
TOWARDS A MECHANISM FOR CONCLUDING THE MOST RELEVANT URBAN PATTERN FOR THE MIDDLE-INCOME RESIDENTIAL PROJECTS IN EGYPT

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Abstract:

The urban pattern unit is considered the milestone for the design of the various types of housing projects. It is the main unit of measuring and achieving the urban requirements of a certain urban environment. In this paper, the middle-income class residential projects was intentionally selected as the research subject since it represents a key segment of societies in general and of the Egyptian society specifically; as it is a living example of culture, traditions, customs and economic stance of the society, in addition to the increase of the number and the size of the middle-income class residential projects whether it is built by government or privet sector.

This research paper aims at concluding clear criteria for designing a convenient urban pattern unit for the middle-income class residential projects. These criteria should take into consideration people's physical needs, space, landscape, culture, social relationships and economic stance.

The research methodology consists of three parts. The first part is the theoretical review, which covers various urban pattern components to conclude a scheme plan for urban patterns that are used in the second part which is the analytical study. Throughout this part, two international case studies were deeply analyzed. Meanwhile, the third part sheds light on a local field study of two local case studies in Cairo governorate; the first is Ebad el Rahman residential compound, Qattameya and the second is the Egypt aviation company corporate housing project, El-Nozha. Throughout these study parts, the research provides a mechanism of concluding the most relevant urban pattern layouts for the middle-income residential projects.

Keywords:

Urban pattern context, urban pattern components, middle-income class, residential projects

1. Theoretical Review:

1.1. Urban patterns.

1.1.1 Definition of patterns

Patterns can be defined as a plan, a diagram, or a guide for arrangement of repeated or corresponding parts, decorative motifs etc..., and using them to design materials, products, buildings and landscape.

Patterns are also defined as a style, a standard way of moving or acting and a representative sample or a model worth of imitation. [1]

1.1.2 Urban pattern classification due to their nature of formation [1]:

The source of these patterns can be determined by several factors, however there are two key factors related to its design:

- **Nature inspiration:** For example, inspired by tree leaves, water streams, bee hives etc...
- **Human creativity:** Patterns based on geometric shapes or an artistic design with which the designer aims for certain concepts.

1.1.3 Characteristics of patterns:

society of users using this urban



Rhythm



Repetition



Mobility



Scale

Figure (1.1) Characteristics of pattern

Each pattern design has its own characteristics that makes it distinctive, and defines how it deals with buildings and spaces. These characteristics include scale, flexibility, mobility, variety, hierarchy, repetition, rhythm and harmony.

1.1.4 Factors affecting the formation of patterns:

Examples of such factors include:

1. Natural circumstances: causing the pattern to take a certain form, such as around a mountain, or down natural branches of river streams, or along sea coasts.
2. Political factors: implementing particular pattern of city planning for political purposes.
3. Socioeconomic circumstances: urban patterns are affected by the social and economic state of the residents, and the formation of slums and illegal housing types relative to poor economic abilities and urban ignorance is an evident of that.

1.1.5 Urban pattern context:

Urban design consists of two parts; physical components (can be measured, analyzed and designed by urban design tools), such as streets, buildings and the spaces within them. The second part is the

community.

1.1.5.1 Physical urban pattern context:

Urban context determines the physical features and components of the urban environment that it forms; moreover it is the physical language of city and community building. [2]

A-Movement network (streets): Movement network are divided into two types; regular and irregular networks. Each urban pattern needs its specified movement grid that suits the type of motion, the number of meeting points, the visual axis and the location of the densest areas. [3]

B- Urban blocks (Buildings):

The unit of the urban pattern structure is the urban block while the block geometric shape is the main factor of defining the urban form. [4] Recognizing urban pattern features can be achieved through the following: [3]

- ❖ Qualitative analysis of urban fabric: This type of analysis studies the relationship between the building, its surroundings and the intermediate spaces. Types of physical urban tissue are classified by Richard R. as follows: [5]

- Point fabric: where the building is placed inside its land completely surrounded by spaces.
- Linear fabric: the buildings are connected from both sides forming a continuous urban wall.
- Compact fabric: the buildings are connected from two or more sides.
- ❖ Quantitative analysis of urban fabric: The quantitative study of a certain urban fabric depends on the resulting digital readings from analyzing the urban fabric features. The most vital aspects of setting a quantitative study are floor coverage, floor area ratio, housing densities and average floors number.

C- Urban spaces [6]: Urban spaces can be distinguished through different characteristics, whether they are publicity, shape, scale, type or degree of closure.

D-Landscape pattern: Landscape elements are divided into two categories; soft-scape (greenery and water elements), and hardscape (seats, built structures, fences, lighting elements, etc...)

1.1.5.2 Non-Physical Urban pattern context:

It is the result of inserting the social and the economic structure unit through a certain pattern.

This chapter ends by concluding the main

urban pattern components.

1.2. Middle-income class

1.2.1 Definition of the middle-income class:

It is the broad group of people in contemporary society who fall socio-economically between the working class and the upper class. A sizable and healthy middle-class can be viewed as a characteristic of a healthy society. [7]

1.2.2 Components of the middle-income community

Types of middle-class families can be classified according to financial differences:

Upper middle-class: Highly-educated professionals and managers.

Lower middle-class: Semi-professionals and craftsmen with some work autonomy.

1.2.3 General Characteristics of middle-class families: [8]

- Home ownership and at least one private transportation vehicle.
- Achievement of tertiary education (post high school education).
- Holding professional qualifications; including academics, lawyers, engineers, politicians and doctors, regardless of wealth.

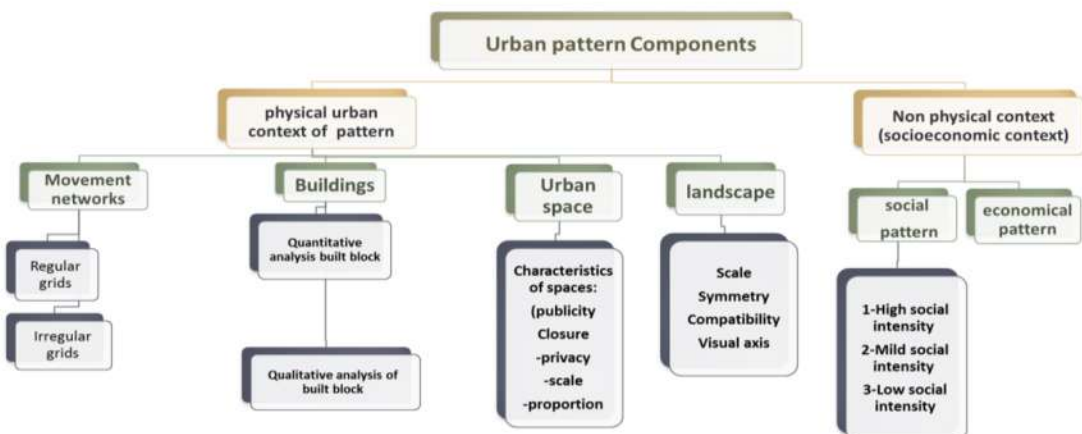


Figure (1.2) Urban pattern components

- Cultural identification and a clear identity.
- The middle-class is the most eager participant in cultural, social and political events therefore they need places to pursue such activities.

1.2.4 The needs of the middle-income families:

- **Basic needs:** middle-class requires quality in the basic life needs, such as owning a private apartment in an adequate location, food, clothing and a clean healthy indoor and outdoor environment.
- **Urban needs:** middle-class requires a good medium quality urban community with enough landscape elements around recreational areas and neighborhood parks for both children and youth.
- **Cultural and social needs** middle-class is characterized by post high school education; therefore there is a need for cultural buildings, libraries and social buildings or spaces for socializing, not to mention their own residential area expresses their cultural backgrounds.

1.2.5 Factors affecting middle-income families

The life of the middle-income family is affected economically by several factors such as income, wealth, consumption and ambition.

1.2.6 Middle-class in Egypt:

▪ The history and evolution of the middle-class in Egypt:

According to the World Bank, the middle-class has expanded in the majority of the Middle Eastern countries, however at the same time it has shrunk in Egypt. The middle-class has witnessed its most flourishing era after the revolution of the 23rd of July, 1952. The free education system and the guaranteed employment system in the public sector helped this class to grow more. The government was controlling all aspects of the economic system and the majority of Egyptians during Nasser's era belonged to the middle class. Following Nasser's era, the Egyptian government has begun to move on to adopt the capitalistic approach, which resulted in the deterioration of the middle-income class, and hence this class has been shrinking. [9]

▪ The size and significance of the middle class in Egypt:

The middle-class is the most sensitive social class to all the problems and crises of Egyptian society. The problems of unemployment and inequality were felt the most by the middle-class due to the fact that people in this class usually enjoy higher levels of education [9]. It is worthy to note that while the middle-class represented about 43% of population by (2001), it currently represents 39% of population (2015).



Figure (1.4) some middle income class residential projects in Egypt

1.3 Urban patterns for the middle-income class:

This chapter discusses the most relevant characteristics of each urban pattern component to the middle-income class.

1.3.1 The physical Urban Components needed for the middle-income class:

The physical analysis of any community is studied through its main urban components as follows:

1.3.1.1 Movement network and street fabric:

The middle-income compounds are enclosed by its buildings within a uniform network grid of vehicles roads; this grid is preferred in this particular class to have easy access from the main roads to public spaces.

Pedestrians have paved sidewalks around the buildings connected within clear paths for walking, observing or even practicing simple social activities. The intersections and number of blocks per square kilometer are both indicators of connectivity and pedestrian accessibility.



Figure (1.5) Middle income spaces

Image source: (WordPress.com)

1.3.1.2 Buildings (Residential blocks):

- **Building heights:** for middle-income class, it is more affordable in the developing countries if the buildings never exceed four or five floors however even if it exceeds this limit they can afford

having elevators installed and maintained in their dwellings if necessary.

- **Blocks Geometric shape:** repetitive blocks with a geometric shape that supports both affordability and aesthetics by providing in between spaces.
- **Block fabric type:** depending on the height of buildings in the design there are two types of block fabric used in middle-income residential blocks, which are:
 - **Point fabric:** used when there is enough land specified for residential use.
 - **Linear fabric:** used when the design integrates building blocks together to form intermediate spaces used for recreation and different social activities.

1.3.1.3 Spaces between buildings:

The research will elaborate on some of the characteristics that specially affect this class, such as:

- **Closure:** In a middle-income compound, it is of high necessity to create open and semi-open spaces to be perceived as transition spaces for social communication and interaction which makes semi-open spaces as important as public space. Meanwhile, closed spaces like the inner courtyards and setbacks provide lighting and oxygenation as well as being highly intimate social spaces.
- **Ratio and scale:** Similar to all residential urban communities, well-designed spaces always considers the relationship between height, lengths and widths of the space from one side and human scale from another side. The height/width ratio also influences the levels of shading.

The space left between buildings has to be either human scale or intimate scale.

- **Connectivity:** Middle-income dwellings have adequate amount of connectivity of their areas to others represented in the directness of links and the density of connections in a transport network.



Figure (1.6) Middle income dwellings (Source: www.dreamstime.com)

1.3.1.4 Landscaping:

The middle-income class is able to afford the construction and maintenance landscaping and the following are the two components of landscape the middle-income needs:

Soft scape: the middle-income community needs sufficient amount of greenery as a breath around their dwellings, including grass areas around each block and grass covered parks.

Hard scape: hardscape is essential to middle-income community, and its elements are as follows:

- Elements for practicing social activities: youth playgrounds, children play zones, pergolas and shadings.
- Elements for pedestrians: bicycle routes, parking lots and sidewalks.
- Elements for site completion and aesthetic purposes: flower boxes, lighting elements, statues and wall paintings, etc...

2. Analytical study:

2.1. Analytical study objectives:

The analytical study's objective is to present the best affordable urban patterns for the middle-income class through analyzing the case studies, in addition to clarifying the effect of each pattern on the urban environment as well as the degree to which each pattern fulfills the middle-income needs.

2.2. Tools of data and information gathering:

Observation is one of the analytical study tools in the information gathering phase. The observation process is divided into: [10]

- **Simple observation:**

mostly used in researches where the researcher neither has enough information nor realizes the type of information he needs for observing this case study.

- **Systematic information:**

where the researcher specifies the type of information he needs to gather by observation of such behaviors.

The study also resolves to other tools of analysis, such as:

- Mapping
- Sketches and diagrams
- Photos

- Outline sketching with the aid of photographs

2.3. Analytical study cases choosing criteria:

The criteria of case study sample choosing are based on finding cases with a group of characteristics which are:

- Sufficiency of both literature and visual data for analysis.
- The presence of a clear urban pattern and most of the analysis elements.
- Choosing a wide variety of patterns across a widely various set of countries.

2.4. Analytical study cases:

2.4.1 Queensbridge Houses

Queensbridge Houses is owned by The New York City Housing Authority and it is the largest social housing project in North America. It is located in Long Island City in Queens and opened in 1939 and still



Figure (2.1) Queensbridge housing



Figure (2.3) Building unit

in use today. It is owned by the New York City Housing Authority, the 3142-unit complex accommodates approximately 6907 people within two separate complexes (North and South Houses). Each complex accommodates about 3450 residents.

The Y-shaped floor plan of the residential towers and their location in a park-like setting demonstrates how much the accommodation of poor city dwellers improved over the course of one and a half centuries.



Figure (2.2) Unit plan showing apartments within one floor



The project consists of -Y- Shaped building units grouped around a wide central court yard space

Figure (2.4) Urban character

- Analyzing urban context:

Table (2.1) Queensbridge urban context (movement network and buildings)




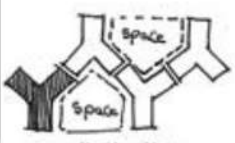
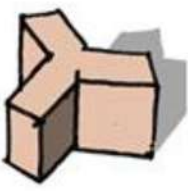











Physical Context																		
1- Movement Network analysis							2-Building Analysis											
 <p> ● Main Roads ● Inner Streets ● Pedestrian Only ● Meeting Points (Nodes) </p>							 <p> ■ Towers & Skyscrapers ■ More than 6 stories ■ 6 stories ■ Less than 6 stories </p>											
							 <p>types of building fabric (detached buildings inside)</p>											
							Buildings heights				Building Pattern				Geometry of the unit			
Elements of reading urban context and urban influences																		
Street Fabric			Street Pattern							Building Fabric			Urban Block					
regular	irregular		Grid	Radial	Contour	Linear	Diagonal	Curvilinear	Organic	Combine	Point Fabric	Linear Fabric	Compact Fabric	Rectangular	Square	Triangle	Topographic	Organic
Square	Rectangular	Branched																
																		

Table (2.2) Queensberg urban context (urban space and non-physical context)

Physical Context		Non Physical Context																								
3- Urban Space Analysis		4- Landscape Analysis																								
 <p>A Inner space A</p> <p>Inner Space Zones</p> <p>Complex's inner court</p>  <p>Social Interaction inside the Complex</p>  <p>Inner building courtyard</p> <p>Unit's Inner Court</p>		 <p>Hardscape Softscape</p>  <p>Softscape Hardscape</p> <p>site shots for landscape</p>		 <p>Low Income Mid Income High Income</p> <p>Economical State</p>  <p>Intense Social Interaction areas Mild Social Interaction areas Areas for quiet observation</p> <p>Social hierarchy of space</p>																						
Elements of reading urban context and urban influences																										
Space Symbol	Urban Space Fetures					Availability	Hard scape			Softscape			social space			Economical State										
	Shape		Closure		Ratio		Scale		Degree of Privacy		Service structures	Lighting Elements	Benches and seats	structural Elemnts <small>Arcs, Fences, etc...</small>	pedestrian Paving	Parkings	Water Elements		Green Elements		Area for calm Vewing	Mild social interaction areas	Intense social interaction areas	high income	mid-income	low income
	Dynamic	Static	Opened	Semi Closed	Closed		Wide	Deep	Corridor	Intimate							Human	Monumental	Public	Semi Public						
A																										

2.4.2 Ruy Ohtake Housing Project 2011.

- **Project description:**

The project is an evidence on the perfect pattern for middle and low-income mass housing projects completed in 2011. The project plans to improve urban living, leisure spaces, educational and health facilities, and provide housing for about 70000 people in 18080 households.

The Residential buildings have eleven 5-storey cylindrical buildings grouped around a central space that holds all social activity. Each building has 18 apartments with access via a central stair. The area of every apartment is 49 m² with 2 bedrooms with a curved external width of 6.50 m. Moreover, there are 2 apartments on the ground floor for the disabled and there is an open recreation area for the residents.



Figure (2.5) The project of Ruy Ohtake



Figure (2.6) Spaces between buildings



Figure (2.7) Apartments from inside