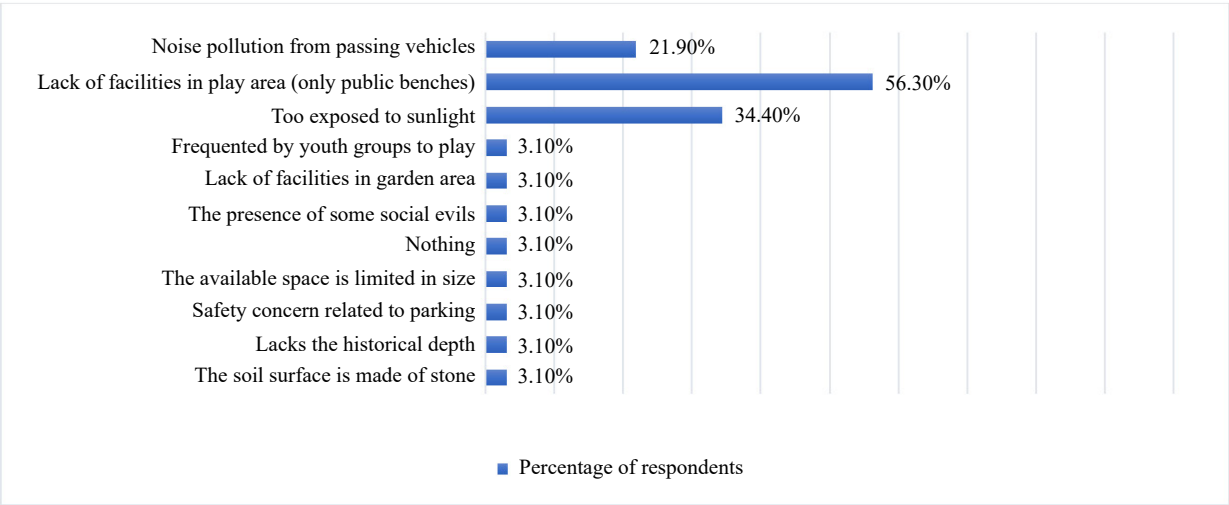


Figure 18. The disturbances faced by visitors of the garden

3.2.1.4 Attractivity

The analysis of attractivity factors provides valuable insights into the garden's strengths and unique selling points. The finding shows that almost 70% of respondents find greenery diversification and strategic location to be the most appealing features, which underscores the significance of landscaping and urban planning in creating an attractive and inviting environment. Justifying the investment in maintaining diverse plant species and thoughtful garden design can further enhance the garden's visual appeal. The positive feedback regarding the garden's peaceful and secure atmosphere validates the importance of safety measures and the role of green spaces in fostering a sense of well-being in urban environments. The accessible lawn and the presence of play areas for children also contribute to the garden's attractivity and reinforce its status as a family-friendly destination. The acknowledgment of good memories associated with the garden and the design of the fountain highlight the emotional and aesthetic aspects that can contribute to visitor satisfaction.

3.2.2 Historical approach

We employed a "Historical Witnessing Survey" as a strategy to gather detailed information about the historical approaches related to our original work, as this particular case study had not been previously studied and there were limited available data. Conducting the survey with our observation and analytical thinking allowed us to obtain firsthand accounts and witnesses' descriptions of the area's historical context and its transformation over time.

3.2.2.1 History

Regarding the inquiry into the history and transformation of the "July 5, 1962 Garden", 23.10% of respondents answered negatively, while 9.90% responded affirmatively without offering explanations. The remaining participants shared their insights based on their own experiences. Among the notable responses, one individual remarked: *"This space has been developed two or three times in the last 15 years and was once a wasteland, frequented more by miscreants and plagued by social issues"*. Another response said that the garden underwent multiple transformations over the years, evolving from embankments and a former garbage dump to a public garden in the mid-1980s, with further rehabilitation in the 2000s, following the municipality of Setif's intervention. A college student recalled the poorly equipped and unsafe condition of the Bon Marché garden during their college years from 2008 to 2011, but it was later closed for rehabilitation.

The most intriguing response was from a participant who mentioned that the garden has undergone multiple development phases within the last 15 years. This insight sheds light on the garden's dynamic nature and its adaptability to changing needs and preferences. The reference to the garden being a wasteland reserved for miscreants and social issues in the past highlights the challenges the space faced before its transformation. Understanding this historical context is crucial for appreciating the positive changes and improvements made over time. Moreover, the accounts describing the land's previous uses as embankments for a high school and a garbage dump underscore the garden's evolution from neglected spaces to a well-designed public garden. The involvement of the municipality of Setif in transforming and developing the garden demonstrates a commitment to revitalizing urban spaces and enhancing the neighborhood's overall image. The narrative provided by a former college student offers a personal perspective on the garden's condition during a specific period, emphasizing the lack of attention and security issues that hampered its popularity and usage.

3.2.2.2 Evolutions: Urban reconquest in question

The garden's development occurred between 2007 and 2011, a period that marked a shift away from coveting open spaces as urban wasteland [28]. During this time, there was a notable shift in urban planning practices, moving away from viewing open spaces as wastelands. This shift can be attributed to changing perspectives on the importance of green spaces and their potential to enhance the urban environment. The garden's previous state as a former public dump and an abandoned area within the residential district presented several challenges, including negative social perceptions and a detrimental impact on the neighborhood's overall image. However, the concept of urban reconquest proved

relevant in this context, as efforts were made to revitalize and reclaim the space for public use.

The transformation of the former dump and neglected space into a public garden demonstrates a conscious urban planning decision to create a green oasis, enhancing the area’s aesthetics and functionality. This aligns with broader urban development goals, promoting well-being and recreation for residents. The investment in rehabilitation highlights a commitment to improving the neighborhood and fostering community spirit. The pragmatic spatial evolution utilizes easy and empty lands, ensuring a feasible and cost-effective transformation while enhancing the neighborhood’s green infrastructure and community well-being.

In conclusion, the garden’s transformation exemplifies the effectiveness of urban planning strategies in revitalizing neglected spaces and creating valuable public areas. It highlights the significance of green spaces and community involvement in fostering sustainable and vibrant neighborhoods. Figure 19 shows more clarification on this matter.

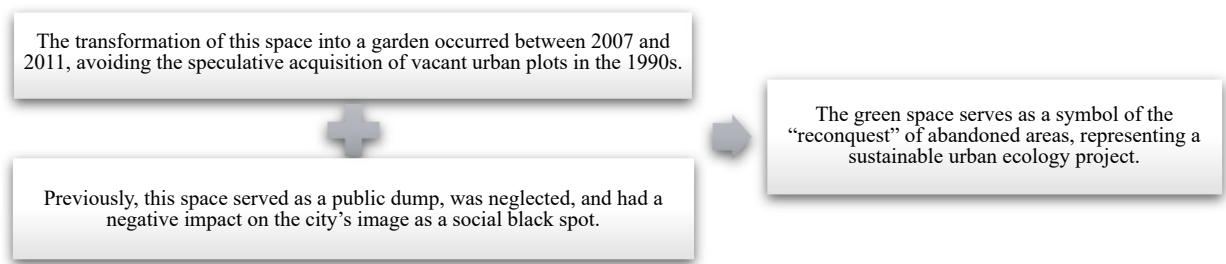


Figure 19. Urban reconquest

3.2.3 Functional approach

3.2.3.1 Frequentations, accessibility, and parking

According to field studies and Figure 20(a), the survey’s findings on frequentation rates show that the garden receives a lot of visitors. Further exploration into visitors’ preferred time to visit revealed that a significant majority (71.9%) favor the evening, as shown in Figure 20(b), due to the absence of direct sunlight, creating a more pleasant climate for leisure activities and relaxation after work.

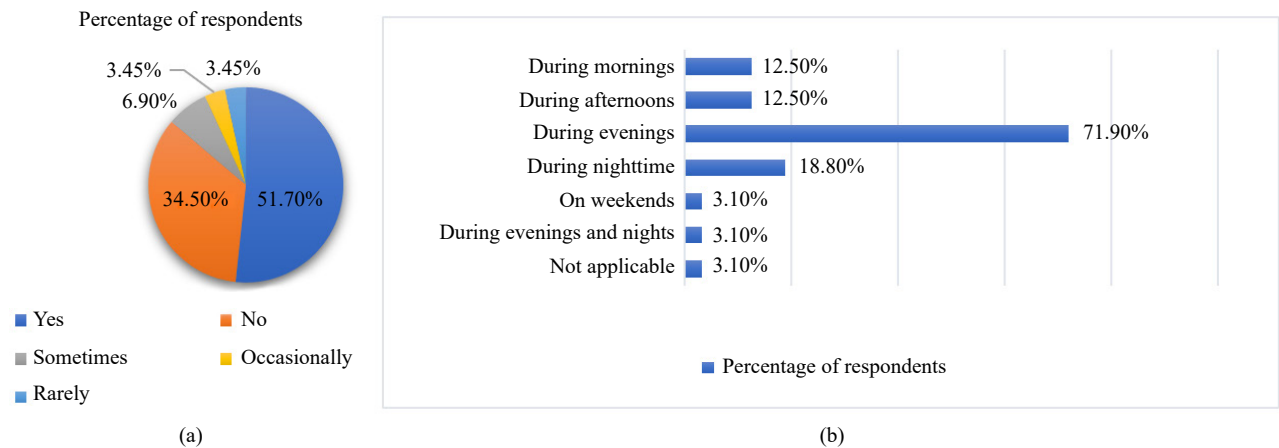


Figure 20. (a) Garden frequentation rates and (b) the respondents’ opinion on the best time to visit this garden

The survey assessed accessibility and parking, highlighting that a majority of visitors arrive by car and park nearby. However, it was noted that parking availability is currently limited due to the presence of a parking curb. These two

insights of frequentation and accessibility underscore the garden’s popularity among visitors while also pointing to the need for thoughtful planning to enhance accessibility and parking options for a more enjoyable experience.

3.2.3.2 Services

The survey results indicate that a substantial number of visitors find the restaurant and its services to be appealing, contributing positively to the garden’s overall attractiveness. However, some respondents expressed reservations or concerns about certain aspects, as evident in Figures 21(a) and (b). This analytical approach enables the establishment to make informed decisions based on real data, enhancing the overall attractiveness of the garden and ensuring that visitors’ needs and preferences are met. Regularly gathering feedback and monitoring trends can also aid in maintaining a dynamic and customer-oriented restaurant service, fostering a positive impression among visitors, and enhancing their overall experience.

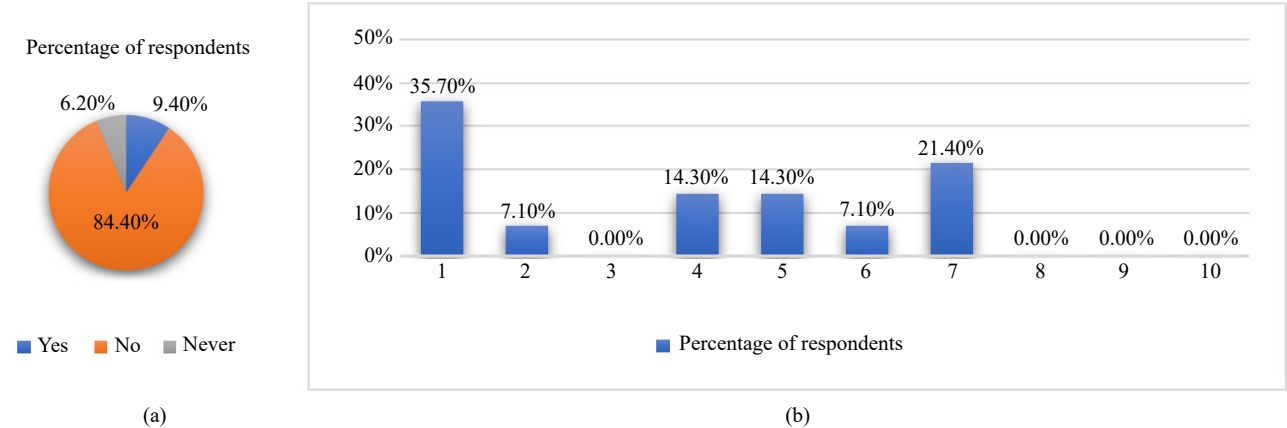


Figure 21. (a) Restaurant frequentation rates and (b) restaurant services rating out of 10

The discussion on informal trade surrounding the garden reflects a diversity of opinions among the 18 respondents. While 56.3% expressed concerns about the prevalent anarchy caused by youngsters engaging in informal trade throughout the area, 40.6% highlighted hygiene issues. Interestingly, only 37.5% acknowledged that informal trade serves the needs of families, as shown in Figure 22(a). Delving deeper into the impact of informal trade on the urban ambiance and atmosphere, 32 responses were received. Surprisingly, over 60% stated that it has a negative influence, attributing this to the disturbances caused by gatherings of young people that disrupt families, as shown in Figure 22(b). Conversely, some respondents perceived a positive impact, as informal trade caters to individual needs and creates a joyful atmosphere for children and visitors. Nevertheless, the consensus seems to call for improvements in maintaining hygienic conditions. Figure 23 illustrates the rate out of 10 for informal trade services.

The analysis of these perspectives sheds light on the complexities surrounding informal trade and the need for a balanced approach that addresses concerns while leveraging its positive aspects to enhance the overall urban experience. Consequently, this information can inform future initiatives to strike the right balance between accommodating informal trade’s benefits and mitigating its potential drawbacks, ultimately fostering a more vibrant and harmonious urban environment.

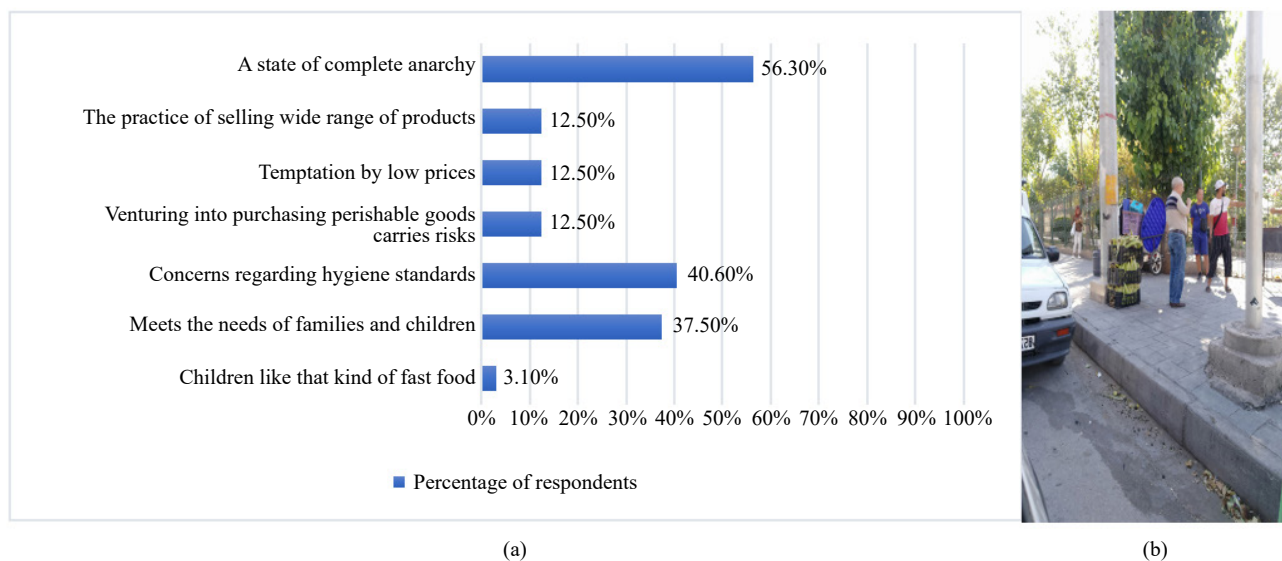


Figure 22. (a) Respondents' opinions on the informal trade, and (b) a photograph providing a visual representation of the phenomenon

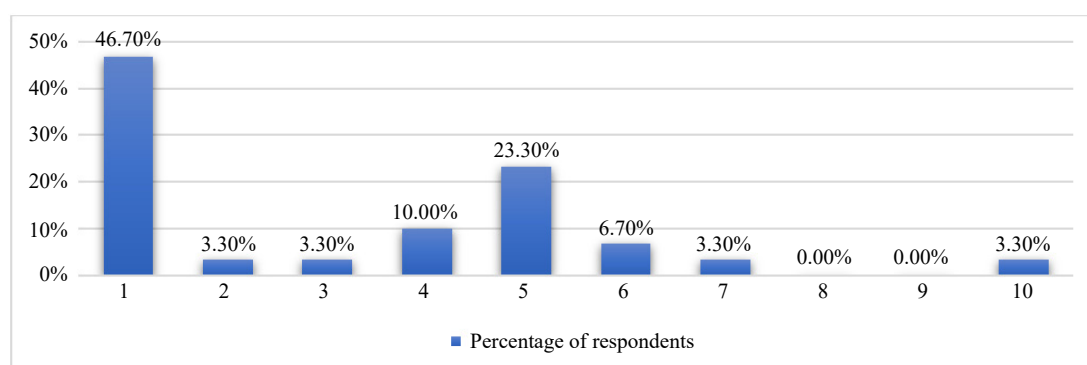


Figure 23. Informal trade services rating out of 10

The discussion on playground design reveals diverse opinions among respondents, as evident from Figures 24 and 25. Approximately 53.3% of participants expressed dissatisfaction with the current layout, citing the lack of benches for parents as a major concern. This highlights the need to prioritize parental comfort and involvement in the play area. However, respondents also noted positive aspects, emphasizing the playgrounds' accessibility and safety for children of all ages. To optimize the playground design, a balanced approach is essential. Addressing the absence of benches can create a more family-friendly environment, encouraging longer visits and increased enjoyment. Furthermore, continued efforts to ensure safety and accessibility are vital to catering to a diverse range of visitors. By considering both the negative and positive feedback, authorities can make informed decisions to enhance the overall appeal and inclusivity of the garden's playgrounds.

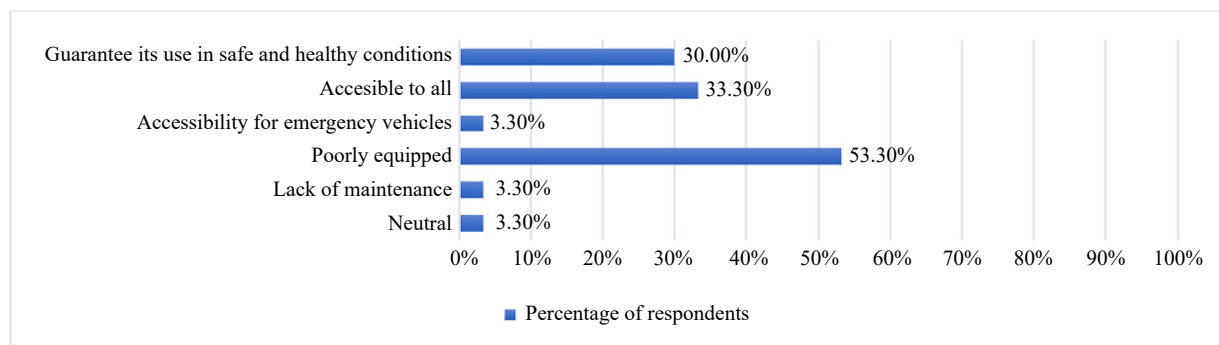


Figure 24. Respondents' opinion on the design of the playground

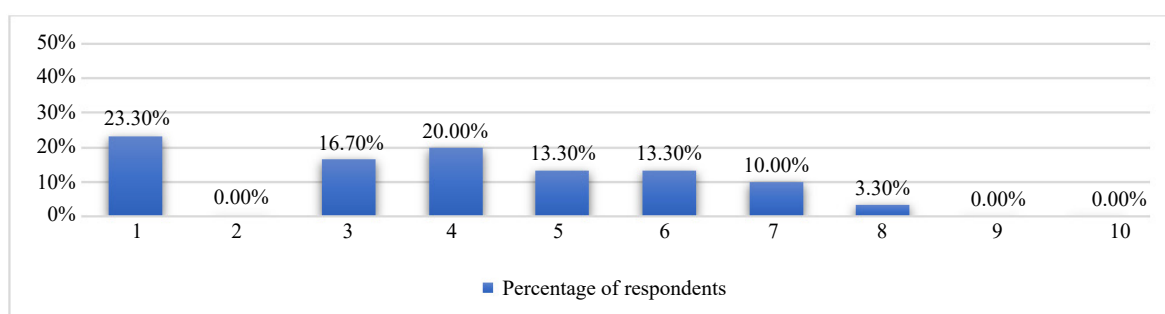


Figure 25. Playground services rating out of 10

3.3 Cross-reading: Interpretation and synthesis of the obtained results

The study employs the cross-reading methodology, integrating qualitative analysis and a survey approach to comprehensively examine the garden's various dimensions. A participatory approach involving stakeholders and a digital platform survey complement field observations. Five distinct approaches—morphological, historical, functional, sensory landscape, and anthropo-spatial—are utilized to provide a well-rounded analysis of the case study, gaining insights into the garden's significance, evolution, functionality, sensory appeal, and impact on the community. The analysis of the obtained results underscores the significant role of this garden as a vital green space for the community, providing a serene and comfortable environment for relaxation and well-being. It plays a crucial role in enhancing the residents' quality of life by offering various sensory comforts such as thermal regulation, tactile experiences, pleasant sounds, and pleasing visuals. The garden's function as a gathering place fosters a sense of community and social interaction among the inhabitants. Moreover, its greenery contributes to a favorable microclimate during the summer, offering shade and cooling effects while also acting as a natural barrier against wind, dust, and noise. This multifunctional garden caters to individuals of all age groups, creating a joyful ambiance that appeals to children, teenagers, young adults, and the elderly alike. Overall, the presence of urban vegetation in this neighborhood is of immense significance, providing numerous benefits and enhancing the overall well-being of its residents.

3.3.1 Aspirations: Community-requested changes

As per the feedback gathered from the community, the garden in the neighborhood is appreciated for its serene ambiance, lush greenery, favorable location, the presence of informal trade, and its family-friendly environment. To gain insights into the residents' desires and expectations, we inquired about any necessary changes that would better cater to their needs, as depicted in Figure 26. Additionally, we sought their input on the specific improvements they would like to see in the garden to enhance its attractiveness and functionality. The flowchart presented in Figure 27 summarizes some of the expressed aspirations and desires shared by the community.

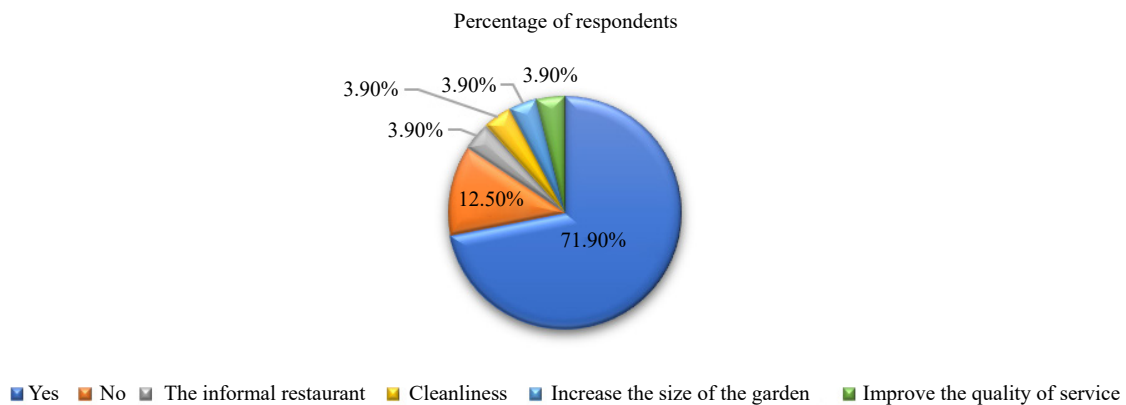


Figure 26. Responses regarding the necessity of any changes in the garden

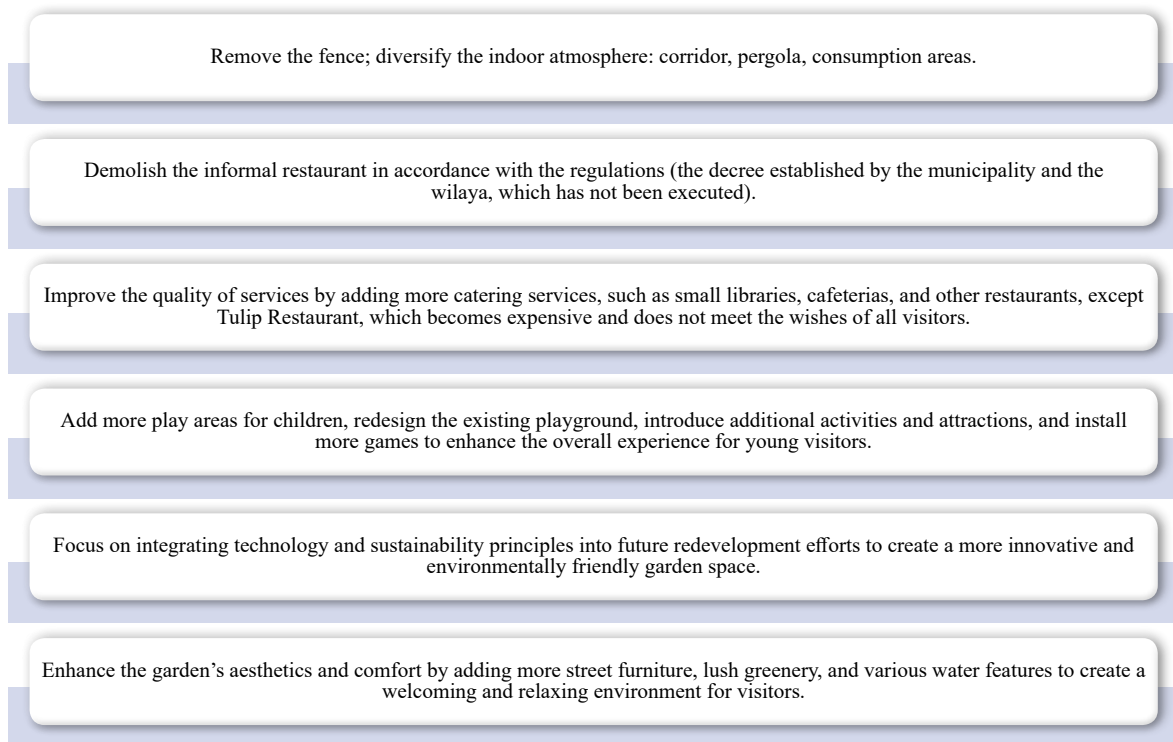


Figure 27. Garden improvement requests as per respondents' feedback

3.3.2 Recommendations

The aspirations of the visitors are taken into account in formulating recommendations that align well with the study's objectives and the visitors' desires. Respondents expressed their wishes for changes, including extending the garden's limits, demolishing informal restaurants, enhancing service quality with additional amenities like cafeterias and small libraries, adding more play areas, and redesigning the playground to offer diverse activities and attractions. Recommendations are proposed based on the visitors' preferences, aiming to create a more inclusive, attractive, and functional space that meets their needs and aspirations. By considering both the study's findings and the visitors' input, the recommendations strive to enhance the garden's overall appeal, accessibility, and usability while promoting a sense of community and well-being for the residents.

To optimize the garden's potential, we propose extending its boundaries towards the high school side, which currently occupies an unnecessary amount of space with technical areas and apartments. By reorganizing the building layout in a single row, as depicted in Figure 28, we can create a space that is more available. This expansion will not only allow for a comprehensive redesign of the garden to incorporate users' aspirations and fulfill their needs, but also enable us to create an ample area for children's toys and introduce new play elements. This strategic approach will enhance the garden's overall functionality and meet the evolving preferences of its visitors.

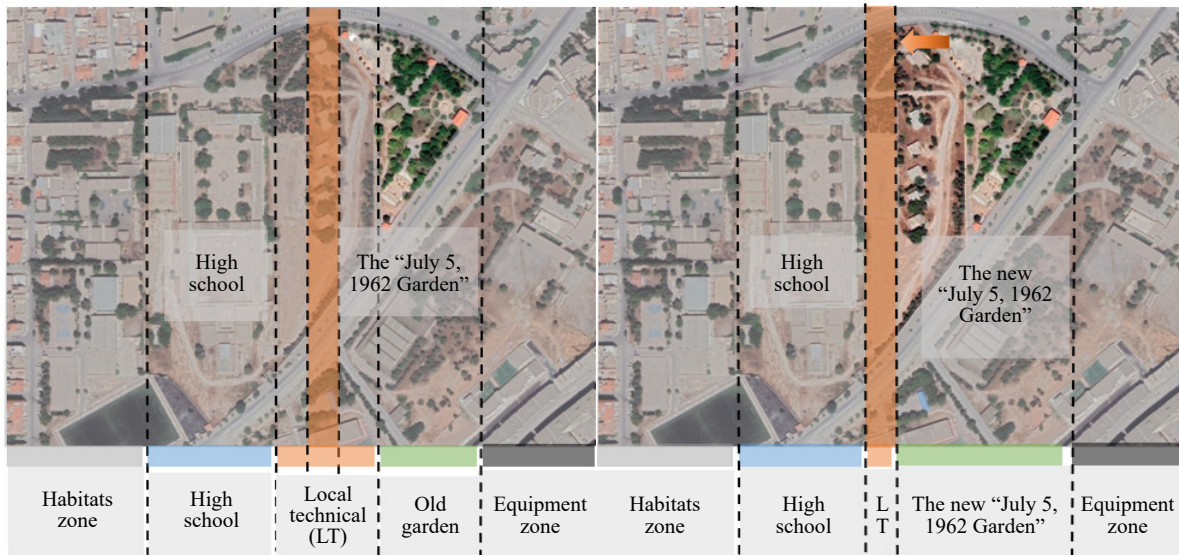


Figure 28. Recommendations

4. Conclusion

The conclusion of the study highlights the significant transformation of the “July 5, 1962 Garden” in Tlidge from a hazardous wasteland to a thriving green space through a sustainable urban ecology project. This revitalization marks a departure from densification and prioritizes the integration of green spaces in the neighborhood. The garden now serves as an open public space with diverse uses, requiring thoughtful development and management. With its emphasis on biodiversity and environmental benefits, the garden contributes to rainwater absorption and depollution efforts. The presence of trees and shrubs provides shade, creating a relaxing and comfortable atmosphere for visitors. Moreover, the garden fosters a sense of community and well-being, offering an attractive and biologically enriched environment. By integrating nature and architecture harmoniously, the garden exemplifies the importance of coherent urban planning for a more sustainable city. Its success as a rejuvenated green oasis displays the value of such spaces in promoting livability and environmental consciousness in urban environments. As cities continue to grow, the role of green spaces like the “July 5, 1962 Garden” becomes increasingly vital in creating healthier and more resilient communities.

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Conflict of interest

The authors declare no conflict of interest.

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