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The mutual influence between human behaviors and needs with urban planning and character architecture

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Abstract:

The basic need for humans is the built environment to live in it. The built environment is the source of feeling comfortable and safe for humans. Therefore, it is very important to give its design and urban planning a lot of attention. Human behaviors have a very important role in affecting the built environment. Additionally, its effect on visual aspects of the district. Also, urban planning and design of the built environment influence human behavior. So, it is necessary to study human behavior, and culture and needs design and plan according to that. Therefore, the study will include the mutual influence between Human behaviors and needs with urban planning and character architecture of the El Masaid district; in El Arish; North Sinai; Egypt. So, the study contains two phases the first phase analyses the urban planning of this district and comparison the three-phase of planning, The second phase analyses the mutual influence of architectural character and Human behaviors and needs. The finding will explain the changes in appearance in urban planning and architectural character after population use, and the effect of the design on human behavior. Also, it accesses principles to take into consideration in the design and urban planning of residential areas for the population in this area, which is suitable with their culture, behavior, and needs.

Keywords: Human behavior; Urban planning; Architecture character; human needs.

1. Introduction

The main role of urban planning and design is to meet the needs of the group and the individual (social, economic, human, and civilized). The individual needs of humans are tangled and complex [1]. Therefore, it is not easy to meet these needs without carefully studying them. Human activity is the reason for human needs [2]. Also, Aesthetic matters have differences in opinions between society and architects. Additionally, Modernist ideas of city buildings had been proved to be lowest than perfect [3].

Nowadays, more than half of the world's population (55%) lives in urban areas, and by 2050, this proportion is expected to rise to 68% [4]. urban design should ensure producing high-quality living environments that add environmental, social, and economic value [5]. the urban built environment continues to expand and increase demand for various types of buildings such as residential and commercial because the world continues to urbanize [6].

The architectural characters give the building its visual character and that should be considered. the overall BUILDING visual aspects consist of Shape, Roof and Roof Features, Trim and Secondary Features, Openings, Materials, Projections, and Setting [7]. According to the building functional diversity, one study cannot be enough to explain the characteristics of Architecture style in the city. so, it should focus on residential houses [8]. All previous architectural characteristics influenced the human uses of buildings. Meeting the needs of its intended users is One of the main challenges architects faces during the design process [9]. Designers and planners should be understood how people act cognitively, psychologically, and socially in their physical environment [10]. Therefore, it is a challenge in front of architects and facilitators to understand user expectations' dynamic nature [11]. The built environment had indirect and direct effects on psychosocial and mental health [12] [13]. Because Design influenced human moods,

senses, behavior, and emotions [14]. Additionally, people modify the built environment actively to match their needs by acting collectively or individually [15].

All previous studies had explained the main public Standards for urban planning and architecture design but scarcely studies included human behavior. However Human behavior has an important role in urban planning and architecture design and the effect is mutual between them. So, it should make studies explain the mutual effect of human behavior on urban planning and architecture design for every Community's culture, manners, and conventionalism. Which will give Standards for urban planning and architecture design according to the human behaviors and needs of every society. This study will explain the role of urban planning and architecture design to change human behavior either negatively or positively in El Masaid district; El Arish; North Sinai; Egypt. Also, the effect of human behavior on urban planning and architecture design. To but some Standards and roles for designing the building and urban places to harmonize with the culture, needs, and requirements of the population in this city.

2. Methodology

This paper will Analyze the urban planning of the El Masaid district; in El Arish; North Sinai; Egypt. Also, it will Analyze the Architectural Character of this district. After that will compare the main design for the building in this district and this building after the population uses it. Additionally, know the differences which appear in the character of visual architecture for this building. Therefore, it had been accessed to the effect of human behavior, culture, and needs in the built environment. Also, know the effect of urban planning and architectural character on human behavior.

This paper included two phases. The first phase analyzed the urban planning of this district and compared the main urban planning with the construction in the year 1982 and after use in the year 2010 and the year 2022. Then, the second phase analyses the mutual influence of Architectural Character and Human behaviors and needs at two levels. The first level depends on the character architecture of the building and the effects of human behaviors on it. The second level depends on the effect of urban planning and design building on human needs according to Maslow's hierarchy of needs [13].

The first phase analyzed the urban planning of this district

This part has explained the location of the El Masaid district in the city and its relationship with the center of the city. Also, it had been compared between the main urban planning and the constructed plan. Additionally, it had been compared between the three-phase of planning.

Location

The El Masaid district is one of the first places that has been planned after returning Sinai to Egypt. It had been planned and constructed in the year 1982. Then it had been renovated in the year 2020 as explained in Figure 1. This district is located far from the center of the city 9 kilometers as explained in Figure 2. Also, it is considered the first district at the entrance of El Arish city. Additionally, it has a lot of public buildings around it, the main building that has a big effect on this district is the university building.



Figure 1. Explain the El Masaid district after maintenance and development before being delivered to the population.



Figure 2. Explain the location of The El Masaid district and its relationship with the center of the city from google earth 2022.

The planning design:

This place has been designed and contracted to provide expatriates with a stable place for life. Additionally, the design has included two types of housing (affordable housing- low-income housing). The total number of housing units is 105 units. Figure 3 explains the main urban planning for the El Masaid district from Arab BUREAU for Design and Engineering Consultation in the year 1982 and the current situation for the El Masaid district from google earth 2022. Figure 4 explains the comparison between the three-phase for the planning. Phase one is The main urban planning in the year 1982, phase two after use In the year 2012, and phase three is after renovation in the year 2020.

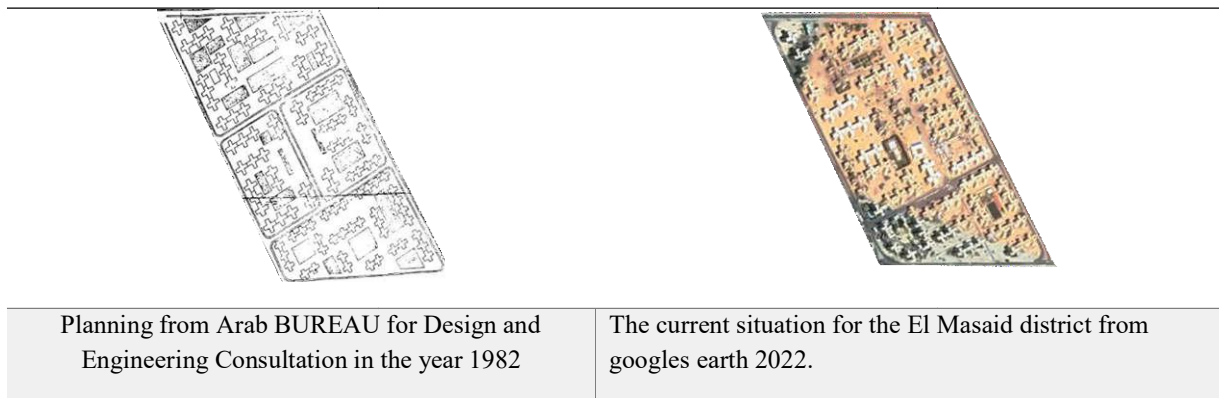


Figure 3. Explain The Urban planning for the El Masaid district the main planning and the implementation.



Figure 4. Explain the comparison between the three phases of Urban planning for the El Masaid district.

This comparison between the three phases included (Road - The shape of the residential housing group – Description - Landscape and service). Figure 5 explains the comparison road ratio between the three phases and explains the appearance change in the planning during these phases. Figure 6 explains the comparison of The shape of the residential housing group and the privacy ratio between the three phases of Urban planning. Figure 7 explains the comparison of Landscape and service between the three phases of Urban planning for the El Masaid district.

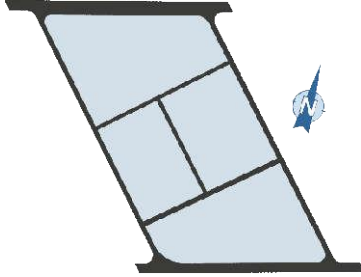
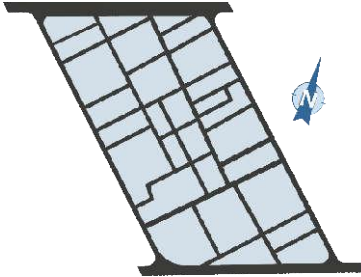
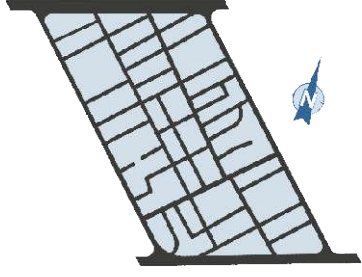
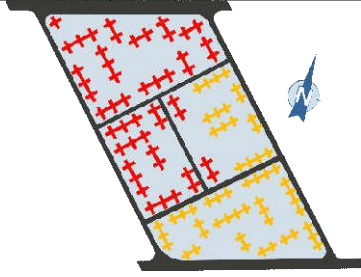
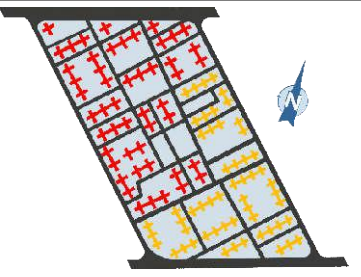
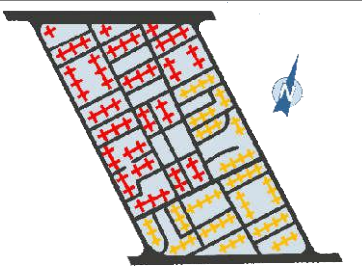
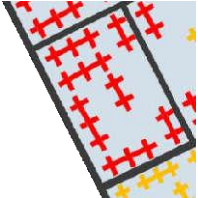
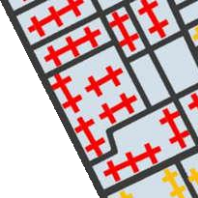
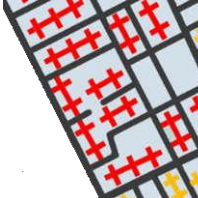
The planning In the year 1982	The planning In the year 2012	The planning In the year 2022
		
In the main planning has been designed the district to contain Three roads. The road ratio from the total area is 3.97%	In the planning after construction and use, a lot of roads have been found. The road ratio from the total area is 16.44%	In the planning after maintenance and the development of the district, the roads have been increased. The road ratio from the total area is 19.66%

Figure 5. Explain the comparison road ratio between the three phases of Urban planning for the El Masaid district.

The planning In the year 1982	The planning In the year 2012	The planning In the year 2022
		
In this planning, the residential housing had been designed in groups. The group did not find any road path through these groups.	the design planning didn't construct as had been designed. Which affected The shape of residential housing groups. Also, the number of residential housing groups had been decreasing.	the increasing of roads decreases the number of residential housing groups. Additionally, that has been spent on Privacy and Safety in the landscape between buildings.
		

The detail in part of the district explains the difference between the main urban planning and which has been constructed.

Figure 6. Explain the comparison of The shape of the residential housing group and privacy ratio between the three phases of Urban planning for the El Masaid district.

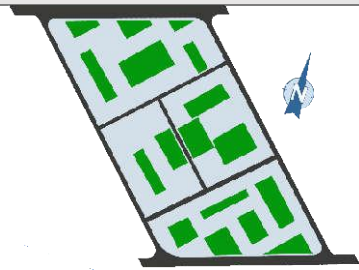

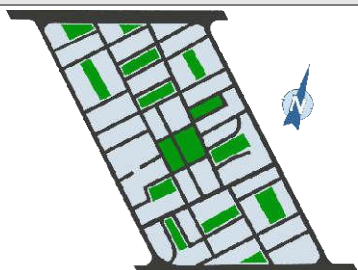
The main urban planning	In the year 2012	In the year 2022
		
The ratio of landscape and service to the district's land area is 27.9%.	The ratio of landscape and service to the district's land area is 17.9%.	The ratio of landscape and service to the district's land area is 13.3%.

Figure 7. Explain the comparison of Landscape and service between the three phases of Urban planning for the El Masaid district.

The second phase analyses the mutual influence of Architectural Character and Human behaviors and needs.

The essential visual qualities and character could be given to the building through the identified architectural character of the building. The architectural character includes shape, roof and roof features, openings, projections, trim and secondary features, materials, and settings [7]. The Figures below has discussed all the architectural characteristics of the buildings after construction without population use. Also, it has been compared with differing appearances of the building after population uses as explained in Figures 8-14.

The building shape of the building had been designed simply as a plus (+) shape. That shape gives the building its simple identity. Also, All the buildings in the district have the same height and shape. The shape is distinctive from the neighboring buildings. Additionally, adding a porch has given changes to that character. The ground floor has been designed to be open parking. After people use this building made some changes to meet their needs. The ground floor of the building has been closed in some buildings. It has been used as an apartment in some residential buildings. additionally, these have been used as shops in others. That has been done to provide for the needs of the population. As explained in Figure 8.

Main design	After used
 <p>Plan of building</p> 	

Figure 8. Explain and compare the shape of the building after use and before use.

The biggest space on the roof is flat didn't have any slope. the part of the stairs is only higher than the other part of the roof. Additionally. It is located at the center of the building and didn't have natural ventilation and lighting. the roof of the stairs has dormers on it. the population hasn't used the roof for personal things of their day uses because it didn't contain shaded places. So, the design of the roof hasn't changed. As explained in Figure 9.

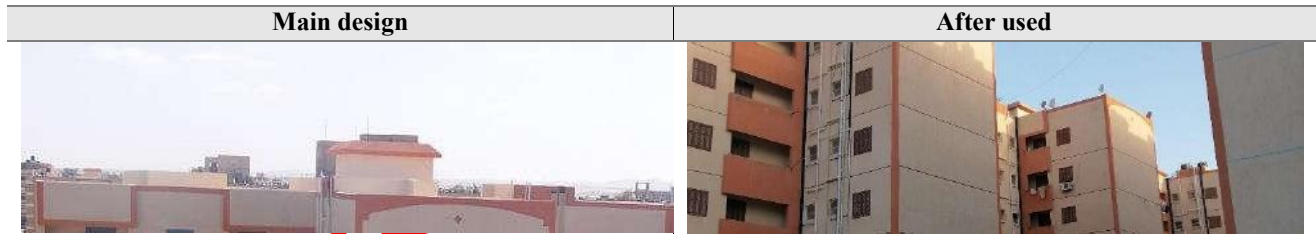


Figure 9. Explain and compare the Roof and Roof Features of the building after use and before use.

The windows take shape of a rectangle. The windows and porches had been arranged as lines vertically in the wall. The window ratio in the wall is small. It had to take a quarter space of elevation. The porches take up two-thirds of the wall which is found in it. The absence of windows had appeared on some walls. The window has shutters wood. Some people open windows in the walls which have been designed without windows. These new windows do not have the same shape and didn't have the same size. Additionally, it has different materials. As explained in Figure10.

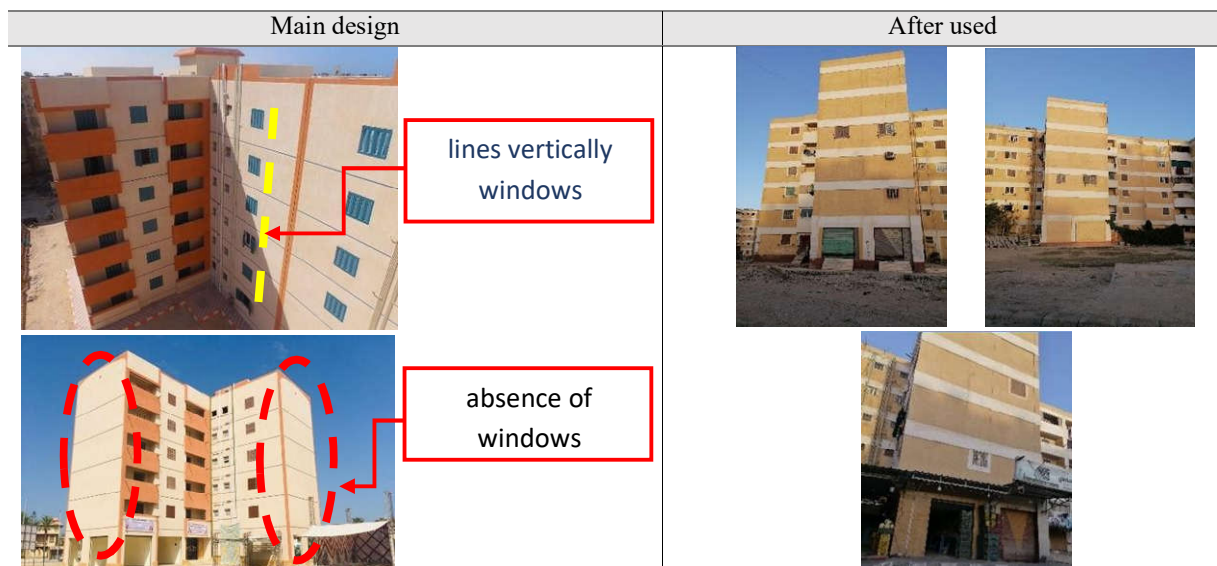


Figure 10. Explain and compare the Opening of the building after use and before use.

In the elevation, the Balconies is protruded from the walls of the building with a small ratio. In some buildings, the balcony has been closed and it has been replaced with windows. As explained in Figure 11.

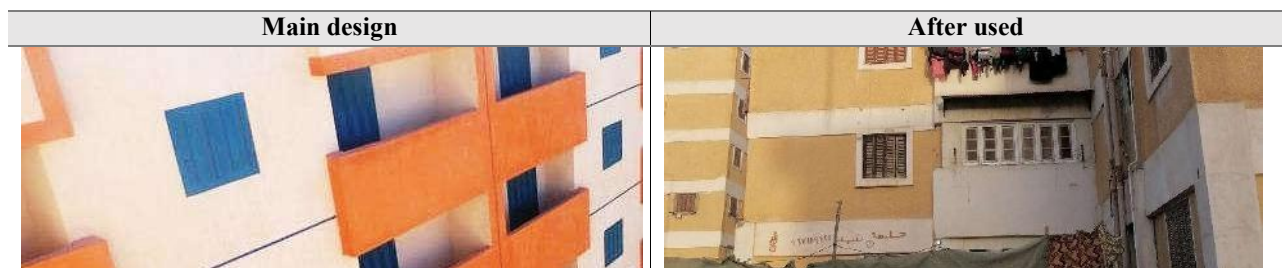


Figure 11. Explain and compare the Projections of the building after use and before use.

The trim had been used in the design around the Balconies. Also, this trim design had painted with different colors. All that had given this building its own identify and its special visual character. The change in the elevation by closing the balcony and replacing it with windows has been erasing the main own identity of this building. Additionally, these windows have different materials and sizes. This made difference in the visual characters of buildings. As explained in Figure 12.



Figure 12. Explain and compare the Trim and Secondary Features at the building after use and before use.

The grafiato had been used in the elevation because it is stable for the environment. The overall character of the building had been seen from a distance because uses two colors in the design elevation. The material for elevation has been damaged because of the absence of interest in maintenance. Some buildings have been restored, but not constructed as the main design for elevations and are not the same color. This restoration made a big difference between buildings. As explained in Figure 13.



Figure 13. Explain and compare the Materials of the building after use and before use.

The buildings have been the alignment of along a street. Also, the shape of the building is (+), this shape helps to increase the spaces for green areas. The places which are designed to be green areas are not used for that. That made the absence of green areas in urban design decrease. As explained in Figure 14.



Figure 14. Explain and compare the setting of the building after use and before use.

3. Result and discussion:

The first phase analyzed the urban planning of this district:

Location:

After analyzing the location of the El Masaid district had been found that this district besides the university increases the load at the services places. Also, the far distance between this area from the city services center made this place need to raise the number of services places.

Road

The road ratio with the total area for the El Masaid district is different in the three phases. Figure15 explains the road ratio in the year 1982 is 3.97%, in the year 2012 is 16.44%, and in the year 2022 is 19.66%. The chart below explains the differences between them.

The road ratio in the year 2022 is higher than in the years 1982 and 2012. The road ratio in the year 2012 is higher than in the year 1982 percentage of 12.47%. Also, the road ratio in the year 2022 is higher than in the year 1982 percentage of 15.69%. According to that, the road ratio increases with time.

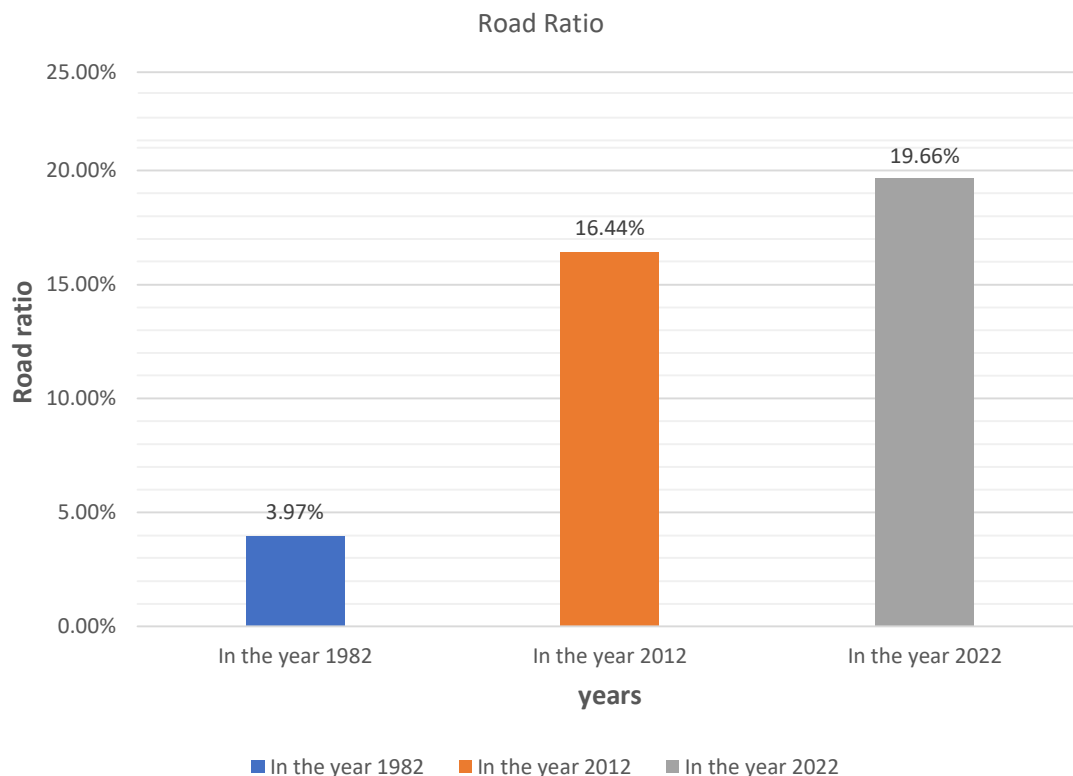


Figure 15: Explain and compare the road ratio between the three phases.

The shape of the residential housing group & privacy

The ratio of privacy has been calculated according to the number of green areas in the landscape and its achieving privacy between buildings. So, it has been classified the privacy to three types excellent, good, and bad. The excellent is the highest level and the bad is the lowest level. In the year 1982, the privacy between buildings is excellent with a

ratio of 47%, good with a ratio of 17%, and bad with a ratio of 29%. Also In the year 2012, the privacy between buildings is good with a ratio of 26.7% and bad with a ratio of 73.03%. Additionally, In the year 2022, the privacy between buildings is good with a ratio of 20% and bad with a ratio of 80%. Figure 16 explains the differences between them.

The privacy for building zone in the year 2022 is worse than in the years 1982 and 2012. The excellent privacy disappears in the years 2012 and 2022. The bad privacy in the year 2012 is higher than in the year 1982 percentage of 44.3%. The bad privacy in the year 2022 is higher than in the year 1982 percentage of 51%. According to that, the privacy between buildings disappears with time.

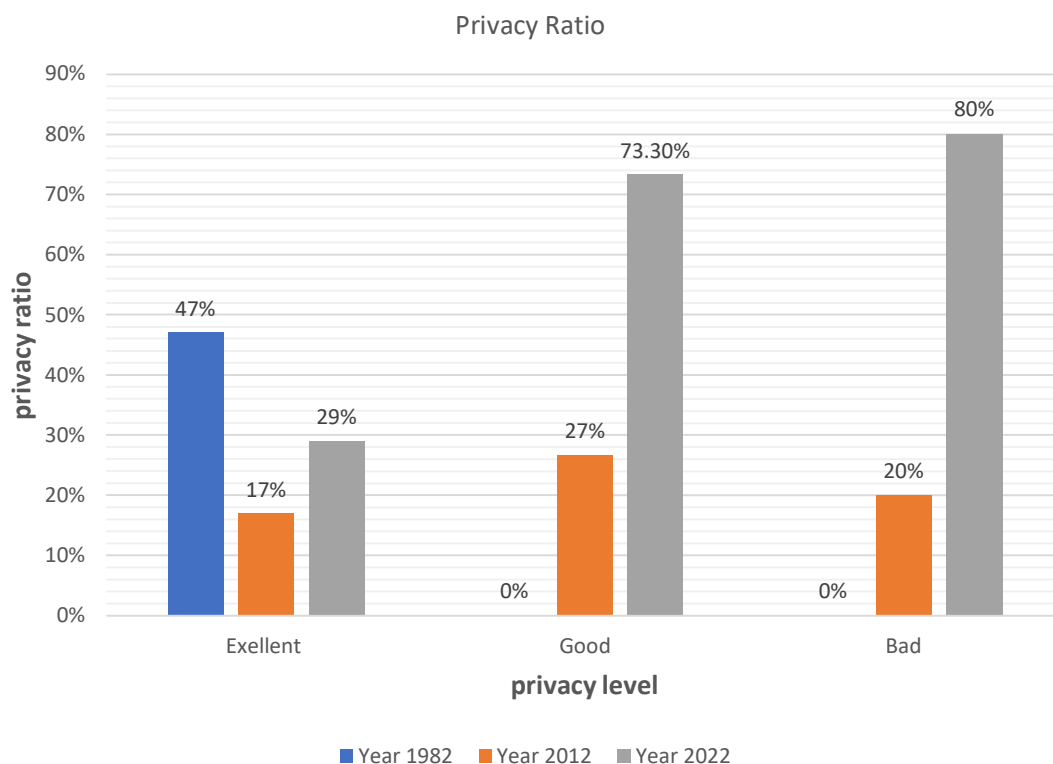


Figure 16: Explain and compare the privacy ratio between the three phases three-level (Excellent – Good – Bad).

Landscape and service

The ratio of the places specified for Landscape and service with the total area for the El Masaid district is different in the three phases. The Landscape and service ratio in the year 1982 is 27.9%, in the year 2012 is 17.9%, and in the year 2022 is 13.3%. Figure 17 explains the differences between them.

The Landscape and service ratio in the year 2012 decreased than in the year 1982 percentage of 10%. Also, The Landscape and service ratio in the year 2022 decreased than in the year 1982 percentage of 14.6%. According to that, The Landscape and service ratio decreases with time. This is the result of an increase in the number of roads and changes in the shape and number of residential housing groups. Emissions of CO₂ had been rising because of intensive urbanization, the rising global population, and improved living standards [5]. So, it is important to increase the green area spaces.

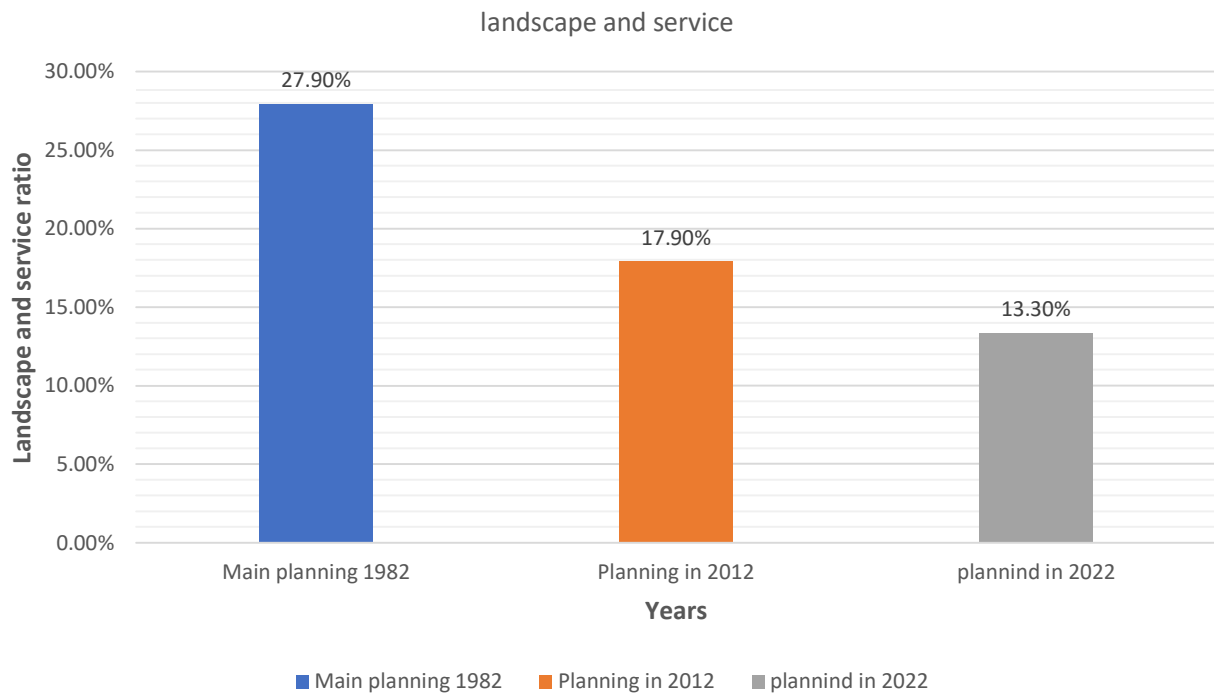


Figure 17: Explain and compare the Landscape and service ratio between the three phases.

The second phase analyses the mutual influence of Architectural Character and Human behaviors and needs.

This phase Studies the Mutual influence between Human behaviors and needs with character Architecture and explains the changes had appeared. So, this phase includes two levels. The first level depends on the character architecture of the building and the effects of human behaviors on it. The second level depends on the effect of urban planning and design building on human needs according to Maslow's hierarchy of needs.

First level: The character Architecture:

Shape: The increasing needs of the population for the service places in this district have been made changed the shape of the building. This change appears in closing the ground floor in some buildings to increase the number of shops to rise the ratio of the services. Rising demand for various types of buildings, such as commercial and residential as a result continues the urban built environment to expand and the world continues to urbanize [6]. so the people had been done some changes in the building to increase commercial places in the building.

Roof and Roof Features: The roof design hasn't Contained shaded areas or Seating areas. Therefore, the population hasn't given the roof any importance and hasn't used it. So, it became a wasted space.

Openings: Decreasing the natural ventilation and lighting in the interior building spaces made people increase the widows to improve natural ventilation and lighting. That has made distortion to the exterior elevation. Because of the difference between these new windows in places, the material of finishing, and the area of every window.

Projections: According to a decrease in the internal spaces for some families and didn't enough for their uses, they have added a balcony to the internal spaces.

Trim and Secondary Features: The design of the area to interior spaces didn't enough for users. wherefore, they have closed the balcony and replaced it with windows. that damage the Visual Aspects of buildings.

Materials: Because the population didn't give importance to maintenance, it has been made damaged the external material and the construction system of the building.

Setting: lack of the ratio of the services compared with the population needs in this place. Additionally, in shortage the number of people who have a car in comparison with the number of parking places. So, they change the function of these paces and changed to service places. To decrease the ratio of services and meet the needs of the population.

Second level: Maslow's hierarchy of needs:

The human needs according to Maslow's hierarchy of needs are physiological needs, safety needs, social needs, esteem needs, and self-actualization.[16] This part has focused on the effect of urban planning on basic need's physiological needs, safety needs, and social needs of the population.

Physiological needs: The most basic human survival needs of Maslow's hierarchy of needs are physiological needs. So, according to the needs of the human to the natural ventilation and lighting inside the building they opened new windows on the external wall because of that effect on the thermal comfort. Therefore, A human's lack of thermal comfort inside the spaces will negatively affect health.

Safety needs: The entrance design hasn't given the population a feeling of safety because it has been opened from all directions. So, some of the population has closed the ground floor of the building. Also, the stairs haven't any natural ventilation or lighting that makes population hadn't felt with safety.

Social needs: The increase of roads decreases the green areas places and the lack of Privacy and Safety in the landscape between buildings had been affected negatively by the social needs of the population. So, it has been founded disappearance of friendships between Neighbor and their children. In addition, the disappearance of social groups contributes at hadn't fulfillment of this need. So, the population hasn't appeared of any importance to the green area's places.

4. Conclusion:

Through study, the comparison between the main design for this district and which construction in the reality has been founded some differences in the location of the building. Also, the visual aspects of the El Masaïd district in the main design had been changed in the reality by the culture, needs, and requirements of the population. Because every society has its own culture and needs, it is important to put some Standards for designing the building and urban places to harmonize with the culture, needs, and requirements of the population in this city.

Safety will be achieved when Specify entrance from one side and providing the building with Warning devices against stealing and monitoring devices. Also, the stairs need to Provide natural ventilation and lighting and add escape stairs. Additionally, customize pedestrian walkways between residential places, Designs roads according to the hierarchy of roads, and Adding Streets with closed ends. Furthermore, it is important to do ongoing maintenance.

Privacy will be increased by decreasing roads between buildings and Rising the number of residential housing groups. Also, Design the area between buildings closed from all sides without the entrance for this area. Additionally, Customize green areas for every Residential group and Non-separation between Housing units.

Increasing the privacy between buildings helps to improve Socializing communication. Also, Rise the ratio of the green area spaces and adding furniture to urban spaces. Additionally, Provide Entertainment areas for residents and

their children and design a commercial street to help with communication. Making sufficiently wide spaces for pedestrians to stop and chat whenever the population needs to that and providing plenty of points of interest to pedestrians increase Socialize communication. Adding a shaded area to the roof can use at making relationships.

The connection with nature improves by increasing the number of green areas places. Also, add more area for the balcony and rise the ratio of the window at the external walls. Additionally, Redesign the roof to make the population uses it in their activity of the day.

Feeling calm when decreasing the number of roads in the district area and Disappearing roads between residential housing groups. design the internal spaces according to the needs of the population and Interest in maintenance help to make the population Feel calm. Also, Used the same color for all buildings.

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