

# Modernization Theory and House Garden Transformation; Erbil City as Case Study

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**Abstract**—Recently, the concept of modernity and its influences on global warming comes to be a common topic in architectural debates. The disappearance of gardens in the contemporary house layouts generated a need for new approaches to create a sustainable network of green areas within residential neighborhoods. The objectives of this paper intend to emphasize on the holistic phenomenon of house garden transformations. The rationale behind selecting cases inside Erbil city, Iraq return to its historical background which passed through rapid transformations due to the political, economic, and cultural changes. This paper aims to identify reason behind disappearance of house gardens in new developments. Moreover, it describes the physical elements of local traditions in different periods. The analytical methodology used in this paper relies on four different periods of the city evolution. It discusses the building garden visual elements in terms of architectural physical factors. The study emphasizes on two types of analyses, the morphology analyses for each period individually, and comparative analyses between different periods. The findings of this paper will indicate the crucial factors that affecting the disappearance of house garden as well as the general positive effects of vegetation in urban contexts.

**Index Terms**—Erbil City, House Garden, Modernity, Morphology, Transformation.

## I. INTRODUCTION

What is a House Garden?

Gardens can be considered as the mirror of house's architectural identity. It's a plane outdoor space that arranges a part for the display, cultivation, and enjoyment of plants and other forms of nature as defined by Turner (2005) A garden is "a piece of ground fenced off from cattle, and appropriated to the use and pleasure of man: it is, or ought to be, cultivated".

The etymology of the word refers to enclosure, as defined by the oxford English dictionary" The term refers to an enclosed area of land, usually adjoining a building." House Garden is an image of life, as explained by (Easton, 2007) that at the core of the garden, further than concepts like landscape, and plantings, lies a state of constant modification .It means that garden formulate a powerful sentimental experience that raises our drive to explore more and more.

Planting of vegetative material within a house (Gardens) is an action of landscaping, which is usually playing an important role in softening the environment (Wilson, 1984). The presence of vegetation within the house layout will enhance the quality of life, a sense of calmness, and reducing the stressful life conditions (Sheets and Manzer, 1991; Herzog and Chernick, 2000; Kuo, Bacaicoa and Sullivan, 1998; Sullivan et al., 2004). Hence, urban residential areas that are rich in gardens will create comfortable places for living.

## II. MODERNIZATION THEORY: REVIEW STAGE

One of the most influence factors on the issue of green architecture and landscape design is the global warming because the climate change has the potential to cause many effects on the landscape. Modernity as an origin of globalization is one of the vital factors in global warming. Recently there has been a rethinking in contemporary social and cultural theory of the concept of modernity; the most impressive source for its manifestation is technology, which is a restless and accelerating process of transformation (Baper et.al, 2010). For most architects technology means the fundamental tools for modernization. On the other hand the continuous technical progress in science and technology feeds as motivators to introduced new dimensions to the social life and a regular change to the traditional cultures. Therefore, technology is a part of civilization and the art of life. It is a broad concept that deals with knowledge of tools and crafts, and how it affects a species' ability to control and adapt to its environment (Rasoul, 2003).

For Habermas modernization theory is an analysis and evaluation of modern forms of social life. It indicates the social, political, cultural and psychological circumstances that

occur from certain historical procedures (Baper and Hassan, 2010). Modernization theory according to Habermas's historical analysis, leads to the liberation of subjects from traditional roles and values. In this regards, Froomkin (2003) argues that the society organization is considered as Habermas's central question of modernity (how society should be organized); it means the justification of social choices in a world of fundamental moral equal opportunity. Habermas's title completely makes two points. First, modernity is a project and second, it's a continual project which have not completed. In order to introduce the important account of House garden modernity as a part of society organization, it is useful to explore in detail morphological analysis of house garden evolution through time.

### III. HOUSE GARDEN TRANSFORMATION IN ERBIL CITY

Throughout its 6,000 years of urban civilization, the Erbil city architectural tradition has been categorized by architectural principles that highlighted the building with nature, Fig. 1. In order to crystallize house garden landscape modernity categories in Erbil city, and for the purpose of data collection, the study will divide the periods of Erbil city evolutions into four categories.

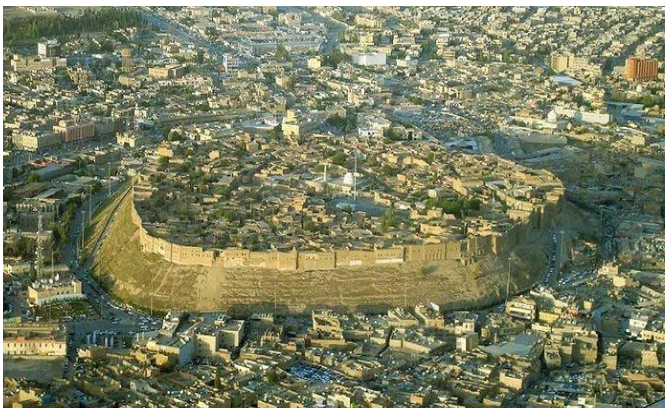


Fig. 1. Erbil Citadel City

#### A. Traditional Period Before 1930 (Pre-Modern Period)

Traditional ancient city of Erbil, (Fig. 2 – first and second stage) is one of the oldest continuously inhabited urban settlements in the world. The distinctive architectural and landscape features of the ancient city can be recognized as a vast complex of buildings and narrow streets enclosed by town walls. In this regards HCECR (2009) explains that the citadel town of Erbil is largely occupied by traditional courtyard houses reached through a maze of narrow alleyways. There are just over 502 dwellings; most of them are courtyard houses of mud walls, short span timer roofs and mud roofing. The average area of the house is up to 140 m<sup>2</sup>. The Citadel courtyard which is usually enclosed formulates the most affectionate and secure of outdoor spaces, for its most related

space between outside environment and the house. Some of the citadel courtyards have a unique tiny effusive fountain, Fig. 3. In spite of its limited area, it gives the feeling of warmth, shelter, and comfort. They provide the most soft environment transformation between the house and outside atmosphere.

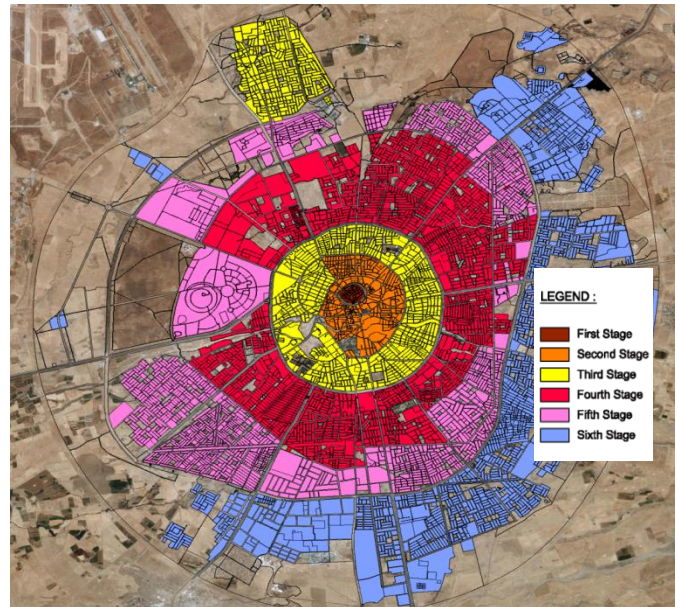


Fig. 2. Historical Development of Erbil City. Source: Erbil City Master Plan Report, 2007.

#### B. Modification Period (Colonial Period) (1930-1980)

In the early twentieth century (Fig. 2- third & fourth stage), especially after Britain occupations a modern city was introduced as an instrument of colonial control. The industrial capitalism and its social and cultural effects provide the basis for notions of the modern. New houses and other buildings started to be built within the lower town, in a new and distinctive style indicating a major departure from the tradition. Hence the concept of modern city means the city of the automobile with the planned streets. In this sense, HCECR (2009) explains Furthermore, these new system provide the possibility for using the large external windows with glass imported from abroad, new paving tiles, doors, and plaster decorations. However, the internal courtyard continued to be used until it was totally discarded in the 1950s and was replaced by a new style of front garden as a mode of western culture.

#### C. Transitional Modernity Period (1981-2003)

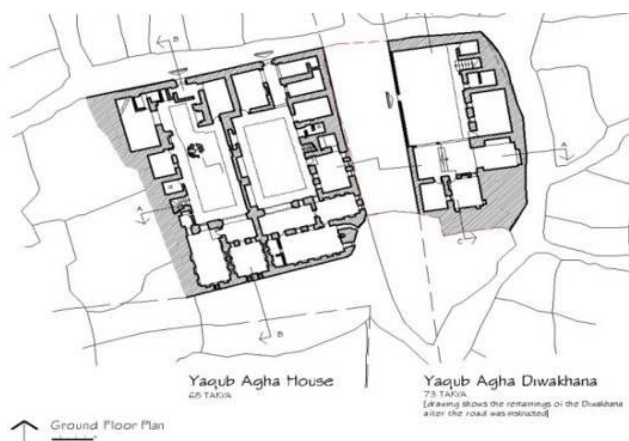
During this period Iraq has been subjected to years of sanctions, war and destruction. Erbil city was influenced by political conflicts in the region. Huge rural migrations towards large cities have been noticed. These rural migrations into urban centers eventually required some kind of urbanized built

environment to accommodate them (Chadirji, 1986). As a result, rural builders who were migrants themselves took the situation into their own hands and imbued the cities with their own concept of urbanization, accordingly large outer spaced gardens, Fig. 4, where produced.

This condition led to an extreme polarization in the production of architecture in Erbil city, Fig. 2, fifth stage. On one hand it reflected the need to construct thousands of housing units for low income inhabitants. The land divisions ranged mostly between 200 and 300 m<sup>2</sup> due to bad economic conditions in this period. The range of the built area was small comparing to the left open space that was used for garden.



(a)



(b)

Fig. 3. (a) A Courtyard in Erbil citadel interior view, and (b) Ground floor plan.

#### D. Advanced Modernity Period (After 2003)

After liberation of Iraq in 2003, architecture in Erbil City has gone through major changes and passed through rapid transformations due to economic developments, (Fig. 2, sixth stage). Consequently, Peace, relative prosperity, and democracy began to grow in the region (Gunter., 2004). This period can be considered as golden era of the city evolution. Many of development projects have been constructed and the urbanization process reached its climax. The rapid growth of the construction and housing sector led to a state of

contradiction in the architectural forms. Strange ideological orientations penetrated into the body of traditions. Most of the housing development projects reflected western concepts and passed over the local traditions. These approaches generate a state of confusion in architectural identity, Fig. 5. The rapid economic developments create new lifestyle which affected the house build area as a result of new functional requirements. As well as the concept of subdivision of a plot of land was the main reason of decreasing the garden area.



Fig. 4. Large gardens in the transitional period (1981-2003).



Fig. 5. Houses without garden after 2003.

#### IV. RESEARCH METHODOLOGY

Visual morphology analysis aims to understand the spatial structure and character of house garden by analysis of physical structures at different scales. The analysis will focus on how the physical form of house garden changes over time. Accordingly, comprehensive checklist factors have been designed to establish an appropriate model for understanding. For the purpose of the study, the Morphology analysis will investigate the most important parameters (dimensions), then assigning each parameter by a range of relevant values.

The methods used for data collection contained a visual characteristics analysis survey using the (morphology checklist survey forms). Furthermore, the surveys enhanced by a photographic study to record and document each housing Garden. The documentation procedure includes house garden

details such as garden type, Geometry, Garden Permeability, materials, etc. The essential reason in conducting this survey aims to construct a mixed matrix form to illustrate the different levels of similarity and diversity between house gardens in one hand as well as to determine the significance of elements and features, whether viewed separately or collectively in the other hand.

For the purpose of this study, samples of ninety six house gardens were selected (an average of twenty four samples in each period). Sample selection based on house garden's importance which have been constructed during the specified period and its familiarity, in addition to its semantic richness and diversity.

V. FINDINGS

The Morphology analysis produced the following results:-

A. Type of Gardens

1. Pre-modern period: Results show (Table I) that 83.4% of the cases have (courtyard open spaces) while 16.6% of cases have no gardens or open spaces at all. Moreover, there are no indications for other types of gardens.
2. Modernity Period (1930-1980): front garden is the most popular type in this period as an average of 87.5% while 8.3% of cases are back yard gardens.
3. Transitional Modernity Period (1980-2003): front garden is still dominant in this period as a rate of 79.1% of cases, while anew style of courtyards gardens appeared as an average of 12.5%.
4. Advanced Modernity Period (After 2003): results show that front garden started to disappear as an average of 20.8% , while a strong trend of houses with no gardens appeared as an average of 62.5% of the cases.

TABLE I

TYPES OF GARDENS IN DIFFERENT PERIODS OF ERBIL CITY EVOLUTION

Periods Of Erbil City Evolutions	Sample size(n)	Roof Garden	Front Garden	Back yard Garden	Courtyard Garden	Patio Garden	Window boxes G.	No Garden
Traditional (before 1930)	24				20			4
Modernity (1930-1980)	24		21	2		1		
Transitional 1980-2003)	24		19	1	3			1
Advanced (after 2003)	24	1	5		1	1	1	15
Total	96	1	45	3	24	2	1	20

B. Geometry of Gardens

1. Pre-modern period: Results show that non- Regular Geometrical shape is the most dominant shape with an average of 70.8%, with a low average of 12.5% for the regular Geometrical shape and there are no indications for other geometric shapes in this period (Table II).

2. Modernity Period (1930-1980):A new style of regular geometric shape of gardens started to appear strongly with an average of 91.6%,while the non-regular geometric shape rate minimized with an average of 8.4%.
3. Transitional Modernity Period (1980-2003): the style of regular geometric shape is still dominant in this period with an average of 87.5%, while a new type of curvature shape gardens appeared with an average of 8.3%.
4. Advanced Modernity Period (After 2003):Due to the disappearance of house gardens in this period, the rate of 25% of remaining gardens are of geometric shape, and 12.5% of curvature shape.

TABLE II

TYPES OF GEOMETRY OF GARDENS IN DIFFERENT PERIODS

Periods Of Erbil City Evolutions	Sample size(n)	Regular Geometrical shape	Non-regular Geometrical shape	Curvature shape	Flexure shape	Mixed (geometry and non-geometry)	No Garden
Traditional (before 1930)	24	17	3				4
Modernity (1930-1980)	24	22	2				0
Transitional (1980-2003)	24	21		2			1
Advanced (after 2003)	24	6		3			15
Total	96	66	5	5			20

C. Garden Permeability with Street

Results in Table III show that house garden permeability with street in pre-modern period is full solidity without any transparency to external spaces as an average rate of 100%. While in second period a number of cases appeared to be semi solid as a rate of 25%, in third Period the concept of full solidity dominate all cases. Finally in Fourth Period a new approach appeared to add transparency to house garden as an average of 8.4%.

TABLE III

GARDEN PERMEABILITY WITH STREET IN DIFFERENT PERIODS

Periods Of Erbil City Evolutions	Sample size(n)	Full solidity	Semi solidity	Neutral	Semi-transparency	Full transparency	No Garden
Traditional (Before 1930)	24	20					4
Modernity (1930-1980)	24	18	6				0
Transitional 1980-2003)	24	23					1
Advanced P. (After 2003)	24	6		1		2	15
Total	96	67	6	1	0	2	20

D. Garden Materials

Hard materials is the dominant concept of house garden in first period as an average of 70.8% while 12.5% of garden

material are mixed between hard and soft materials. In the second period Soft materials dominates 79.1 % of cases and 20% of cases are mixed between hard and soft materials. In third Period, soft materials continued to be the dominant features of house garden as an average of 91.6%. Finally, in the fourth period, the concept of hard material returns to the manifestation as a rate of 8.3% of total cases and 25% of cases is still focusing on soft materials in house gardens, Table IV.

TABLE IV  
GARDEN MATERIALS IN DIFFERENT PERIODS

Periods Of Erbil City Evolutions	Sample size(n)	Soft materials	Hard materials	Mixing hard and soft materials	No Garden
Traditional (Before 1930)	24		17	3	4
Modernity (1930-1980)	24	19	4	1	
Transitional 1980-2003)	24	22		1	1
Advanced P. (After 2003)	24	6	3		15
Total	96	47	24	5	20

E. Ratio of Garden Area to Plot Area

The ratios of house garden to the plot area of houses, Table V, are as follow:

TABLE V  
RATIO OF HOUSE GARDEN IN DIFFERENT PERIODS

Periods Of Erbil City Evolutions	Sample size(n)	Less than 10%	(10-25)%	(25-50)%	More than 50%
Traditional (Before 1930)	24	3	16	5	
Modernity (1930-1980)	24	2	6	15	1
Transitional 1980-2003)	24		7	17	
Advanced P. (After 2003)	24	18	4	2	
Total	96	23	33	39	1

Garden Location within the Plot of Land

Results in Table VI shows that 83.3% of cases in the first period are located in the center of the plot (courtyard) .while in the second period 70.8% of cases are located in the front, 16.7% in the front and sides and only 8.3% are located at the back of the plot. The idea of front garden is strongly adapted in the third period as a rate of 87.5%. In the final stage all available garden are located at the front of house inclusively.

Garden Size

Gardens in the first period are medium and large in size in

relation to result findings that 33.3% of cases are medium and 50% of cases are large (more than 20 m<sup>2</sup>) in size. In the second and third periods results show that garden size are large in size as an average of 75%, and 83.4% respectively. Whereas in the final stage the garden size return to be small in size as an average of 37.5% or disappeared totally as a rate of 62.5% of total cases, Table VII.

TABLE VI  
TYPES OF GARDENS IN DIFFERENT PERIODS

Periods Of Erbil City Evolutions	Sample size(n)	Front Garden	Side Garden	Back Garden	All around	Centre (court yard)	Front and back	Front and side	No Garden
Traditional (Before 1930)	24					20			4
Modernity (1930-1980)	24	17		2		1		4	
Transitional (1980-2003)	24	21						2	1
Advanced P. (After 2003)	24	9							15
Total	96	47		2		21		6	20

TABLE VII  
SIZE OF GARDENS IN DIFFERENT PERIODS

Periods Of Erbil City Evolutions	Sample size(n)	Small less ≤ 10m <sup>2</sup>	Medium (10-20)m <sup>2</sup>	Large ≥20m <sup>2</sup>	No Garden
Traditional (Before 1930)	24		8	12	4
Modernity (1930-1980)	24	2	4	18	
Transitional 1980-2003)	24		3	20	1
Advanced P. (After 2003)	24	9	0	0	15
Total	96	11	15	50	20

Garden Accessibility from House

In the first period, Results in Table VIII shows that the accessibility to all courtyard gardens is direct access as a rate of 70.8% and access via arcades is 8.3%.while in the second period the direct accessibility reduced to 62.5% at the same time accessibility via in between spaces and entrance lobby decreased to 20.8% and 16.6% respectively.

In the third period, 83.3% of cases indicate direct accessibility to house gardens. Finally in the fourth period results show that only 16.7% of cases are in a condition of direct accessibility with manifestation of new types of accessibilities from patio.

TABLE VIII  
GARDEN ACCESSIBILITY IN DIFFERENT PERIODS

Periods Of Erbil City Evolutions	Sample size(n)	Direct access to garden	Access via in-between spaces	Access via arcades	Access via patio	Access via entrance lobby	No Garden
Traditional (Before 1930)	24	17	1	2			4
Modernity (1930-1980)	24	15	5			4	
Transitional (1980-2003)	24	20	1			2	1
Advanced P. (After 2003)	24	4	1		3	1	5
Total	96	56	8	2	3	7	20

## VI. CONCLUSIONS

The morphological analysis of house garden in different periods of Erbil city evolution produced following facts:

- House garden is a project to create a comprehensive and sustainable network of green areas .it aims to connect house units within urban context in a manner of environmental behavior.
- House garden is considered to be one of the most important kinds of vegetation for house enclosure. It aims to reduce energy consumption, by bringing the landscape into the house for shade, air quality and energy saving, as well as it intends to enrich bio diversity environments to improve the psychological and physical health of inhabitants. This conclusion to be or become identical with (Sullivan, Kuo, and DePooter 2004) concepts that an increase in trees and grass is positively correlated with the amount and character of social interactions in urban spaces.
- The regularity of house garden in a geometric shape translated the mode of modernity in comparison with non-geometric shape of traditional period .it's the influence of modernity forces on local tradition.
- Courtyards are the common type of gardens in traditional period. It provides space, light and a quantity of greenery for social and private activities. While in other periods house garden emphasizes on green area and tress for psychological aspects.
- In spite of the bad impression of modernity on local traditions, the concept of green area within the plot of land was one of the benefits of colonial period. This concept translated to house front garden and created the environmental softening for urban context.
- The garden permeability with street in most cases is considered as (Full solidity) .this idea is a translation of Islamic approach toward inside looking and can be considered as a mode of privacy.
- The size of house garden works as an in-between space to separate the house from the street. The new division of house lands according to municipality regulation as well as the new functional requirements in recent period is

main factors in reducing house gardens size which affected the privacy of inhabitants.

- The simplicity of garden material and urban compact pattern arrangements indicates the simplicity of people and the role of Islamic religion in dissemination of the idea of unity, humility and simplicity among the Neighborhoods.
- The new functional requirements of modern life style (Social factors) and owning more than one vehicle by family members (Economical factors) affected the garden size (to be small or disappeared totally) .Moreover, it reduced the ratio of garden area (open spaces) to house build area. These transformations have a direct impact on global warming and energy conservation.
- Direct access to house garden is a translation of Kurdish society toward nature. This issue can be considered as enhancement towards green architecture.
- The second and third periods of Erbil City Evolution indicate that most of house gardens are front gardens in a grid iron pattern of row houses. The juxtapositions of these gardens will create a green belt and enhance the concept of green infrastructure within urban context.

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