*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

# Analytical study of children's playgrounds performance in the residential neighbourhood units (Sulamaniyah city as a case study)

Nahedh Al-Qemaqchi[1], Dana Sdiq Sadiq[2]

[1]Department of Architectural Engineering, Cihan University- Sulaimaniya, Sulaimaniya, Iraq.
[2]Department of Architectural Engineering, College of Engineering, Sulaimaniya University, Sulaimaniya , Iraq.

Email: nahith.taha@sulicihan.edu.iq[1], dana.sadiq@univsul.edu.iq[2]

***Abstract:***

Many countries around the world are concerned about children's playground performance, particularly governments, and organizations, because of its importance in the child's life and the formation of his future behaviour. Playgrounds in open green areas are desirable and significant public places in the urban fabric because not only do they provide a space for children's play and growth outside the home but they support a healthy environment and adults' activities. Two international organizations are working on children's needs, the (UNICEF), and IPA, (International Association for the Child's Right to Play), and both organizations are responsible for supporting children all over the world with humanitarian and developmental aid including child rights for play. Experts in the field understand that the social skills that children learn in the playground are often skills that they use for the rest of their lives and carry with them into adulthood; additionally, independent studies show that playgrounds are one of the most important places outside their homes, because of those above benefits this paper attempted to assess and check the suitability of a children's playground performence in Sulaymaniyah city to occupy the children's activity; thus, the main objective is to evaluate and find solutions related to improving the performance of children's playgrounds through investigation using criteria (formed as a set of criteria which are from defferent sources mentioned it in the table (1)), developed it for that purpose, and applied the criteria on (10) neighborhood units in both government and investment sectors, it is clear that the children playground performance in the investment secotr is better than the govrment sector, the other objective of the paper is to present the effect of play and playgrounds on kids and attract the neighbourhood community to different activities.

**Keywords:** Children's playgrounds, Residential neighbourhood, Occupancy evaluation.


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

**الملخص:**

تهتم العديد من الدول حول العالم بالاداء الوظيفي الذي تقوم به ملاعب الأطفال ، وياتي هذا الاهتمام بشكل خاص من الحكومات والمؤسسات المعنية بالمجتمع، لما لملاعب الاطفال من أهمية في حياة الطفل وتشكيل سلوكه المستقبلي. وتعد الملاعب في المناطق الخضراء المفتوحة أماكن عامة مهمة في النسيج الحضري ليس لانها توفر مساحة للعب الأطفال والنمو خارج المنزل فحسب، بل لأنها تدعم البيئة الصحية وأنشطة البالغين ايضا. وهناك منظمتان دوليتان تعملان على مراقبة حق الأطفال في حياة كريمة وهما اليونسيف (UNICEF) و المنظمة العالمية من اجل حق الأطفال في اللعب (IACRP)، وكلتا المنظمتين مسؤولتان عن دعم الأطفال في جميع أنحاء العالم بالمساعدات الإنسانية والتنموية.

يحدد الخبراء في هذا المجال أن المهارات الاجتماعية التي يتعلمها الأطفال في الملعب غالبًا ما تكون مهارات يستخدمونها لبقية حياتهم ويحملونها معهم حتى مرحلة البلوغ ؛ بالإضافة إلى ذلك، تشير الدراسات السلوكية إلى أن الملاعب هي من أهم الأماكن خارج المنزل والتي يكتسب فيها الأطفال القدرة على التركيز والتفكير.

تحاول هذه الورقة القاء الضوء على مدى ملاءمة ملاعب للأطفال (في مدينة السليمانية) لاحتواء نشاطاتهم. وبالتالي، فإن مهمتها الرئيسية هي التقييم وإيجاد الحلول المتعلقة بتحسين أداء ملاعب الأطفال من خلال التحقق من استخدام المعايير الموضوعة لهذا الغرض. كما تحاول إبراز تأثير اللعب والملاعب على الأطفال من خلال جذب المجتمع المتمثل بسكان وحدة الجيرة السكنية للأنشطة المختلفة.

**الكلمات المفتاحية:** ملاعب الأطفال، الأحياء السكنية، تقييم الإشغال.

**پوختە:**

لە زۆربەی وڵاتانی جیهاندا بایەخێکی گەورە هەیە بە یاریگای منداڵان، بەتایبەت لەلایەن دەسەڵات، رێکخراوەکان، وە کۆمپانیاکان ....هتد، لەم ڕوانگەیەوە دوو ڕێکخراوی جیهانی هەن بایەخ دەدەن بە پێداویستیەکانی منداڵان وکار لەسەر ئەم بابەتە دەکەن، لەم پێداویستیانەش مافی منداڵ بۆ یاریکردن و دابینکردنی شوێنی یاریکردن، لەم ڕێکخراوانەش ڕێکخراوی یونیسێف ( دوو خاڵی گرنگی لەسەر مافەکانی منداڵ جێگیرکردووە لە پەیڕەو و پڕۆگرامی خۆی) هەروەها ڕێکخراوی جیهانی بۆ مافی یاریکردنی منداڵان .

شارەزایانی ئەم بوارە دەزانن کەوا فێربوون و پتەو کردنی پەیوەندی کۆمەڵایەتی منداڵان کە لە یاریگاوە فێری دەبن ئەو پەیوەندییە کە تا گەورەبوون لەگەڵ خۆیان دەیبەن، هەروەها چەندین ڕاپۆرتی باوەڕپێکراو هەیە کەوا دەیسەلمێنن یاریگاکان یەکێکن لە هەرە شوێنە گرنگەکان بۆ منداڵان لەدەرەوەی ماڵ.

ئەم ڕاپۆرتە هەوڵێکە بۆ هەڵسەنگاندنی کارکردنی یاریگای منداڵان و کێشەکانی لە شاری سلێمانی، لەبەر ئەم هۆکارە مەبەستی سەرەکی بریتیە لە هەڵسەنگاندن و دۆزینەوەی چارەسەر بۆ پێشخستنی یاریگاکانی منداڵان، لەبەر ئەوەی لە ڕێگەی گەڕان و خوێندنەوە لەسەر ئەم بابەتە بە پشت بەستن بە ستاندەرە جیهانیەکان کاریگەریە باشەکانی یاری و یاریگاکان دەرکەوتووە و کۆمەڵگا ڕادەکێشێ بۆ چالاکی جۆراوجۆر، وە ئاشکرایە کەوا یاریگاکان گرنگ و بە بایەخن لە شوێنە گشتەکانی گەڕەك و شارەکاندا نەك تەنها لەبەر ئەوەی شوێنی یاری و گەورە بوون بە منداڵان دەبەخشێت بەڵکو پاڵپشتە بۆ ژیان و چالاکیە گشتیەکان .

**کلیله وشه:** گۆڕەپانی یاری منداڵان، گەڕەکی نیشتەجێبوون، هەڵسەنگاندنی نیشتەجێبوون.

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

## Introduction

Playing is associated with children's behaviour, and it is well known that playing as a human activity is important for both individual and societal development. Among many activities available, children valued playing for its practical rather than aesthetic purposes (Latfi & Abdul Karim, 2010, p. 3). Children's playgrounds have improved since the nineteenth century in Europe and the United States of America, owing to the desire to keep children safe from street accidents and problems, as residential streets could be used for children's recreation.

Several factors influence children's play, including their age, interests, experience, type of play and equipment, physical and natural elements, their parents, safety, accessibility, variety, and attractiveness (Mamik, 2004, p. 26). Children have always enjoyed playing in their cities, towns, and neighbourhoods, particularly in the streets and yards near their homes. Playgrounds were recommended in the nineteenth century by developmental psychologists such as Friedrich Fröbel to teach children a sense of fair play and good manners.

While there were a few playgrounds linked to schools in Germany, the first purpose-designed public-access playground opened in 1859 in a park in Manchester, England. (Mamik, 2004, p. 18) Many European cities were destroyed after World War I, making it difficult to renovate them, particularly open green spaces and children's playgrounds. In the mid-twentieth century, Denmark and England invented new game ideas known as 'Junk playgrounds,' which were later improved to 'Adventure playgrounds. From 1939 to 1967, developers in Denmark changed the law, which reduced the number of time children spent walking to playgrounds, prompting the government to build more playgrounds. (Khazra, 2015, pp. 22-23).

Due to the advantages of the suitable children playgrounds, this study attempted to evaluate the appropriateness of a children's playground's performance in the city of Sulaymaniyah. As a result, the primary goal was to evaluate and find solutions related to improving the performance of children's playgrounds through investigation using criteria.

In the next sections there are literature review, methodology, children playground typaes, cases in the practical part, results, conclusion and recommendations.

## 1. Literature Review.

Arida in his study referred to urban design as a "Mixed discipline" that examines and influences the structure of cities as complex, organized systems of people, spaces, and connections, it works in the past, present, and future; it deals with individuals, groups, and society as a whole; it works for efficiency and satisfaction and is thus centred on the process of creating better places for people than would otherwise be produced (Arida, 2008, p. 7), also according to Clarence Perry, neighbourhood is a limited area about 64 hectares with a population of 5000 people, bordered, crossed by streets, include a primary school and other social, entertainment, shopping services in the centre for social, economic, environmental purposes and activity (Jasim, Farhan, & Attalla, 2018, p. 4) In many urbanized regions, public playgrounds have grown in importance as leisure spaces for young children and their families by providing supervised, cost-free, and ostensibly safe play areas for kids. (Lundman, 2021, p. 2).


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

Sio in his study supported documents of playground designs through a survey of influential playgrounds from the twentieth century, parallel with an analysis of current strategies and successful interventions by selected case studies of Dutch design firm Carve, to combine views from the past and the present to provide a reference for future works in the playground domain (Sio, 2018)**.** Khazra**,** studied children's playground places in Damascus city in Syria according to urban design level starting from large to a small open area, that identifies a specific age class serving and the game elements contain, which emphasises the importance of the game for the children focusing on the actual states, that stated and named suitability to the children's physical and psychological needs, and availability of safety and health requirement. (Khazra, 2015)**.**

## 2. Research Methodology.

This paper is classified as a (Post Occupancy Evaluation study); thus, several questions must be answered.

Are the design process and implementation for children's playgrounds of the residential neighbourhood units follow urban, architectural, and general requirements criteria?

Are Children's playgrounds in Sulaimanyah city facing failure in functional performance? And if so, is this failure led those children's playgrounds to be a useless projects?

To respond to these questions, the research adopted urban design criteria, architectural design criteria, and general design requirements in Sulaymaniyah city during the design, implementation, and maintenance process for a selected children's playground. That will set up a useful guideline criterion and a checklist for government and investment sectors that can use it during the design process, implementation and maintenance to prepare an adequate environment for children.

## 3. Children's playground typology

Depending on activities, and games type it can classify three types of children's playgrounds:

Traditional playground: Based on Spenser's concept 1873, This type of playground is intended to promote physical activity rather than creativity, such as running, jumping, and simple play instruments (Khazra, 2015, p. 23 to 25). The most common type of playground is the traditional type, which includes swings, seesaws, slides, and other standard equipment (Kaymaz, Oguz, & Hergül, 2015, p. 16). These playgrounds meet the requirement for physical activity while providing few opportunities for cognitive and social growth. These playgrounds limit the possibility of outdoor play to some extent and thus direct the children's attention and activities to standard equipment, limiting the children's right to explore the natural surroundings. (Stoiljković, 2006, p. 2)

Contemporary or modern playground: In the 1950s and 1960s, this type of playground became more popular with creative form and colour in an animal or other strange structure, this type of playground includes various types of games in one large structure made of various materials (Khazra, 2015, p. 23 to 25). The modern kind includes a so-called composite play structure, which is made up of several devices and types of equipment that are interconnected in such a way that they form a unity (superstructure). They are unusual, and more appealing to children than traditional ones because they

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

are more intriguing and demanding, and they also encourage educational types of play (Stoiljković, 2006, p. 2).

Sculptural or Abstract playground: Sculptural play items, which were introduced towards the end of the 1940s, were local playground equipment developed by artists and industrial designers who intended to enrich the landscape of playground planning via art (Stoiljković, 2006, p. 2) (fig.1). These items were designed with abstract shapes to encourage the child's imagination, provide a variety of play options, and enable many children to play concurrently inside a small space, (Sio, 2018, p. 26).

**Fig. 1,** Constructed by Tuffsen in 1949 at Stockholm's People's Park, (Sio, 2018, p. 26)

Continuous playground: Landscape playground designers succeeded to offer children a continuum play experience in an atmosphere of a total environment (Stoiljković, 2006, p. 2) in contrast to the vast majority of standardized playgrounds of isolated play equipment, which first emerged in the 1930s between sculptural experiments and aspiration for a richer public space (fig.2). The playground, which included topographic work, earth modulation, composite structures, sand, and water, aimed to provide children with a diverse play experience by linking spaces of varying heights to stimulate their physical and cognitive development (Sio, 2018, p. 34).

**Fig. 2,** continuous play model, (Sio, 2018, p. 34 and 35)


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

Linked playground: To better address children's play needs and social issues like juvenile delinquency, play environment designers started combining elements from both models of adventure and sculptural playgrounds (Stoiljković, 2006, p. 2) (fig. 3) in the middle of the 1960s. These designers were motivated by the vogue ideas of creativity in children's development and engagement with nature (Sio, 2018, p. 37), (Kaymaz, Oguz, & Hergül, 2015, p. 16).

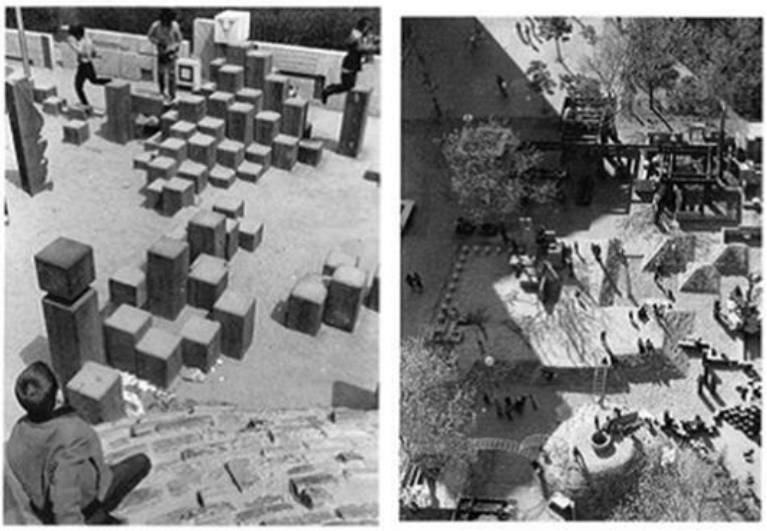

**Fig. 3,** Linked play model, (Sio, 2018, p. 38)

Adventure playground, (creative or exploratory playground): This type of playground was created in Denmark during World War II as a result of the architect C.Th. Sorensen noticing that kids were playing with items other than traditional playground equipment. Sometimes referred to as "Junk Playgrounds," these areas allow kids to create their own private spaces using discarded items like old tires, wood, sand, cables, stones, etc. (Khazra, 2015, pp. 23-25).

The creative type is made up of numerous components such as sand, water, vegetation, and rubbish. This range of elements provides a potential for play that encourages creativity, discovery, and manipulation with various materials (fig 4). Such playgrounds allow children to create their play objects, giving them a great deal of flexibility. They promote cognitive, physical, and psychological growth. The areas and environment in these playgrounds are informal and natural, stimulating a high quality of unimpaired playing and exploratory learning. (Stoiljković, 2006, p. 2)

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

**Fig. 4,** Junk playground in Emdrup, 1943, (Sio, 2018, p. 10)

## 4. Children's playground requirements and considerations:

Various disorders and accidents affect 10 to 30 million children and adolescents each year (Jafari, Salehi, & Naeini, 2011, p. 2). Expert teams should plan and design children's playgrounds, adhering to the numerous standards, recommendations, and requirements that determine the location, quality, and appearance of the equipment, the arrangement of the equipment, the type of material used for the protective surfacing, and so on (Stoiljković, 2006, p. 1). Specifically, potential injuries must be considered to minimize the risk, consideration should be given to several below points: (Kekovic, Petronijevic, & Ćurčić, 2019, p. 3), Follow international criteria and standards from design, implementation, management, and maintenance.

1) Variety of equipment and other design criteria related to the age of the users and the placement of playground equipment.
2) Operations during installation and upkeep/maintenance.
3) Size of openings to protect, heads, hands and legs from becoming entangled in them.
4) A protective surface layer that absorbs impact around or under the equipment is required.
5) The general danger posed by the jagged and sharp edges.
6) Possible falls from as well as around equipment.
7) Children use equipment that is either too large or too small for them.

The selection of materials must be based on several features of the unique play spaces, including equipment height, user age, element distribution, usual weather conditions, maintenance costs, installation costs, equipment lifetime, environmental issues, and other features. The playground surface is one of the most crucial parts of playground safety for preventing and avoiding major injuries caused by falls and tumbles, underneath swings and jungle gyms, inflexible surfaces like concrete and asphalt are unsuitable, also in any playground, open green space, and any places for


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

game and activities children should always be carefully monitored by a responsible adult or parents. (BSI, 2008), and (Housing, 2010)

## 5. Case Study.

### 5-1- Criteria and Method.

Urban design, Architectural design, and General design criteria are used to analyse and evaluate data by using (The Likert scale system) as a technic, which is usually applied to evaluate changes in attitudes, knowledge, perceptions, values, and behaviour. According to the checklist table prepared (table 1), if the score is within the range, it will get 2 points, and if it is near the range, it will get 1 point, otherwise, it will get 0 points, the evaluation process for children playground performance covered all criteria except hierarchy in Urban design criteria, Zoning in Architectural criteria, and design in General criteria, but it is necessary to mention it as a criterion for design and implementation purpose.

**Table 1,** Urban design, Architectural design, and general design criteria checklist detail (Researcher)

| Urban design criteria | | | | | | |
|---|---|---|---|---|---|---|
| | | Sq. | Sub-category 1 | Sub-category 2 | Brief Explanation | References |
| Category | Urban Design Criteria | 1 | Hierarchy | Children playground (6-11) Y. | Classification of playgrounds and different activities depending on the age of children. | (Housing, 2010) |
| | | | | Playfield (12-18) Y. | | |
| | | | | Open green area (All inhabitants) | | |
| | | 2 | Location on the site | Center | The centrality of the playground location serves and covers the maximum area. | (Ismaeel, 1998) |
| | | | | Sideward | | |
| | | 3 | Plot Area | (0.75) m²/person | According to the Iraqi criteria, those areas must be within these ranges. | (Housing, 2010) |
| | | | | Land area (600-900) m² | | |
| | | | | Game area (400-600) m² | | |
| | | 4 | Maximum Distance | Children's playground (200-300) m or (3-5) minutes. | According to the Iraqi criteria and standards, those distances must be within these ranges. | (Housing, 2010) |
| | | | | Playfield (500-800) m.l. | | |
| | | | | Open green area (800) m.l. | | |
| | | | | Children's playground and Trash zone (15) m.l. | | |
| | | 5 | Accessibility | Cross main street | According to the Iraqi criteria ease to access and crossing sub street is allowable, but the main street is not | (Housing, 2010) |
| | | | | Cross sub street | | |
| Architectural design criteria | | | | | | |

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

| Category | Architectural Design Criteria | Sq. | Sub-category 1 | Sub-category 2 | Brief Explanation | References |
|---|---|---|---|---|---|---|
| | | 1 | Safety | Material quality | Good material, monitoring by parents or guards, monthly maintenance and sun protection are required | (Housing, 2010), (BSI, 2008), (Abd Elrahman & Asaad, 2021), (Mamik, 2004), and (Ismaeel, 1998) |
| | | | | Flooring quality | | |
| | | | | Monitoring availability | | |
| | | | | Maintenance | | |
| | | | | Sun protection | | |
| | | 2 | Aesthetics | Game design and Colorful | Aesthetics and a Healthy environment are required | (Doğan, 2019), (Ismaeel, 1998), and (Khazra, 2015) |
| | | | | Cleanliness | | |
| | | 3 | Zoning | Age distribution | Age and Game Zoning in the playground to avoid an accident. | (Khazra, 2015) |
| | | | | Game type distribution (Mental and physical) | | |
| | | 4 | Disable needs | Walkway and rumps (Accessibility) inside and outside children's playground | Providing equal opportunity | (Khazra, 2015) |
| | | | | Equipment and games | | |
| | | 5 | Complementary elements | Trees and flowers | It is important to give children's playgrounds an attractive view and make them more sensible and healthier | (Khazra, 2015) |
| | | | | Water drinking points | | |
| | | | | Trash bag points | | |
| | | | | Fence and door | | |
| General design criteria | | | | | | |
| Category | General Design Criteria | Sq | Sub-category 1 | Sub-category 2 | Brief Explanation | References |
| | | 1 | Design | Design and planning residential neighbourhood units. | Design for children's playgrounds is required to avoid unused project | (Housing, 2010), and (BSI, 2008) |
| | | | | Design Children playground | | |
| | | 2 | Implementation | Implementation quality from the government and investment companies. | Good Implementation makes sure that the project is working well. | (Housing, 2010), and (BSI, 2008) |
| | | 3 | Supervising | Supervision level from the government | Good Supervising makes sure that the project is working well. | (Housing, 2010), and (BSI, 2008) |
| | | 4 | Participation | Inhabitants' participation from the design to the maintenance | Good Participation makes sure that the project is working well. | (Housing, 2010), and (BSI, 2008) |


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

**5-2- Sample**

Ten residential neighbourhood units in Sulaimanyah city randomly in the governmental and investment sectors were selected to be evaluated (fig 5); in the government sector they were (Harawazy, Ali Naji, Bakhtiary Taza, Bakhtiary Kon, and Nergz), and in the investment sector they were (Darwaza City, Shari Spee City, Chawr Chrai Nwe City, Hawari Zanko, and Barzaiakany Slemany).

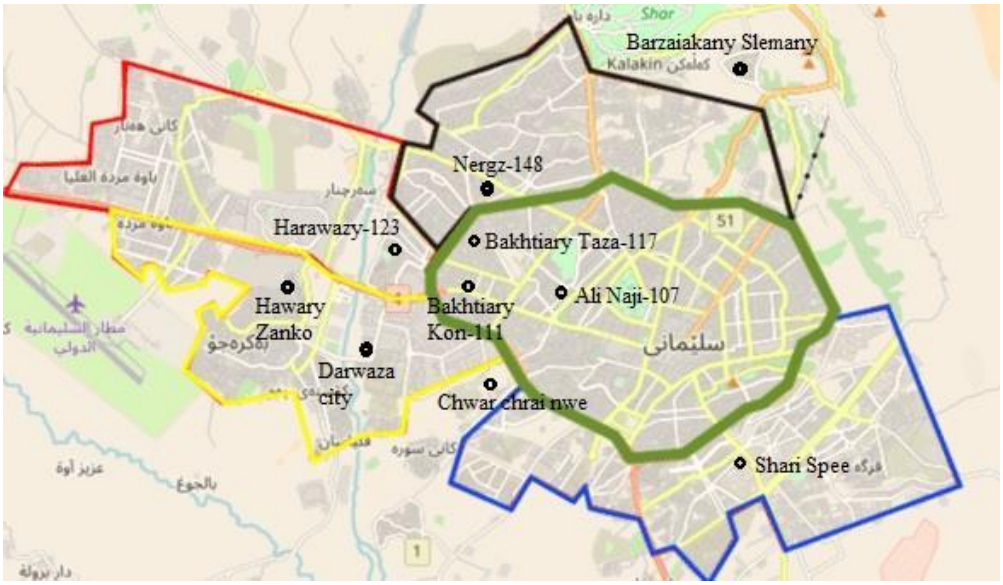


**Fig. 5,** Sulaimaniyah Municipality border and selected neighbourhood units (Prepared by the researcher)

Harawazy residential neighbourhood unit is one example of those neighbourhoods to implement the evaluation process mentioned previously. (Harawazy-123) has two primary schools as a centre of the neighbourhood unit (fig 6), therefore the neighbourhood unit is divided into northern and southern parts, in this case, the southern part was chosen. In the southern part, there are two parks, park1 is about (3043m²) and park2 is about (3384m²), with a total area equal to (6427m²), both parks have a children's playground and serve nearly (521) families. The area of both parks is bigger than what is required by Iraqi housing standard, both play area is about (159m²) ( Play area1 is about 77m² and play area 2 is about 82m²). Both parks are surrounded by a stone fence without suitable entrance, fair in the grass area and acceptable tress number (fig 7). Both parks are surrounded by sub-streets from three sides and the main street on one side, and both of them have flat topography with small different levels, with no distinguished architectural design (fig 8).

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

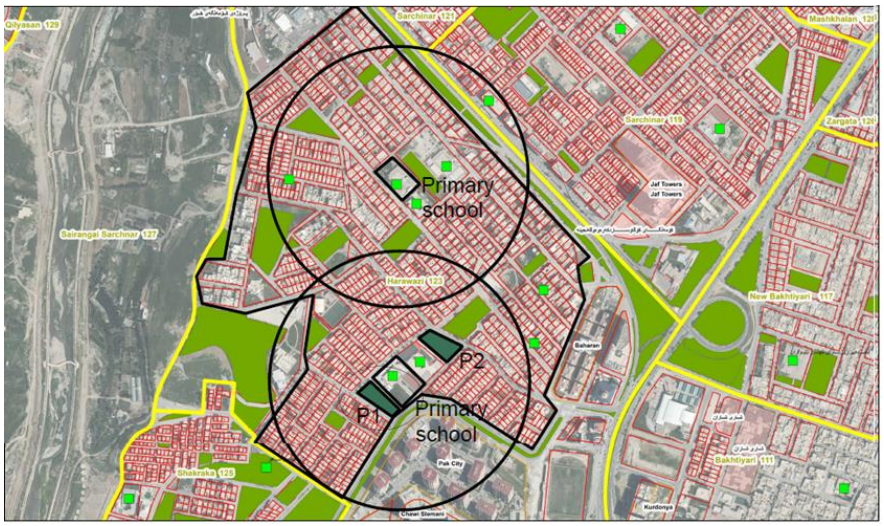


Fig. 6, Harawazy-123 neighborhood unit site plan, park1 and park2 location (Prepared by researcher)

Fig. 7, Shahid Anwer Dartash (Park1) (Researcher)

Fig. 8, Shahid Husain Yarwaisy (Park2) (Researcher)


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

**Table 2,** Park1 & park 2 evaluation in (Harawazy-123) (Researcher)

| Category | Sq. | Sub-Category 1 | Sub-Category 2 | Scoring | | | Subtotal score | Note |
|---|---|---|---|---|---|---|---|---|
| | | | | Good | Average | Poor | | |
| Urban Design Criteria | 1 | Location | Center or Sideward | 2 | | | 2 | Center |
| | 2 | Area [m²] | (0.75) m²/person | 2 | | | 2 | 6427m²/(521*6)=2.05 m² per person |
| | | | Land Area (600-900) m² | | 1 | | 1 | P1 3043+P2 384=6427m² |
| | | | Game Area (400-600) m² | | | 0 | 0 | P1 77+P2 82 =159m² |
| | 3 | Distance | Maximum (200-300) m | 2 | | | 2 | The majority of houses covered |
| | | | Minimum distance to trash zone (15)m, or electrical generator | | | 0 | 0 | A trash point does not exist near the children's playground, but there is an electrical generator near both parks |
| | 4 | Accessibility | Cross main or sub street | 2 | | | 2 | Cross sub street |
| Architectural Design Criteria | 5 | Safety | Material quality | | 1 | | 1 | Medium level, plastic |
| | | | Flooring quality | | 1 | | 1 | Medium-level rubber tile |
| | | | Monitoring availability | | | 0 | 0 | Monitoring not available |
| | | | Maintenance | | | 0 | 0 | Not available |
| | | | Sun protection | | | 0 | 0 | Not available |
| | 6 | Aesthetic | Game design and Colorful | | 1 | | 1 | Medium level |
| | | | Cleanliness | | 1 | | 1 | Medium level |
| | 7 | Disable needs | Walkway and rumps | | | 0 | 0 | Not available |
| | | | Equipment and games | | | 0 | 0 | Not available |
| | 8 | Complimentary elements | Trees and Flowers | | 1 | | 1 | Medium level |
| | | | Water Drinking points | | | 0 | 0 | Not available |
| | | | Trash bag points | | | 0 | 0 | Not available |

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Fence and Entrance | | | 0 | 0 | Not available |
| G. D. Criteria | 9 | Quality of Implementation | Quality of Implementation from government or/and investment companies | | | 0 | 0 | Low level |
| | 10 | Quality of Supervising | Quality of Supervising from government or/and investment companies | | | 0 | 0 | Low level |
| | 11 | Participation | Participation Between Parents and Designers | | | 0 | 0 | Low level |
| Total Score | | | | | | | 14 | |
| The Typical Total Score is equal to 46 Points (**0-15=Poor**, 16-31=Acceptable, and 32-46=Good), the ranges prepared by researcher. | | | | | | | | |

## 5-3- Results.

There is a significant variation in the scoring for each playground based on the evaluation results for all three aspects. Except for trash distance, which is less than the accepted range, all urban design criteria data are within standard ranges. For the architectural design criteria, data are varied, for example, material quality is at a high level, monitoring, colourful design, tress and flower are within the range, but the other criteria are out of the range. For the general design criteria, data are mostly out of the accepted range, and implementation quality, supervising quality and participation are all less than the standards. The comparison between the real scoring of the sample cases and the standard ranges is shown in the following figures (fig 9-18).

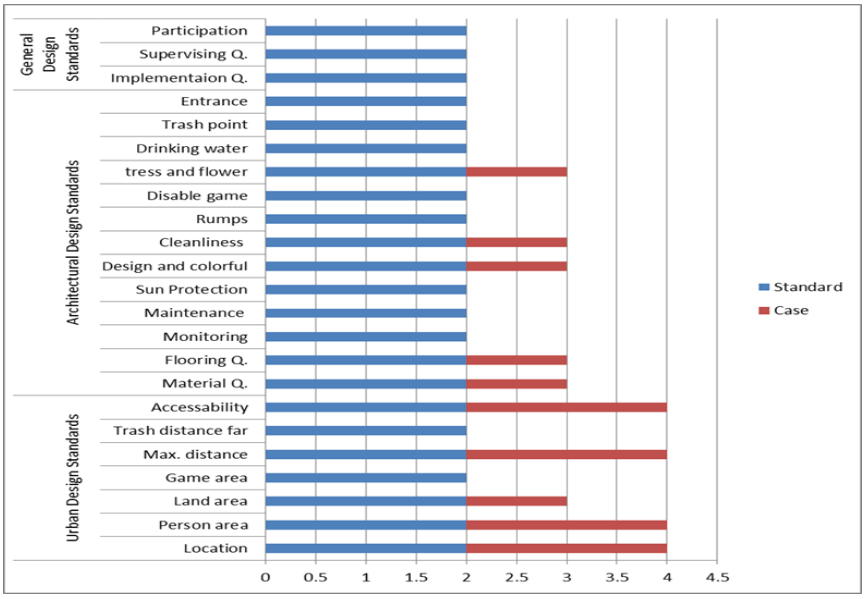


**Fig. 9,** Urban design, Architectural design, and general design criteria, (Harawazy-123) (Researcher)


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

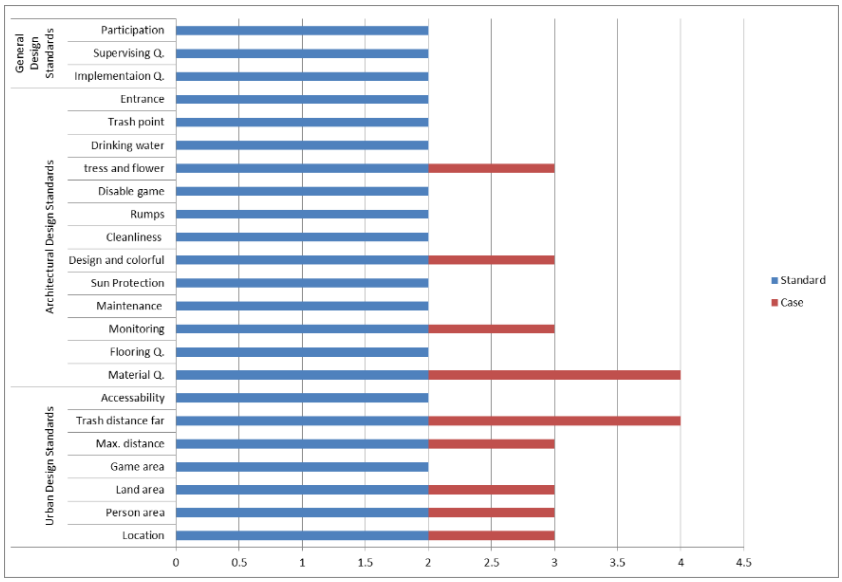


**Fig. 10**, Urban design, Architectural design, and general design criteria, (Ali Naji-107) (Researcher)

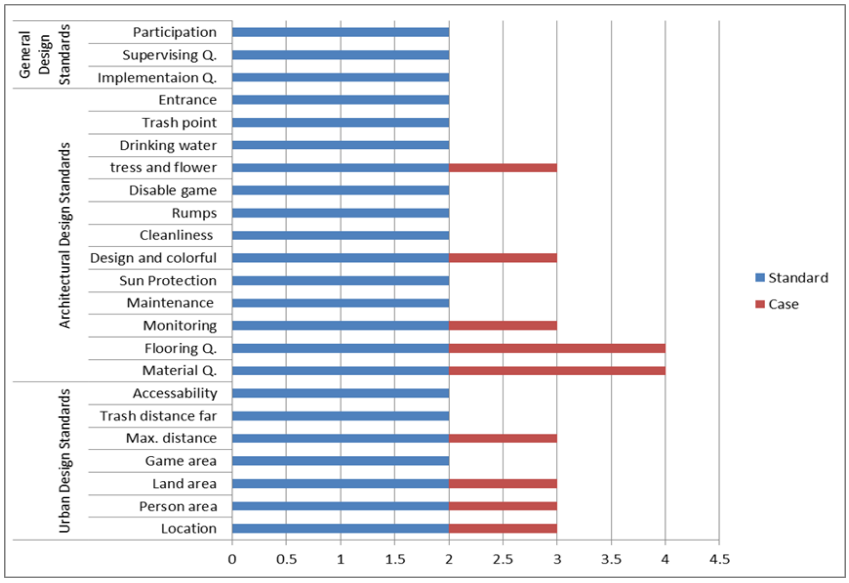


**Fig. 11,** Urban design, Architectural design, and general design criteria (Bakhtiary Taza-117) (Researcher)

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

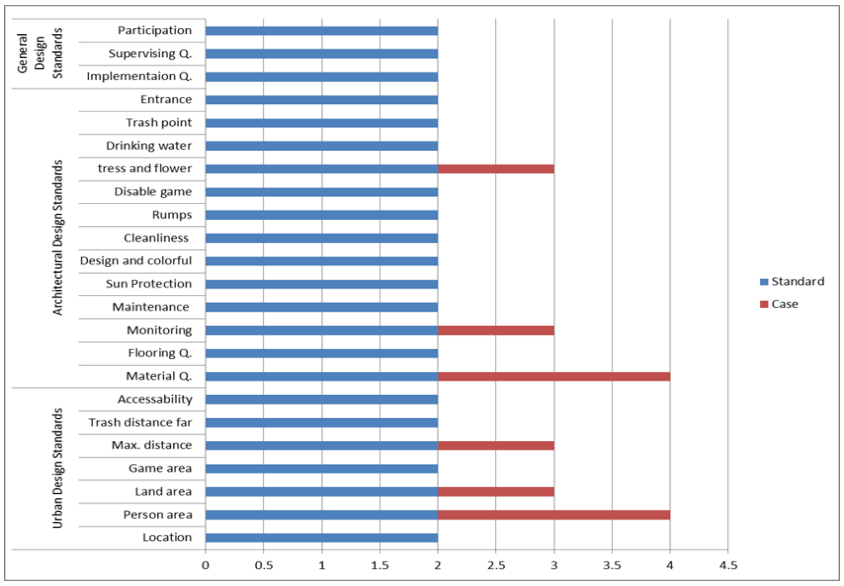


**Fig. 12,** Urban design, Architectural design, and general design criteria (Bakhtiary Kon-111) (Researcher)

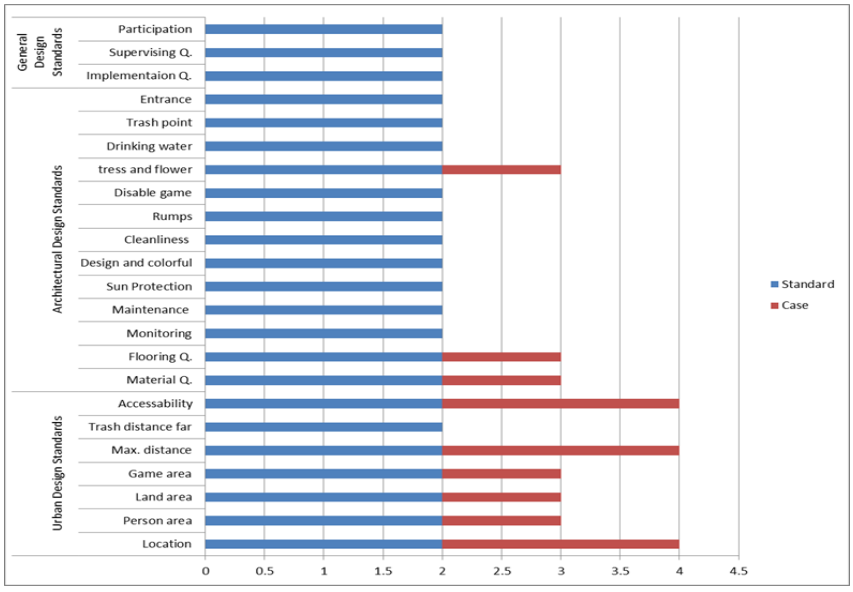


**Fig. 13,** Urban, Architectural, and general design criteria (Nergz-148), (Researcher)


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

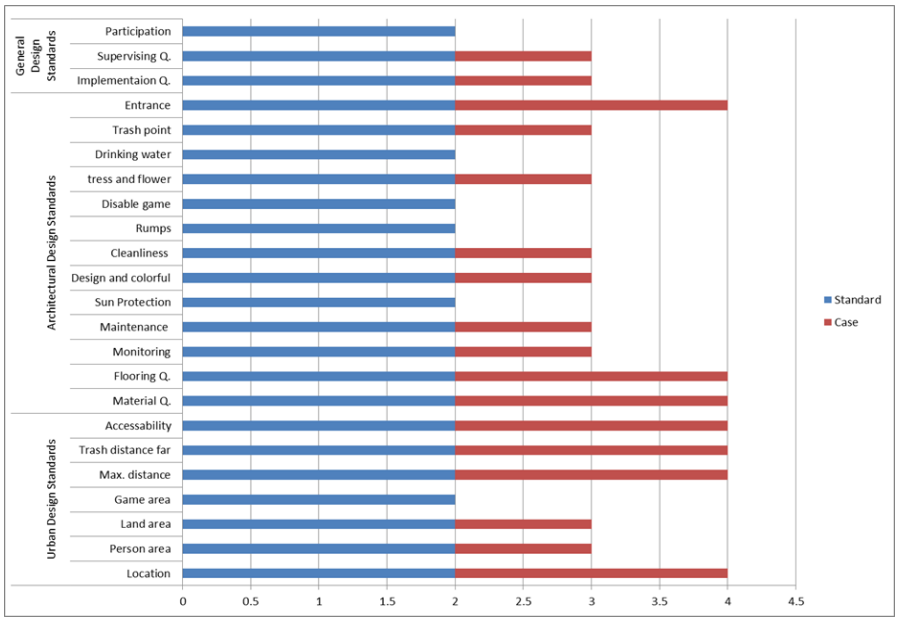


**Fig. 14,** Urban design, Architectural design, and general design criteria (Darwaza City), (Researcher)

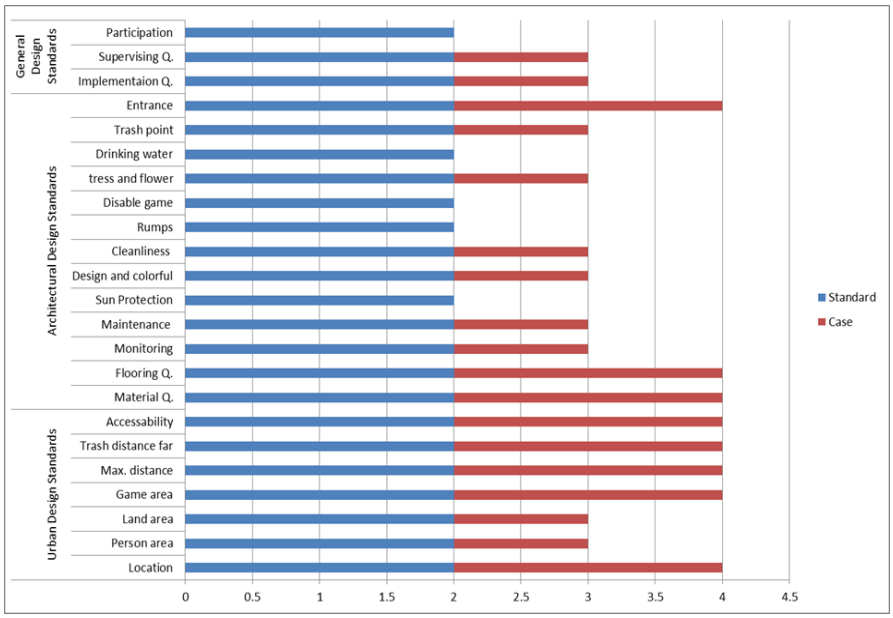


**Fig. 15,** Urban design, Architectural design, and general design criteria (Sharee Spi), (Researcher)

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

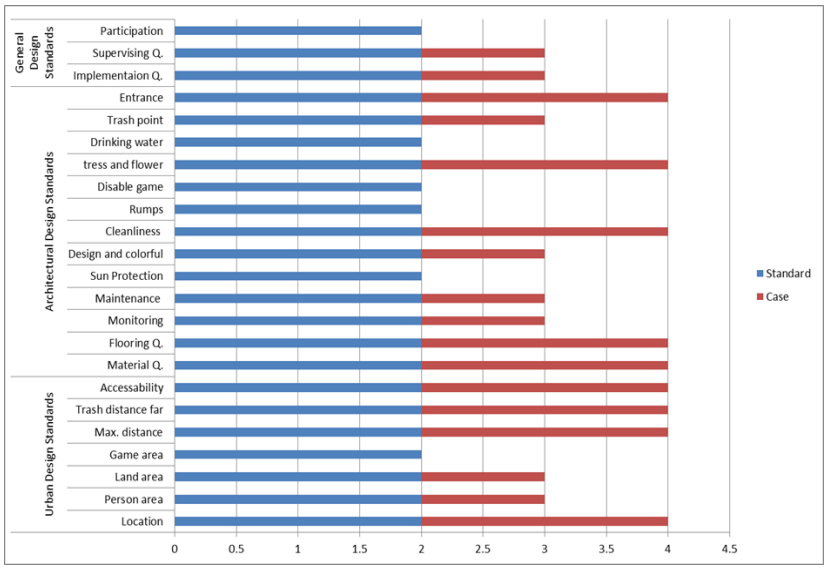


**Fig. 16,** Urban design, Architectural design, and general design criteria (Chwar Chrai New city), (Researcher)

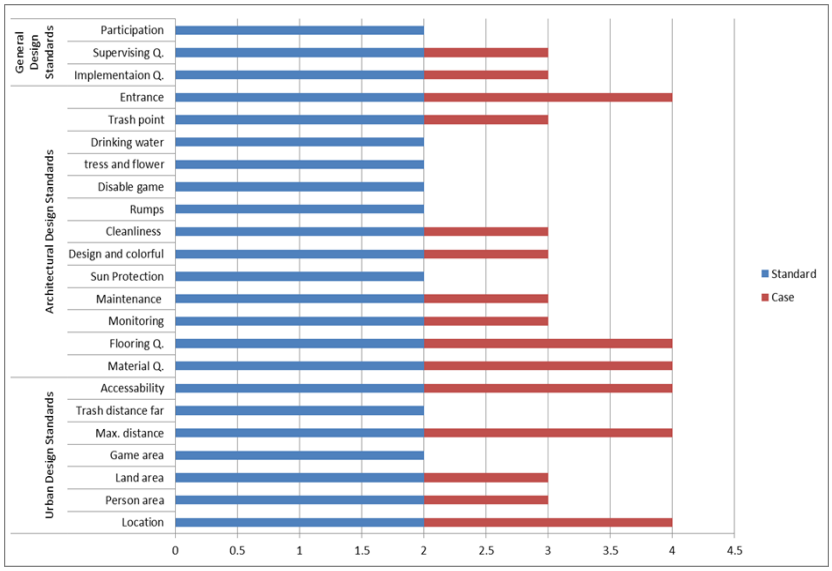


**Fig. 17,** Urban design, Architectural design, and general design criteria (Hawary Zanko city), (Researcher)


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

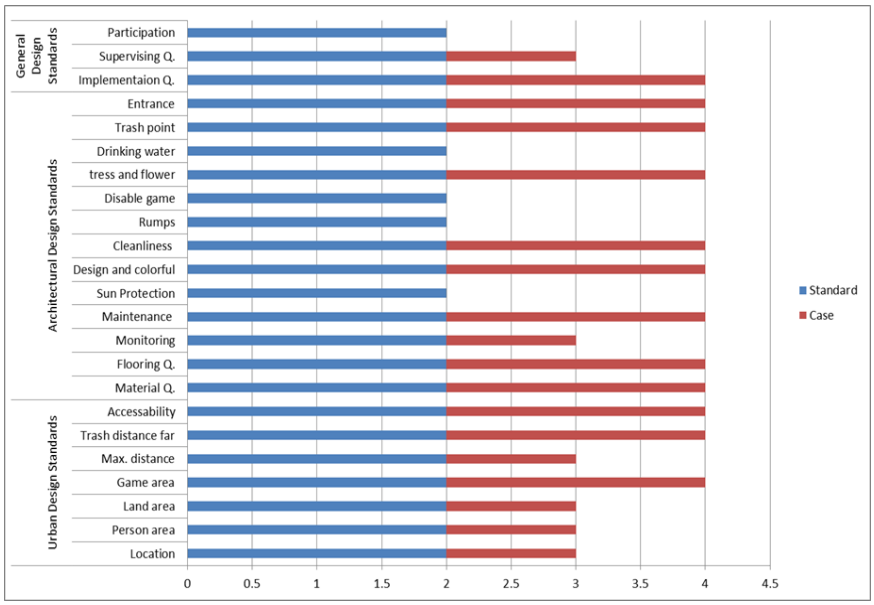


**Fig. 18,** Urban design, Architectural design, and general design criteria (Barziakany Slamany), (Researcher)

## 5-4- Discussion

**Table 3,** Criterion ratio for government neighbourhood unit (Researcher)

| Category | Sub Category | Neighborhood units score | | | | | Scoring | | | Criterion implementation ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Harawazy-123 | Ali Naji-107 | Bakhtiary Taza-117 | Bakhtiary Kon-111 | Nergz-148 | Good(2) | Average(1) | Poor(0) | |
| Urban Design Criteria | Location | 2 | 1 | 1 | 2 | 0 | 2 | 2 | 1 | 60% |
| | Person area | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 0 | 70% |
| | Land area | 1 | 1 | 1 | 1 | 1 | 0 | 5 | 0 | 50% |
| | Game area | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 10% |
| | Max. distance | 2 | 1 | 1 | 2 | 1 | 2 | 3 | 0 | 70% |
| | Trash distance far | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 4 | 20% |
| | Accessability | 2 | 0 | 0 | 2 | 0 | 2 | 0 | 3 | 40% |
| Architectural Design Criteira | Material Q. | 1 | 2 | 2 | 1 | 2 | 3 | 2 | 0 | 80% |
| | Flooring Q. | 1 | 0 | 2 | 1 | 0 | 1 | 2 | 2 | 40% |
| | Monitoring | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 2 | 30% |
| | Maintenance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Sun Protection | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Design and colorful | 1 | 1 | 1 | 0 | 0 | 0 | 3 | 2 | 30% |
| | Cleanliness | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 10% |
| | Rumps | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Disable game | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Tress and flower | 1 | 1 | 1 | 1 | 1 | 0 | 5 | 0 | 50% |
| | Drinking water | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Trash point | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Entrance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| General Design Criteria | Implementaion Q. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Supervising Q. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Participation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| Neighborhood imple. ratio | | 30% | 24% | 24% | 26% | 17% | | | | |

As it is shown in (table 3) criteria ratios are ranged between (minimum %0 to maximum %80), the good ratios are (location=%60, person area=%70, Max. distance=%70, and material quality=%80), the medium ratios are (land area=%50, and tress-flower=%50), and the low ratios are (game area=%10, Trash distance far=%20, Accessibility=%40, flooring quality=%40, monitoring=%30, design-colorful=%30, and others criteria=%0), (Researcher).

DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

**Table 4:** Criterion ratio for investment neighbourhood unit (Researcher)

| Category | Sub Category | Neighborhood units score | | | | | Scoring | | | Criterion implementation ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Darwaza City | Sharee Spi | Chwar Chrai New city | Hawary Zanko city | Barziakany Slamany | Good(2) | Average(1) | Poor(0) | |
| Urban Design Criteria | Location | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 90% |
| | Person area | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 0 | 50% |
| | Land area | 1 | 1 | 1 | 1 | 1 | 0 | 5 | 0 | 50% |
| | Game area | 0 | 2 | 0 | 0 | 2 | 0 | 1 | 4 | 40% |
| | Max. distance | 2 | 2 | 2 | 2 | 1 | 2 | 3 | 0 | 90% |
| | Trash distance far | 2 | 2 | 2 | 0 | 2 | 1 | 0 | 4 | 80% |
| | Accessability | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 3 | 100% |
| Architectural Design Criteira | Material Q. | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 0 | 100% |
| | Flooring Q. | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 100% |
| | Monitoring | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 2 | 50% |
| | Maintenance | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 5 | 60% |
| | Sun Protection | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Design and colorful | 1 | 1 | 1 | 1 | 2 | 0 | 3 | 2 | 60% |
| | Cleanliness | 1 | 1 | 2 | 1 | 2 | 0 | 1 | 4 | 70% |
| | Rumps | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Disable game | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Tress and flower | 1 | 1 | 2 | 0 | 2 | 0 | 5 | 0 | 60% |
| | Drinking water | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| | Trash point | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 5 | 60% |
| | Entrance | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 5 | 100% |
| General Design Criteria | Implementaion Q. | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 5 | 60% |
| | Supervising Q. | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 5 | 50% |
| | Participation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0% |
| Neighborhood imple. ratio | | 52% | 57% | 57% | 46% | 65% | | | | |

As it is shown in (table 4) the criteria ratio, are ranged between (minimum %0 to maximum %100) the good ratios are (location=%90, Max. distance=%90, trash distance far=%80, accessibility=%100, material quality=%100, flooring quality=%100, maintenance=%60, design-colorful=%60, cleanliness=%70, tress-flower=%60, trash point=%60, entrance=%100, and implementation=%60), but the medium ratios are (person area=%50, land area=%50, monitoring=%50, and supervising quality=%50), and the low ratios are (game area=%40, and others criteria=%0), (Researcher).


DOI: http://dx.doi.org/10.25098/8.1.25

*The Scientific Journal of Cihan University – Sulaimaniya* **PP: 46-67**
Volume (8), Issue (1), June 2024
ISSN 2520-7377 (Online), ISSN 2520-5102 (Print)

## 6. Conclusion and Recommendations

It is obvious that the performance of the children's playground is very important to the child's health; a good children's playground increases a child's activity and helps to build a perfect body physically; additionally, it helps the child to grow his/her mentality in a proper manner. As a social activity, the playground helps the child connect with his/ her friends. Another benefit is the connection with nature and the environment, which helps the child avoid being sedentary at home and gaming with new technology. To assess the effectiveness of ten neighbourhood playgrounds, the paper looks at three factors related to their arrangement and design: urban design criteria, architectural design criteria, and general requirement criteria.

For the governmental sector, in urban design criteria location, personal area, and max. distance got a good score, the location and the land area got a medium score, but the game area, distance from trash or (electrical generator), and accessibility criteria got a bad score. In Architectural design criteria, the material quality got a good score, tress-flowers got a medium score, but flooring quality, monitoring, maintenance, sun protection, colourful design, clean lines, rumps, disabled games, drinking water, trash point, and entrance, got a bad score. In general criteria, there is zero level practice for implementation quality; supervising quality and participation process therefore they got zero scores.

For the investment sector, in urban design criteria location, Max. Distance, trash distance, and accessibility got a good score, but the personal area, land area and game area, got a medium score. In Architectural design criteria, material quality, flooring quality and entrance got a good score, monitoring, maintenance, colourful design, cleanliness, tress-flowers and trash points got a medium score, but sun protection, rumps, disable games and drinking water got zero scores. In general criteria, implementation quality, and supervising quality got a medium score, but the participation process got a zero score.

To overcome problems and improve the design and implementation of children's playgrounds, it is necessary to know that the main concept of city planning must designed by urban planners, urban designers, architects, and other specialties in different science branch to achieve perfect site plan of the city, to lead design and implement children playgrounds in a well-organized shape and number in neighborhood units, as one of people’s need, therefore the paper recommend:

1. All standards and criteria from city planning, residential neighborhood unit, open green area, and children playgrounds must be reformed to cover all aspects and domains in the city for new projects, children playground as a one need’s example.
2. Apply reformed standards and criteria on exist projects to develop and improve their performance.
3. Government sector must take city planning and master plan of the city as a serious process depending only on the standards, criteria and experts without all outside affects to achieve all population needs equally.
4. Gardens department in Sulaimaniyah municipality must be responsible not only for the gardens and open green areas but to the children playgrounds also, as a design, implement, supervising, management and maintaining in government and investment sectors.

DOI: http://dx.doi.org/10.25098/8.1.25

5. Government sector must push and support investment companies to offer idea in the shortage field, to be useful project and fill this lack, and obliges about all agreements.
6. Children playgrounds must design, implement, and maintain properly (by government and investment sectors) to achieve perfect performance to get benefit for child physically and mentality.
7. Participate parents and child in the design process, which makes the process more virtually.

**References**

1- Abd Elrahman, A. S., & Asaad, M. (2021). Urban design & urban planning: A critical analysis to the theoretical relationship gap. Ain Shams Engineering Journal, 12(1), pp. 1163-1173. https://doi.org/10.1016/j.asej.2020.04.020
2- Arida, A. (2008). Urban Design (1093 words). London.
3- BSI. (2008). Playground equipment and surfacing. Brussels: British Standards Institution.
4- Doğan, U. (2019). Assessing the Urban Design Quality of Turkish Cities. Kayseri, Turkey: IntechOpen. http://doi.org/10.5772/intechopen.89779
5- Housing, S. C. (2010). Urban Design Criteria Notebook. In C. department, Urban Design Criteria (p. 41). Baghdad: Ministry of housing and construction.
6- Ismaeel, S. T. (1998). Designed Children Playground, Effect of design variables on children playground performance in residential neighborhood units. Architectural Department, Baghdad University, Unpublish master thesis.
7- Jasim, I. A., Farhan, S. L., & Attalla, A. T. (2018). Sustainable neighborhood Comparative Analysis of Al-Kut Neighborhoods. Journal of University of Babylon for Engineering Sciences, 26(9), pp. 302–317.
8- Kekovic, A., Petronijevic, A. M., & Ćurčić, A. (2019). Designing of children playgrounds from the aspect of used surfacing with a goal of children safety on the example of the City of Nis. Facta universitatis - series Architecture and Civil Engineering Journal, 17(1), pp. 69-80. https://doi.org/10.2298/FUACE190123001K
9- Khazra, S. (2015). The Design principles and criteria for Children's playgrounds in Residential Neighborhoods. Architectural. Case study Damascus city: Damascus University, Unpublish master thesis.
10- Mamik, N. H. (2004). An Evaluation of the Changing Approaches to Children's Play Spaces. City and Regional planning. Ankara: The Middle east technical university, Unpublish master thesis.
11- Sio, J. Â. (2018). Playground design: children's play spaces in the city from the 1930s up to the present day. Architectural. Amsterdam: Universidade de Lisboa, Unpublish master thesis.
12- Kaymaz, I., Oguz, D., & Hergül, Ö. C. (2015). A Discussion on the Use of Children Playgrounds in Urban Parks: An Observational Study. In "International Play and Toy Congress", Book of Proceedings, pp. 775-785, Erzurum, Türkiye.
13- Jafari, H., Salehi, E., & Naeini, S. (2011). Playground Safety: An Approach to Environmental Planning. Journal of Environmental Studies, 36(56), 4.


DOI: http://dx.doi.org/10.25098/8.1.25

14- Stoiljković, B. (2006). Functional and Organization of Children Playgrounds in the Housing Estates. Architecture and Civil Engineering Journal, 4(2), pp.115-125. https://doi.org/10.2298/FUACE0602115S

15- Lundman, R. (2021). Coping with Standards: Integrating Art and Safety into the Design of a Creative Playground. Journal of Planning Education and Research ACSP, 10. http://doi.org/10.1177/0739456X21994650.

16- Latfi, M. F., & Abdul Karim, H. (2010). Suitability of Planning Guidelines for Children Playing Spaces. Procedia - Asia Pacific International Conference on Environment-Behaviour Studies, Kuching, Sarawak, Malaysia, 7-9 December 2010, pp. 304-314. http://doi.org/10.1016/j.sbspro.2012.03.352

DOI: http://dx.doi.org/10.25098/8.1.25