

DEFINING THE ARCHITECTURAL AND INTERIOR IDENTITY:

A CASE STUDY ON GHADAMES SETTLEMENT

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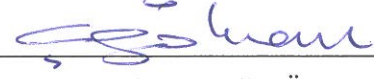
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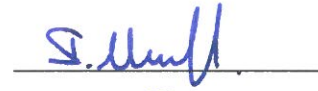


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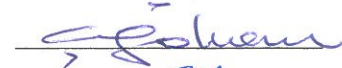
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ABSTRACT

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This research investigates the urban identity and its transformation in the city of Ghadames, Libya. The thesis starts by studying the identity dimensions, which are the physical identity, environmental identity, socio-cultural identity and economic identity. Moreover, the literature provides many elements under each dimension, which are elaborated through the course of this thesis. Furthermore, the case study of Ghadames investigates the identity and its transformation from a theoretical view by applying each of the identity dimensions and its subsidiary elements on the old and new developments of the city. Nonetheless, a gap is identified in the literature about Ghadames's identity especially with regard to the socio-cultural and environmental dimensions, which the research addressed through a field assessment methodology, i.e. inhabitant's questionnaire. The results of the study show that the physical elements were not properly satisfied during the development of the new city in order to maintain the city overall identity. Moreover, out of twenty-one identity elements, it is found that only two elements are compliant with the city's identity, seven elements were incompliant and the rest of the elements are diminishing due to lack of identity empowerment. At the end of the study, recommendations to preserve the identity of Ghadames are summarized.

Keywords: Ghadames, Libya, Urban identity, Identity transformation, Users, Urban interiors

ÖZ

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Bu araştırma, Libya'nın Ghadames kentinde kent kimliğini ve dönüşümünü incelemektedir. Tez, fiziksel kimlik, çevresel kimlik, sosyo-kültürel kimlik ve ekonomik kimliğin boyutlarını inceleyerek başlıyor. Ayrıca, literatür, her boyutun altında, bu tezin ilerleyen kısımları boyunca detaylandırılan birçok öge sunmaktadır. Literatürde elde edilen kimlikler çerçevesinde Ghadames'in vaka çalışması, kentin eski ve yeni gelişmelerine kimlik boyutlarının ve alt unsurlarının her biri uygulanarak kimliği ve teorik bir görünümünden dönüşümünü araştırıyor. Yine de, literatürdeGhadames'in kimliğiyle ilgili bir boşluk tespit edilmiş ve bu eksiklik bir alan ölçme metodolojisi, yani sakinlerin anketi yoluyla ele aldığı sosyo-kültürel ve çevresel boyutlar açısından araştırılmıştır. Çalışmanın sonuçları, kentin genel kimliğini korumak için yeni şehrin gelişimi boyunca fiziksel unsurların uygun bir şekilde tatmin edilmediğini göstermektedir. Dahası, yirmi bir kimlik unsurunun dışında sadece iki unsurun kentin kimliğine uyumlu olduğu, yedi unsurun uyumsuz olduğu ve öteki unsurların kimlik güçlenmesinden yoksun olarak azaldığı tespit edildi. Çalışmanın sonunda Ghadames'in kimliğini koruyacak öneriler özet olarak sunulmuştur.

Anahtar Kelimeler: Ghadames, Libya, Kentsel kimlik, Kimlikdönüşümü, Kullanıcılar, Kent iç mekanları

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To my country

To my family

To my daughters

To my friends

who without their support and patience this thesis would have not been
completed.



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CHAPTER 1

INTRODUCTION

In a globalized world, where the identity of a city or group of people is becoming more seamless, many aspects can be told about a culture or a city from its architecture and building style, the old cities used to have its own unique parameters that can truly distinguish them from each other. Even cities that in our present time are lying in the same country always differ depending on several input factors including society, environment and culture (Assmann, 2008). However, new cities are facing a serious challenge keeping up with same tone of their old sisters as the input factors that affect the architectural design of its several aspects have changed because of many elements that changed the nature of the same cities socially, environmentally and culturally. Experts in the field refer to globalization as one of the challenging factors that affected the continuity of the architectural identity between old and new cities which is also referred to as “homogenizing force” not only in the architectural aspect, but also economically, politically and culturally (Wennberg, 2015).

While the old cities in the Middle East region have always had the clear influence of their inhabitants, who tried for many years to adopt to the environmental elements of their own cities, many other elements are apparent in their choice of shapes, design principles, materials, context, colors, and functional spaces. Furthermore, the identity of a city can be influenced by the way its inhabitants feel about it and the degree of belonging that they have towards their hometown (Heidari & Mirzaii, 2013). Figure 1.1 illustrates the level of belonging that a person can have towards his city's identity.

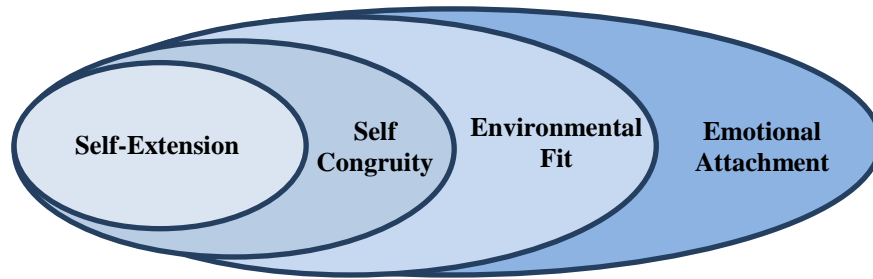


Figure 1.1 Different levels of place identity(Heidari & Mirzaii, 2013, p. 267)

Moreover, the Middle East in general and Libya in particular is one of the most areas that suffered negligence for its architectural identity for several decades due to the political instability and lack of awareness imposed by the general influencing situation (Nooraddin, 2012). However, the concept of identity can change meaning depending on the way the inhabitants of a place are engaged in it, thus the time of building the new city can also affect the way the place's identity is perceived (Wennberg, 2015). This research will study the concept of identity from all its aspects that can affiliate its several elements. Furthermore, a study case is selected to highlight the similarities and difference in the old and new architectural identities of the Ghadames settlement in addition to the challenges that are facing the city synchronizing with its built environment.

1.1 Aims and Objectives of the Study

As it became a challenging concept affected by an increased number of factors, architectural identity is an important aspect to study in any continuing civilization. Therefore, the main goal of this study is to study the architectural identity concept and apply the outcomes to understand this aspect in Ghadames old and new cities in order to evaluate the identity adoption to the inhabitant's needs and requirements. Furthermore, the main objectives of this study are as the following:

- Identify the architectural identity concept in its ideal context.
- Explore the effect of architectural identity on new cities built beside their old cities.

- Study the challenges, issues and adoption methods that were experienced and used in other study cases in order to conserve the identity of the place.
- Study the architectural identity of the old and new cities of Ghadamessettlement.
- Examine Ghadames architectural identity with the perception of its inhabitants.
- Derive recommendation, conclusions and ways to conserve the identity of the city based on the study results.

1.2 Research Question

The main question of the research is how did the identity transform in the settlement of Ghadames in its physical, environmental and socio-cultural dimensions between the old and new parts of the city?

The study will start by investigating the concept of identity in cities and its several elements. Moreover, previous studies will be researched to understand the concept from a practical view and the way it was applied on cities around the world.

Furthermore, an analytical study is performed on Ghadames to understand the way its identity is formed through a read in the literature related to the city. Nevertheless, the new city of Ghadames is evaluated to understand the identity elements that were taken into consideration while constructing its different structures. The study will question the identity in Ghadames through an analysis of its urban morphology and structure, and by assessing the resident's perception of their city's original and new identity. Subsequently, the study provides set of recommendations for measures to reinforce the coherence between the old and new parts of Ghadames.

1.3 Scope and Structure of the Study

The study will focus on identifying the original and current identity of the city of Ghadames and the transformation in the physical, environmental and cultural identities between the old and new parts. Therefore, in the five chapters that are included in this thesis, the research will start by reading the literature to

understand the concept of identity. Several case studies are selected in order to form a clear idea about the identity transformation between the developed parts of the cities around the world. Moreover, another study is selected in order to examine specific aspects of the identity and built environment comfort, which is a previous study made on thermal and privacy in the traditional Arab house in the Middle East. The definition of the identity from several sources and specialists is included and compared to form a general understanding. Subsequently, the identity of a city is studied from perspectives of the city as a whole, the buildings that form the different parts of the city and the lifestyle of the city inhabitants.

Furthermore, an analytical approach to the case study by understanding Ghadames's identity via applying the theoretical perspectives that are explored in the theoretical part of the study. This includes an elaboration on the transformation and development of the city's parts and highlight the several aspects that within or out of the identity context. Thereafter, an assessment of the city through a field survey targeting the city and its residents is carried out, which will start by explaining the methodology of the practical part of the study and the design of the survey and questionnaire. Therefore, this part will contain a photographic survey and field observation in addition to viewing the questionnaire's raw results. Subsequently, this part will contain an evaluation of the built environment by the residents of the city and an analysis to the findings of the questionnaire in order to involve the people which are a major part in defining the identity of any city. The analysis will contain Ghadames's people opinions about several aspects in the old and new city including the safety, privacy, courtyard, comfort, public areas and social lifestyle, using a grounded theory.

Finally, an understanding of the identity concept is derived from the study's methodology in its several aspects. Likewise, a set of recommendations and conclusions that will lead the study to closing point with the lessons learned and findings of the research.

1.4 Methodology

Since the study aims mainly to study the urban identity of Ghadames settlement and the transformation between the old and new cities, in its several qualities and elements, it is necessary to adopt a qualitative methodology in order to perform a credible research and produce reliable results. Therefore, the approach to this study is performed through three methods:

1. **Theoretical Method:** this method mainly depended on the theoretical understanding of the architectural identity concept in addition to performing a literature review of previously conducted study cases in order to understand all the elements and factors affecting the subject and the results that were reached. This part is completed through the second chapter of this thesis.
2. **Analytical Method:** the study analyzes the urban identity of Ghadames and its transformation between the two main parts of the city, which are the new and old cities. The analysis focuses on the transformation of the identity in regards to the physical, environmental and socio-cultural elements. Moreover, the development of the built environment was analyzed and the gaps were identified.

Furthermore, as part of the case study, a field assessment is performed of the transformation in identity in Ghadames, which is further explained in the fourth chapter of this thesis.

CHAPTER 2

THEORETICAL UNDERSTANDING OF IDENTITY

The identity of any place is directly connected to the identity of its inhabitants while the main essence of identity are determined by the person's memory and other affecting factors such as the person's feeling and attitude (Wennberg, 2015). This theory was presented in the third decade of the 20th century by Maurice Halbwachs who linked the memory of a person to the social context of the inhabitants of a place. Therefore, the architectural identity is not about the memory of a certain person rather than the collective memory of a group of people who establish certain social communication framework that forms their identity. Furthermore, the culture that is established based on that social communication framework and the associated participation and diversity translate subsequently into the physical identity features (Czumalo, 2012). Based on Halbwachs theory of collective memory, Table 1 below explains the position of the collective memory amongst the social and cultural levels (Assmann, 2008).

Table 1: Basic collective memory positioning(Assmann, 2008, p. 109)

Level	Time	Identity	Memory
Inner	Individual time	Inner self	Individual memory
Social	Social time	Social collectiveness	Communicative memory
Cultural	Historical and cultural time	Cultural identity	Cultural memory

In other words, the individual memory that is spanning within the individual time forms each person's identity. The collective memory of a group of people which

is formed through the communication of the group's individual identities forms the communicative social memory. Over the time span, the communicative memory forms the cultural memory which in part of it translates to the architectural identity of the place where these individuals and their social and cultural contexts are located.

2.1 The Definition of Identity

An identity in architecture is a congenital context illustrated by the factors within the place socially and culturally that reflects on the physical elements of the buildings and the city as a whole. The collective memory of the place's inhabitants fixes a vision of the elements that forms the architecture in a given place including its evolution and adaptations (Fazeli, Babaei, & Ghasemzadeh, 2012). Moreover, the identity of the city creates back the identity and nationality of the place's inhabitants which turns them into a culture more than settlers.

Studying the design of any city cannot be achieved without understanding its specific identity which has social and cultural dimensions. Therefore, there is a conflict in our current time between preserving the traditional identity and the modern identity that is evolved through globalized context. Tavakoli (2010) defines the identity through its indicators which can be summarized as the following:

1. The difference between a certain identity and other identities, and the similarity of the identity with itself.
2. The continuity of the original identity and its senses while evolving with the current era at the same time.
3. Preserving the relation between the various components of the identity in a way that keeps the unity between them as well as their diversity.

2.1.1 Aspect of Identity

Moreover, the architectural identity of a city can disclose the identity of its inhabitants in many senses including their religion, surrounding environment and racial belonging. In that sense, the architectural identity becomes the reflection of

its creators (Fazeli et al., 2012). Furthermore, there are many components that affect the physical identity of a city and reflects on it. However, the weight of influence of each component may vary from a city to another depending on the importance of a specific component to a civilization socially and culturally. Figure 2.1 below illustrates the several components that reflects on the physical identity of a city (Tavakoli, 2010).

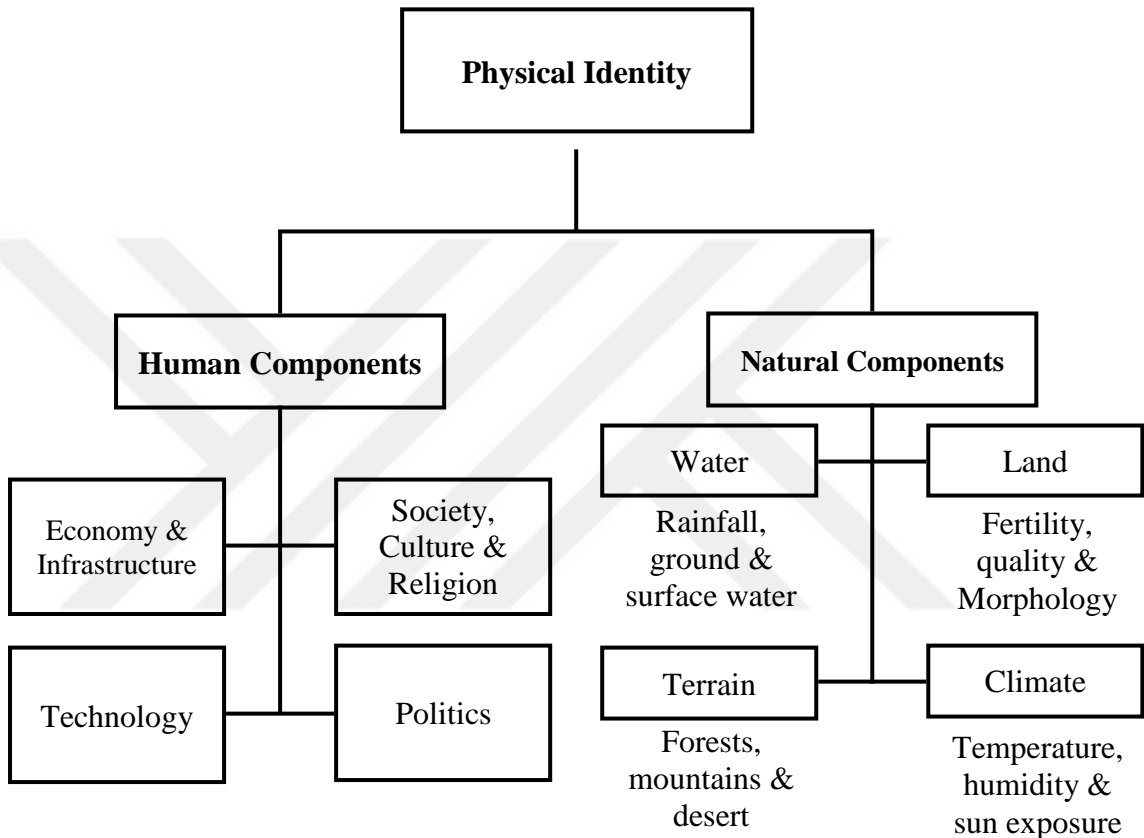


Figure 2.1: Components that affect the physical identity. Adopted from Tavakoli(2010)

Furthermore, the identity of a city has several dimensions that can be measured through the physical elements that forms it. Nonetheless, those dimensions are the ones distinguishing each city from another one where preserving the identity comes from the ability of its creators and their proceeding generations to maintain the same influence on the physical elements of their city (Tavakoli, 2010). In order to facilitate an understanding of the dimensions that reflects the city

identity, Figure 2.2 shows the different dimensions that result from the identity of the city and the sub-dimensions that forms each one of them.

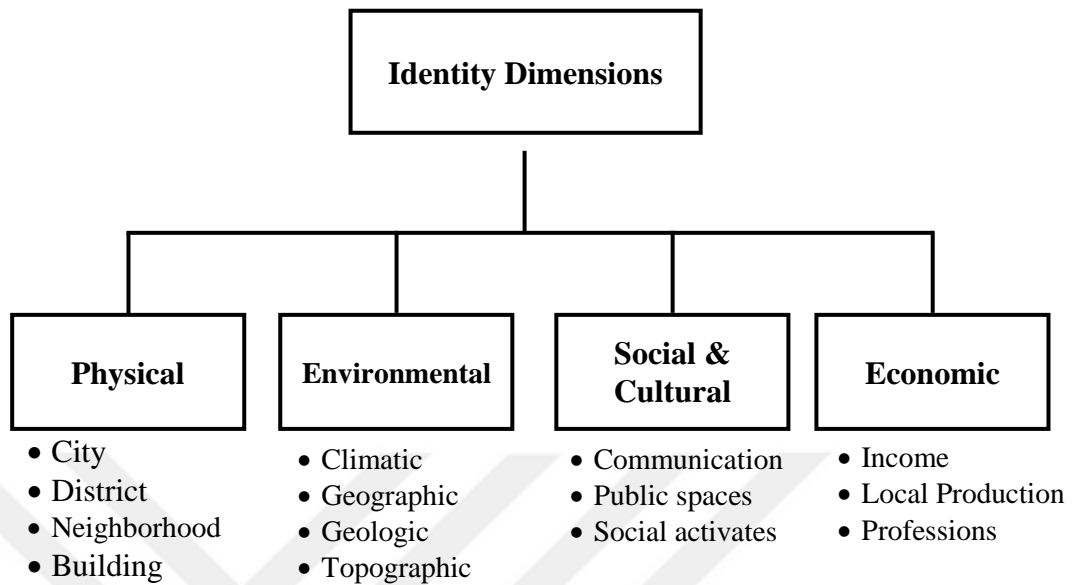


Figure 2.2: The dimensions resulting from the identity. Adopted from Tavakoli(2010)

In this study, the focus will be drawn towards studying the identity of the city in its physical, environmental, socio-cultural dimensions.

2.1.1.1 Physical Aspects of Identity

The city is identified as a phenomenon which is lies in a geographic location and represented by physical components in spatial space with limits. This makes the city a product of the people’s culture, history, language, religion and identity (Comic & Vicic, 2013). In order to understand the identity of a city, it needs to be broken down into its components that are the buildings, neighborhoods, districts and then the city as a whole. Moreover, the physical identity in a city is measured by the ability of the people to recognize and distinguish it from other cities around the world (Pazhuhan, Zayyari, Ghasemzadeh, & Qurbani, 2015). According to Pazhuhan et al. (2015), there are eight factors that indicate the identity in the physical aspects of a city:

1. Homogeneity between all the identity elements.

2. The structure of the different components of the identity, which creates a spatial identity.
3. The contrast of the identity elements, while keeping the overall unity between them.
4. The link between the different identity elements, which make them expressed as one unit.
5. Proportion suitability between the building sizes with each other and with the human size.
6. Seamlessness in development between the time periods.
7. Privacy definition and the way the city elements take this factor into considerations.
8. Uniqueness of structures, which makes a city different from others.

These factors describe the criteria that should be considered when analyzing and understanding the physical aspects of identity of a city. Therefore, in the analysis of Ghadames of this study, each of these aspects are analyzed for the old and the new cities, and then combined together in order to understand the gaps and shared characters of Ghadames.

2.1.1.2 Environmental and Socio-Cultural Aspects of Identity

The environmental and socio-cultural aspects of the city identity are interconnected as both elements are in constant effect of each other. Moreover, Butterworth (2000) elaborates that the environmental identity of a city is what forms the social and cultural behaviors of its inhabitants, which is related to many factors including:

1. Balance between curiosity and confidence: the city's environment should keep its residents interested in pursuing life in the place, while reserving their confidence in life and future.
2. Community sensation: this is illustrated by the extent of feeling, where each individual in the city belongs to the bigger community and is aware of the needs and challenges that face the group. This element is found to

have direct and indirect impacts on the unity of the physical aspects of the identity.

3. Physical events: the more these events promote a more collective participation between the community members, the more the identity is strengthened in its environmental and socio-cultural aspects.
4. Security: this is related to the physical environment of the place and down to its neighborhood formation, which empowers the safety and the residents' sense of it in their living experience. The security sensation in a city is strengthened as the social and cultural ties between the residents are reinforced with more trust and social interactions.
5. Privacy empowerment: as it is one of the natural and personal needs of humans, privacy need to be supported by the way the living space and neighborhood are designed. Failing to achieve the satisfactory sense of privacy may lead to weakened social ties within the community.
6. Involvement and sense of self-importance: this factor is identified as an essential need to psychologically healthy community, which cherish the sense of belonging to the identity. The individuals of the community need constant indications that they are important in their environment and they have influence on the lifestyle and socio-cultural activities (Butterworth, 2000).

The ability of the city to achieve a sense of belonging and calmness for its inhabitants indicates the extent of the identity in it. Therefore, when a city satisfies the social needs, enables its people to recognize themselves through it, and provides the feeling of security and belonging for them, the essence of its identity are illustrated (Fazeli et al., 2012). Furthermore, there are three sub-aspects to be studied in studying the environmental and socio-cultural identity of any place, which are:

1. The geographic limits of the place, which identifies the nature of the community and the way the inhabitants form their physical elements to suite the environment.

2. The social solidity between the community members, which determines the extent of security, privacy and unity sensation.
3. The satisfaction of the community collectively and individually, which determines the confidence, involvement and sense of self-importance of the society in their identity (Uzzell, Pol, & Badenes, 2002).

The relationship between the several aspects of the identity is strong that requires taking all factors and elements into account when studying the identity formation and transformation in any place. Thus, in studying the environmental and socio-cultural aspects of the identity in Ghadames, factors are connected and checked consistency with the physical aspects of the settlement's identity.

2.2 Related Studies in the World

In this study, literature review is performed on three studies that cover identity from a global, transformational and environmental perspectives in order to serve two main purposes:

1. Understand the methodology of the literature in studying the identity in cities around the world.
2. Form a solid idea about the possible findings of this thesis and drawing a map for the study's structure.

Therefore, the studies that are chosen for this thesis are represented in Table 2 that forms a general idea about each study.

Table 2: Similar studies used to develop analysis method for Ghadames (Compiled by the Researcher)

Study	A (Auckland)	B (Bodrum)	C (Middle East)
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Table 2: Similar studies used to develop analysis method for Ghadames (Compiled by the Researcher)

Study	A (Auckland)	B (Bodrum)	C (Middle East)
Reference	(ATEED, 2015)	(Arbak, 2005)	(Sharif, Zain, & Surat, 2010)
Title/ Short Title	People's Panel Survey Auckland's global Identity	An Analysis of Transformation of Urban Identity: Case Study of Bodrum	Thermal comfort and Privacy empowerment by the courtyard in the traditional Arab house
Author(s)	ATEED	Ayşe Arbak	Salem Sharif M. Zain M. Surat
Study Category	Global	Transformational	Environmental
Publication Type	Governmental Study	Master's Thesis	Journal Article
Theoretical Background	Investigating the identity of capital of New Zealand through a survey methodology	Analytical study of the identity transformation	The identity reflected into the intelligence and ability to cope with climate
Findings	Majority of participants indicated that the identity is an important factor in a city and other transformation aspects were studied.	Identity transformation over the several civilizations. Issues with identity resulting from touristic activities.	The courtyard supports the identity need for privacy and environmental adaption

2.2.1 Auckland (A): Survey Methodology to Study Identity

In a study performed by a governmental agency in New Zealand¹, the identity of the capital was studied in 2015 by distributing 4,078 surveys to the residents of the city. However, only 500 were selected randomly in order to enable a controlled analysis of the data. The findings of this study are as the following(ATEED, 2015)¹:

- More than 70% of the participants indicated that it is crucial for a city to have an identity that distinguish it from all other cities locally and globally.
- The participants stated their city's identity is emerging from:

¹ ATEED (Auckland Tourism, Events and Economic Development) is a national agency, which is concerned with developing the economy in the city.

- a) The harbors which are spread around the city.
 - b) The unique coastline.
 - c) Calmness and Outdoor activities which are their favorite and part of their culture.
 - d) Multiculturalism.
- Residents of the city notice a transformation in its identity due to several factors including(ATEED, 2015)¹:
 - a) The increase in population, which is imposing different building styles that may not align with the identity through “infill housing”.
 - b) The change in the way the diversity of the city is formulating with other ethnicities.
 - c) The increase congestions that may affect the calmness of the city.

The study focused on the different aspects of the identity including its physical, environmental and socio-cultural perspectives. The participants were able to identify the harbor and the coastline as physical identity aspects of their city, as well as outdoor activities and multiculturalism as environmental and socio-cultural aspects. Nevertheless, it can be noticed that a transforming identity is a global challenge that is faced in many cities around the world and can be increasingly influenced as the city gets more open to the world(ATEED, 2015)¹.

2.2.2Bodrum’s Case(B): Analysis of Identity Transformation

As part of studying the identity transformation between the old and the new city, a case study by Ayşe ŞebnemArbak as part of her thesis about the identity transformation in Bodrum. The author focuses her study on the following aspects, which are identified as part of the identity concept (Arbak, 2005):

1. Urban Morphology.
2. Urban Functions and Economy.
3. Urban Meanings: Socio-cultural Features.

The author starts by reviewing the characteristics of the city of Bodrum in Turkey considering its location on the coast and surrounded by mountains which she refers that most of them were not inhabited until the 70s of the twentieth century. Therefore, the terrain of the city indicates the harshness of the people as well as the scattered distribution of the houses in the settlement. However, since the city lies on the coast as part of a peninsula, the earlier settlement indicates “ease, wealth and good living”.

In regards to the urban morphology,Arbak (2005) studies the development of urban patterns, the monumental opuses, public areas formation and the landscape features in the city. The area of Bodrum started from its castle “Zephyria. Nonetheless, the urban development of the city started in the 18th century. The urban pattern of the city at the time generally indicates the following:

1. The gardens and yards were established around the houses.
2. West side of the city contains the mosque of the city and the hamam along with other facilities such as water storage systems.
3. No settlements were built on the east side of the town. The author explains that behavior by the early settlers with their need to protect their agricultural lands from strong winds. However, the east side was only chosen by the Greeks in order to use the wind exposure to resist hot climate in the summer.
4. The main neighborhoods of Bodrum were built in the beginning of the 1800’s starting by two areas which their structures of were diverse.
5. The ethnicities that settled in the city were the Greeks who settled on the east side and the Turks who settled on the west side.
6. Due to the nature of the Greek life which revolves around the sea environment, the pathways were built perpendicular to the coast.

The author also studied the public areas formation including the streets and the squares of Bodrum where street patterns and designs were found different from one part of the city to another mostly to empower privacy. Most of the streets were oriented towards the sea to reflect the life orientation of the city’s

inhabitants. The main issue highlighted by Arbak (2005) is “the visual pollution” by advertisements and bill boards that do not contribute to the identity or cope with it.

The author mainly focused on studying the differences and the transformation of the identity from the city as a whole, to the neighborhoods and then the buildings, which she mainly focused on:

1. The types of the houses: Chios, Mezzanine and the Levantine houses, as shown in Figure 2.3.
2. The Facades: comparing the type of external wall finishes and the windows’ sizes.
3. The neighborhood similarities and differences from a cultural point of view.

In order to keep the same architectural spirit of the traditional houses in Bodrum, a development plan was established for the city in order to keep new construction in line with the traditional frame. Therefore, the house dimensions including its color and door and window sizes were specified, which are important steps towards preserving the identity of the city. However, the commercial usage of most of the traditional buildings were considered a risk due to additional “illegal” structure that were built especially at the seaside in addition to the change in the windows’ dimensions and the commercial signage.



Figure 2.3: Types of houses in Bodrum(Arbak, 2005)

In conclusion, there is an apparent attention that is paid to the identity of the city of Bodrum especially from the legislative point of view. Nonetheless, the tourism impact on the city and the commercial use of its buildings are the top challenges that are facing the urban identity of Bodrum. This study adopted a field survey and analytical methodology in order to understand the several aspects of the identity in Bodrum, which is part of the methodology used in this thesis.

2.2.3 Middle East (C): Identity in Coping with the Environment

A study by Sharif, Zain and Surat on the role of the courtyard in achieving thermal comfort and privacy in the traditional houses in the Middle East region. The main purpose of using the courtyard in the Arabic houses is providing the thermal comfort by continuous air circulation throughout the house facilities, in addition to providing acoustic and visual isolation to the inner part of the house which empowers the conservative privacy need in the Middle Eastern culture (Sharif et al., 2010).

From the thermal comfort point of view, the courtyard which is located in the center of the house (see Figure 2.4), maintains shading throughout the day time which makes it the coolest area of the house. Therefore, the courtyard always draws the hotter and more humid air from inside the rooms and pushes it out through the top opening. Moreover, being the center of the inner house facilities, the courtyard separates the private areas of the house from the external facilities which are mostly designated for the guests. Hence, empowering the privacy of the house by total acoustic and visual isolation(Sharif et al., 2010).

This study adopted an analytical methodology of two typical traditional Arab houses with courtyard in order to understand the role of the courtyard in supporting the two important characters of the Arabic identity, which are thermal comfort and privacy.



Figure 2.4: The courtyard in the traditional Middle Eastern houses (Sharif et al., 2010)

2.3 Conclusion Remarks about the Identity Studies

Through studying the city identity in its theoretical context, as well as the specific research of its application on the global, transformational and environmental extents, it is evident that applying the specialized studies adopted unified division of the identity dimensions; physical, environmental, socio-cultural and economic. Therefore, the same division will be followed in this study in line with the architectural consensus.

Firstly, the Auckland study confirmed that a survey methodology is a credible way to evaluate the identity and its transformation in urban developments as the survey participants were able to identify the physical, environmental and socio-cultural elements that forms their city's identity. Moreover, the Bodrum identity study is a comprehensive model to follow as it covers all the identity dimensions. Starting with the physical dimension, the Bodrum study started to analyze this aspect from the outside to the inside; starting with the urban morphology and reaching to the house types in the city. Nonetheless, the Bodrum study analyzed the historical and current city identity elements and the way it transformed.

Finally, the traditional Middle Eastern house study performed by Sharif et al. (2010) illustrated that the identity can be objectified through the adaptation measures that the original inhabitants of the city took in order to cope up with their specific environmental and socio-cultural needs. Thus, this study establishes the connection between the urban identity elements, especially the relation between the physical, environmental and socio-cultural dimensions, as the physical identity existed as a reflection to the other identity dimensions.



CHAPTER 3

IDENTITY AND CHANGE IN GHADAMES

This section of the research is a continuation of the identity study in general, which is directly related to the case study of Ghadames. The geographical and historical backgrounds are reviewed along with applying the identity elements and concepts that were previously studied in the second chapter. Moreover, the

transformation of the identity between the old and new cities of the settlement will be examined against the physical, environmental and socio-cultural elements.

3.1 Location of Ghadames

The settlement of Ghadames is located at a crossroad between Libya, Tunisia and Algeria, and currently located within the Libyan borders, as shown with a red pin in Figure 3.1. The geographic location of the settlement is within 30.108 to 30.153 North, and 9.476 to 9.515 East, with an elevation of 360 meters above sea level (Allafi, 2012).



Figure 3.1: Location of Ghadames in North Africa(Almansuri, Dowdle, & Curwell, 2008)

The city is classified as an oasis, where its location at the trading roads between three countries gave it commercial and economic importance, in addition to its strategic position that allowed the merchants from the city to control trading from the depth of Africa to the coastline (Mattingly & Sterry, 2010). Figure 3.2 shows

the location of Ghadames on the North African trading routes in the 19th century. Furthermore, the current population of Ghadames is approximately 22,100 as of 2003 mainly relying on tourism and agriculture(Algouri, 2004).

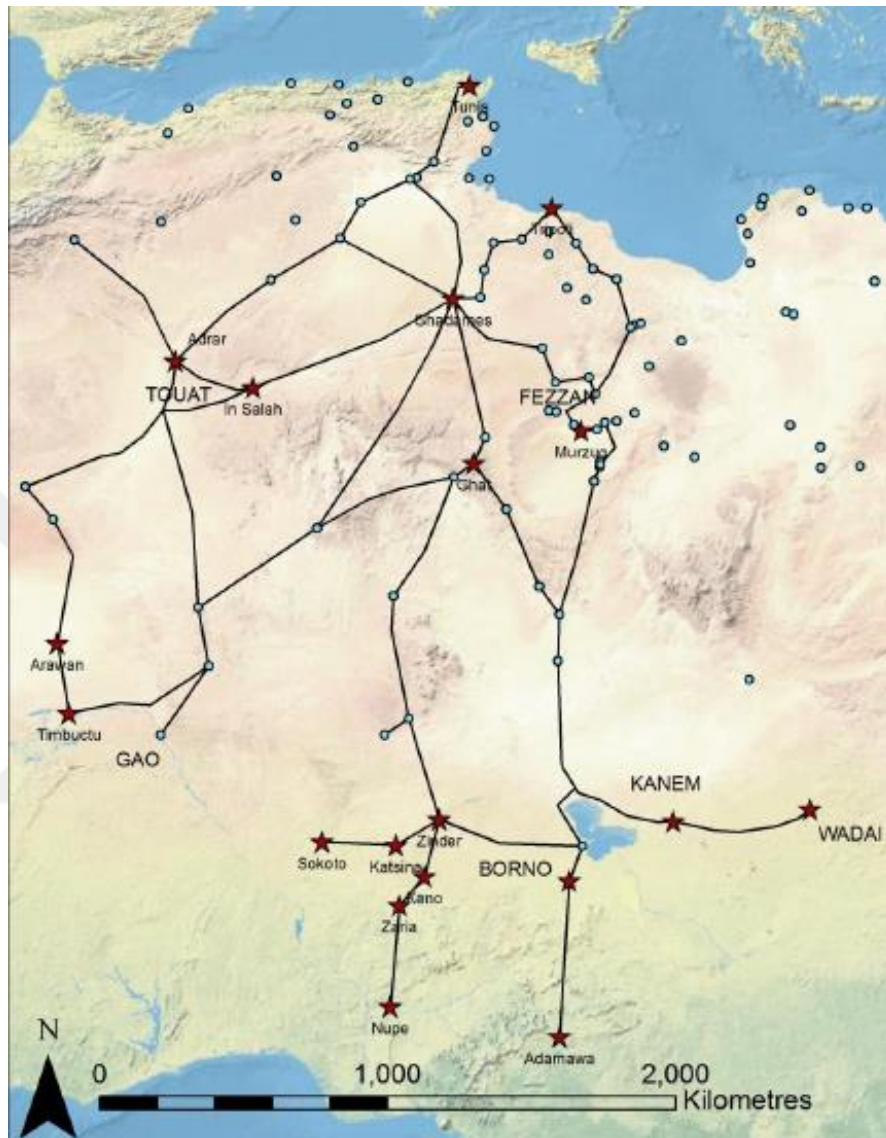


Figure 3.2: Ghadames’s strategic trading location (the stars indicate where the merchants of Ghadames controlled the trading activities) (Mattingly & Sterry, 2010)

3.2 Historical Background of Ghadames

The first aspect to be studied is the name of the settlement, which is said by the Arabs to be taken from a myth story of its establishment. The myth says that some people from the time of the grandson of prophet Noah were travelling from a route passing by Ghadames, where they stopped for rest and a meal. The travelers

said that they had forgot an item there, so one of them said “we forgot it where we had our lunch yesterday”, which translates in Arabic to “Ghada-ams”(Khuja, 2004). However, historical experts rejected this myth on the grounds of the unreachability of Arabs to the region at that time. Moreover, the archeological experts refer the title of the settlement to the Roman names “Cydamus” or “Cidame”, who was a roman prince born in the first century AD(Aztaf, 2015). Furthermore, the city is inhabited by two main tribes, which are BeniOulid and BeniOuazit(Mattingly & Sterry, 2010). There are sub-families that are related to the two tribes, which each of them inhabited different parts of the old city as shown in Figure 3.3

Other sources indicate that the historic city was found in 8th century BC around its famous water spring called “Ain Al Faras”, concurred by Romans in the beginning of AC, who gave it its current name, and built in its current form during the Islamic Caliphate era in the 7th century AD (Abufayed, 2005). Due to the importance of the settlement, many missions had been carried out to study the archeological, historical and geographic features of the area in the 19th century, which the most famous ones were as the following (Mattingly & Sterry, 2010):

1. Alexander Gordon Laing, who spent 3 months in the old town and briefly described the outlines of the city without much details on most of it.
2. Richardson, who spent several months in 1848 in the old city and did not provide the awaited details.
3. Five missions sent by France in 1856, 1861, 1862, 1875 and 1911, which most of them targeted information about the commercial activities in and through the settlement. Figure 3.4 shows two portraits produced from the French missions which reached Ghadames on 1862 and 1875.

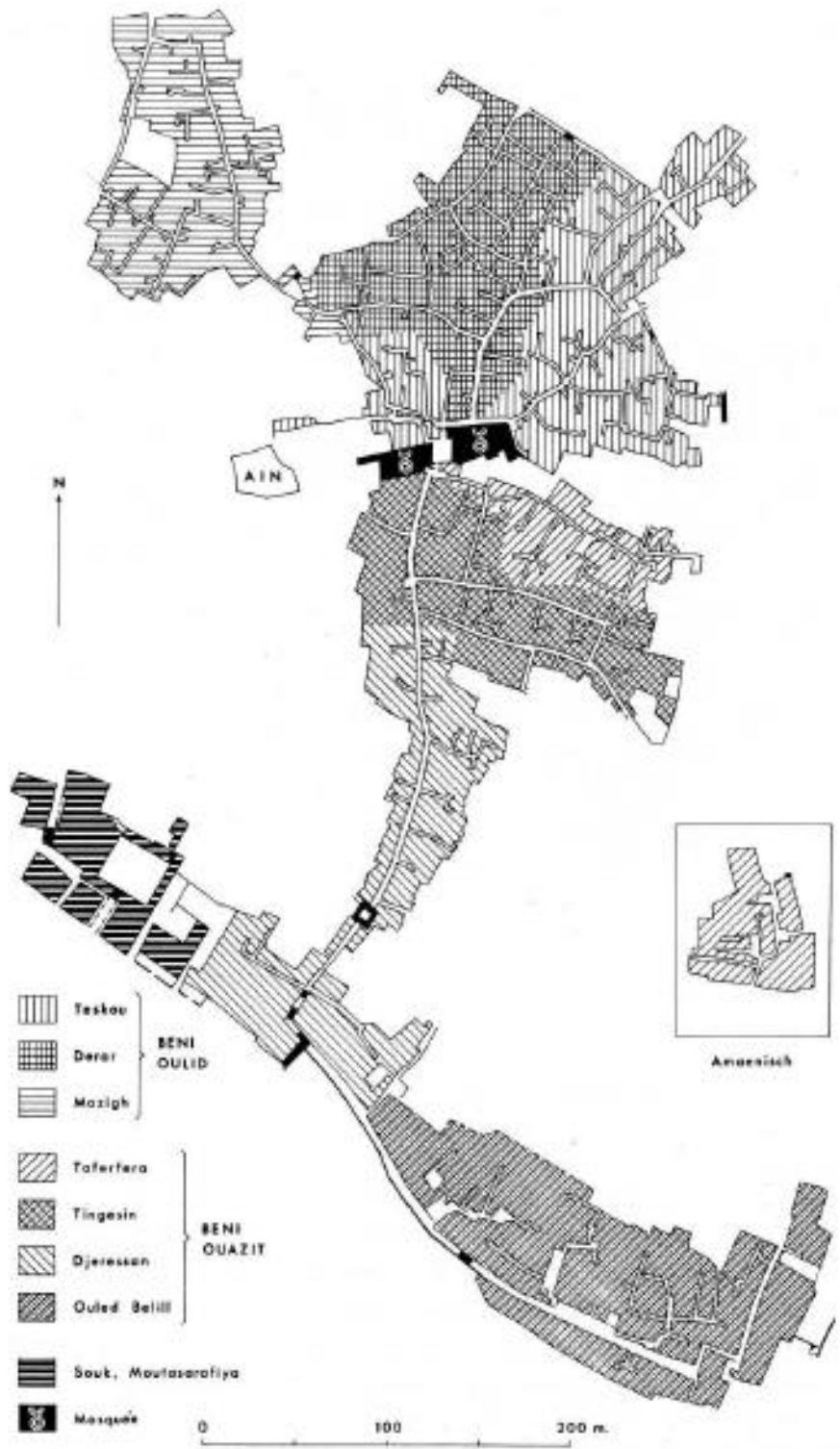


Figure 3.3: The tribes of Ghadames in the old city (Mattingly & Sterry, 2010)



Figure 3.4: Portraits from the French missions dated on 1864 and 1877, respectively, of the outer walls of Ghadames(Mattingly & Sterry, 2010)

The old city continued to preserve its position as an important settlement in the Sahara area during the Italian, French and British existence in the region during the first half of the 20th century (Mattingly & Sterry, 2010). Figure 3.5 shows an aerial view of Ghadames old city in 1943. During the Italian and French colonization of the region, there were no major changes applied to the city. However, a hotel adjacent to the old city was built by the Italians.

Moreover, the construction of the new city started in 1975 and finished in 1983, which was built at the South wall of the old city. Building the new city provided the modern comfort to the inhabitants of the old city. However, the new built environment did not take the full original identity of the city into consideration (Azzuz, 2000). Figure 3.6 is an aerial picture taken of the old town and shows the new Ghadames development at the bottom of the picture.



Figure 3.5: The old city of Ghadames in 1943 (Mattingly & Sterry, 2010)



Figure 3.6: A recent aerial picture of Ghadames (Retrieved from Google Earth on 5 March 2017)

Two adjacent parts (Right: old city and left: new city) separated by a road. The old city is not accessible by care due to the narrow streets and alleys.

3.3 Identity and Transformation

In studying the identity of the city and transformation in the identity of both parts of the city, the concepts are applied as the following:

1. The original identity of the city by studying the physical, environmental and socio-cultural aspects of the old part of the city in comparison with the current identity dimensions in the new city.
2. The transformation of the identity by studying the changed aspects of the new part of the city.

Figure 3.7 shows the plan of Ghadames and the urban morphology in the old and new parts, the minimal distance between the old and new parts of the city reflects the strong tie between them.

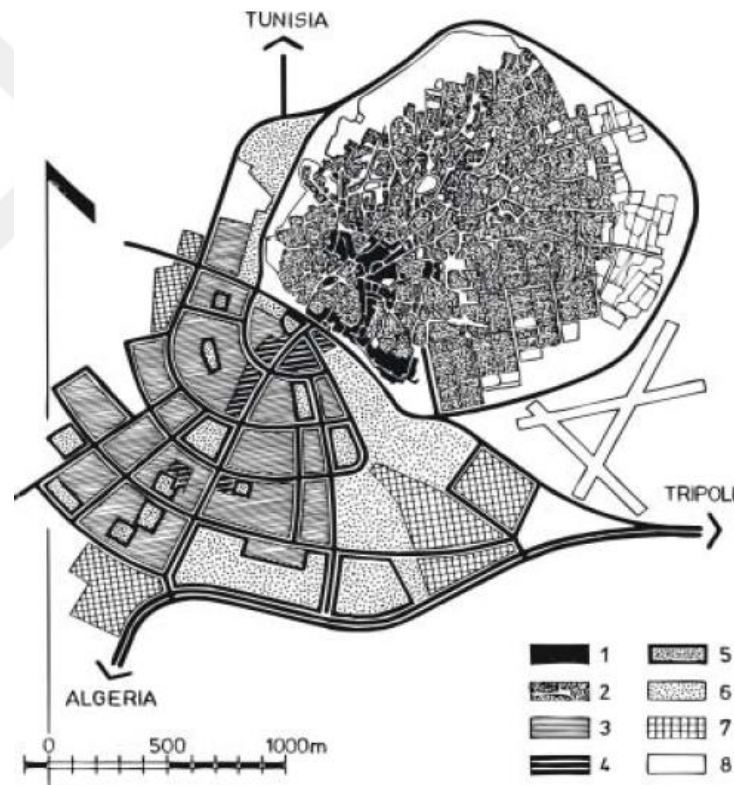


Figure 3.7: Urban morphology in old and new Ghadames(Chojnacki, 2003)

(1) Old Ghadames (2) Oasis and agricultural area (3) Residential area in New Ghadames (4) The current city center (5) Civic services (6) Gardens (7) Industrial zones (8) uninhabited desert

3.3.1 Identity of the City in its Physical Aspects

The identity of the old city of Ghadames will be reviewed through its detailed elements and competencies, and then judged using the identity's physical aspects criteria as described in section 2.1 of this study. Through studying the urban morphology of the old city, there are 4 main elements that are vital to the physical aspects of Ghadames, defining it as an oasis, which form layers from the inside to the outside of the city as the following (Abufayed, 2005):

1. Ain Al Faras Spring is old oasis centering (Figure 3.8), which forms the core of the city and is identified as the main reason for its existence.
2. The building structures of Ghadames, which include houses, markets, walkways and mosques.
3. The oasis, which is the vegetation area of the city dominated by palm trees.
4. The external walls of the settlement, cemeteries and other archeological features from the pre-Islam period called "Asnam"(Mattingly & Sterry,2010).



Figure 3.8: Ain Al Faras, the main water source and the center of the old city of Ghadames, after restoration works(GDA, 2007)

Moreover, the building structures of the city form a compatible formation, which can be studied in the following order according to the privacy feature that is identified as a key identity feature for Ghadames(Algouri, 2004):

1. Public areas and neighborhoods.
2. Streets and alleys.
3. Houses.

Figure 3.9 shows an aerial view of the old city after restoration works by the Libyan government in 2007 (GDA, 2007).



Figure 3.9: Aerial view of the buildings of the old city after the completion of restoration works(GDA, 2007)

3.3.1.1 Public Areas and Neighborhoods

The main areas to be studied are the public squares of the city, which contained the commercial activities of the city. The city was famous for being a hub and a controller for the commercial activities between the depth of Africa and the coastal line, which formed the gate to the European continent. Figure 3.10 shows a current picture of Al Qadous square, which is one of the most important squares

in old Ghadames due to its commercial and social usages. Figure 3.11 shows a portrait of the Souk square drawn by European missions to the old city in the 19th century and 3.12 shows a picture of the square in the current time after restoration works.

The main feature that is noticed on the squares in Ghadames is the accessibility, which is provided through alleys penetrating the walls that surrounds them. Such a design gives the squares of the city the sense of privacy and exclusivity, which eventually empowers the security and control by the city inhabitants. These squares were used by the native people daily, in addition to merchants from outside of the city, for trading, public meetings and special occasions (Fteita, 2012).



Figure 3.10: The current view of Al Qadous Square (Researcher's collection)



Figure 3.11: A public square in old Ghadames as portrayed by Richardson in the 19th century (Mattingly & Sterry, 2010)



Figure 3.12: The same square of Figure 3.10 after restoration works(GDA, 2007)

The neighborhoods of the old city are divided between the two main tribes that established it, BeniOulid and BeniOuazit, which was shown previously in Figure 3.3. Each part of the city has its mosques and market squares, and connected with a network of streets, between neighborhoods, and alleys, within the single neighborhood. This formation supported the design of the city for privacy, segregation and security from external residents and visitors, and within the same tribe areas, which contain the close families within the tribes (Abufayed, Rghei, & Aboufayed, 2005).

Furthermore, due to being an invaluable resource in the desert, the old residents of the city built a unique water distribution system from Ain Al Faras, which is the main spring of the city, to the different parts and sections. The water is mainly distributed to two main parts, which are the houses and public areas for cleaning, drinking and cooling, and the agricultural area for irrigation according to the crop type water needs (Abufayed, 2003).

This smart water distribution system helped the settlement to achieve its sustainability despite the harsh environmental conditions surrounding it. Moreover, the water distribution channels are connected to a control system called “the water clock” (see Figure 3.13), which is controlled by a person that monitors the water volumes to each area, which allows the water flow to the dedicated area according to a certain schedule. The inhabitants of the old city used to use a “flag system”, where a sign is sent with the water stream to notify the farmers that the water is about to stop in order to be supplied to other areas.



Figure 3.13: The water clock/ water distribution system in Ghadames (Researcher's Collection)

The picture shows the water clock supervisor, who times the water flow to each area and uses the flag system, as explained earlier, for notification.

Additionally, the underground water distribution system contributes into preserving a balanced humidity in the indoor environment of the city while simulating a continuous air circulation, which keeps the temperature of the city spaces cool during the harsh weather conditions (Alabid, Taki, & Birgit, 2015). Figure 3.14 shows a schematic of the channels flow from Ain Al Faras spring through the underground system using gravity.

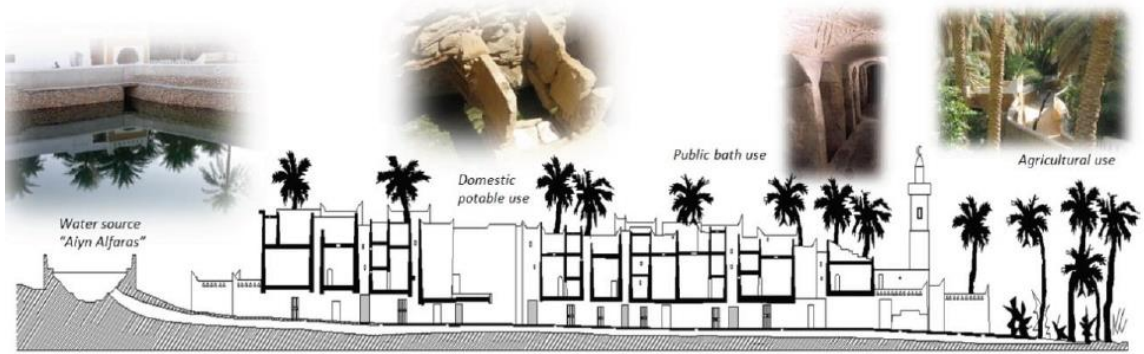


Figure 3.14: Ghadames water distribution system (Alabid et al., 2015)

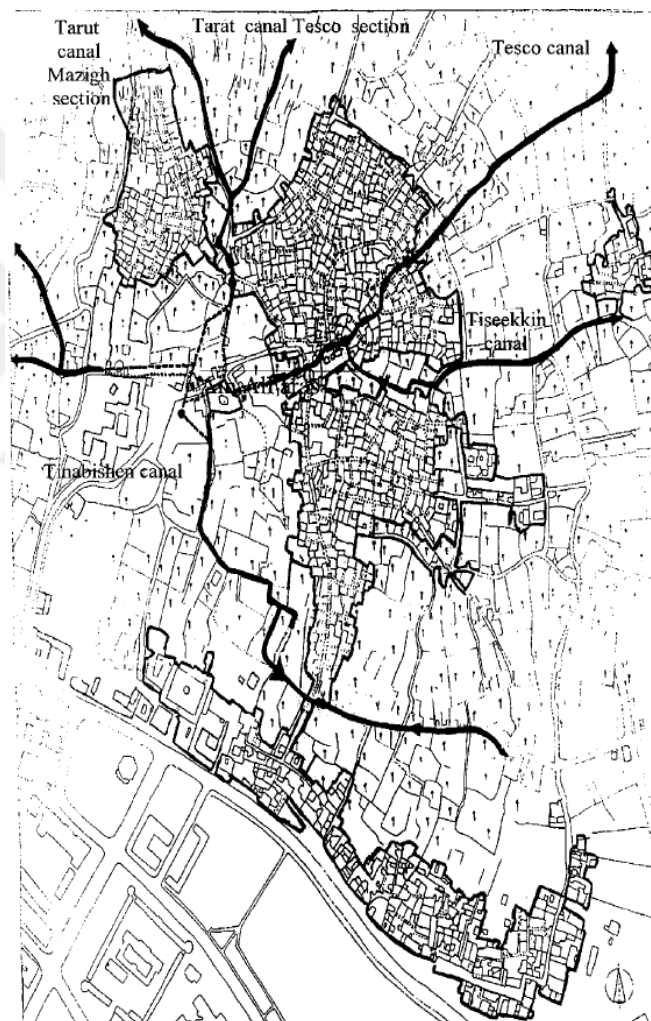


Figure 3.15: Plan of the underground water channels in old Ghadames, Abufayed (2003)

As shown in Figure 3.15 the old Ghadames underground canal system consists of two main components, which are:

1. The main Channels: five main channels named Tarat, Tesco, Tinabishen, Tinejawan and Tindafran(Dwie, 2009)
2. Secondary channels: that run from the main channels and branch out under the houses to deliver the water to agricultural areas (Abufayed, 2003)

3.3.1.2 Streets and Alleys

The streets of the old city were divided into two main categories, which form a unified unit of transportation between the different parts of the city and within the neighborhoods of the city. The city streets and alleys are featured by the following:

1. Gradual narrowing from 3 meters to less than one meter as per the privacy requirements (Abufayed, Rghei, & Aboufayed, 2005).
2. Side covering by the external walls of the houses and top covering by roofs, which supported the security and privacy of the city (Fteita, 2012).
3. Seating areas for social meetings and elderly along the passages which are concentrated around public facilities such as mosques and disappear towards the narrow alleys (Abufayed et al., 2005).

4. Gradual curving along the paths to slow down high wind speeds to an acceptable cooling breeze (Fteita, 2012).
5. Ventilation openings in the roofs every 15 meters on average to provide natural lighting and ventilation, known by the local name Tinnaot (Fteita, 2012). Moreover, bigger courtyard openings were provided in the back area of the houses to provide the same features of the ventilation openings as shown in Figure 3.16.

Figures 3.17, 3.18 and 3.19 show the different features of the streets and alleys of the old city. The streets and alleys of old Ghadames are categorized also under three types (Fteita, 2012):

1. The main street, which is divided into four axes:
 - a. From South East (Nader Gate) to North West (Jarsan Gate).
 - b. From South (Jarsan Gate) to North (City Centre).
 - c. From South East (City Centre) to North West (dead end at Houda Alley).
 - d. From South West (City Centre) to North East (Andelad Alley).
2. Feeding Streets to the neighborhoods, which are of an irregular pattern.
3. Connected alleys, which have dead ends and connect 3 to 9 houses on average.



Figure 3.16: The big opening (Tinnaot) in between the houses' rears for ventilation and lighting at certain points at the streets(Researcher's collection)



Figure 3.17: Natural lighting and ventilation openings at the roofs of the streets (Tinnaot) (Fteita, 2012)

These openings are used as part of the ventilation and natural lighting system of the city.

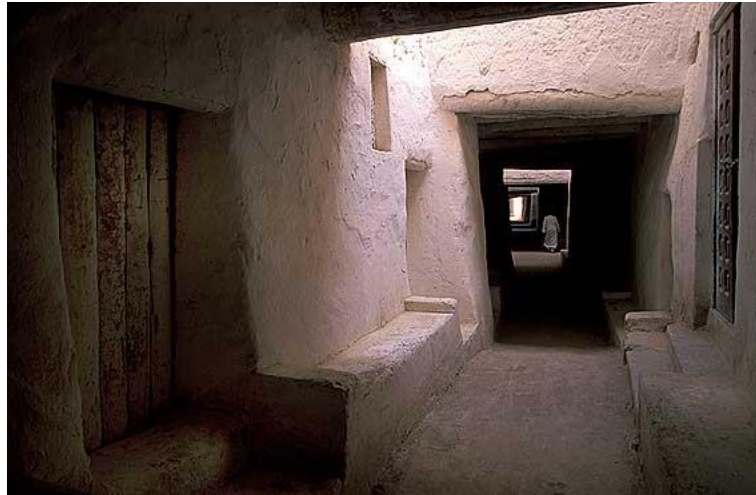


Figure 3.18: Main street in Ghadames featuring the curvature and the seating areas with access to houses along the way(Fteita, 2012)

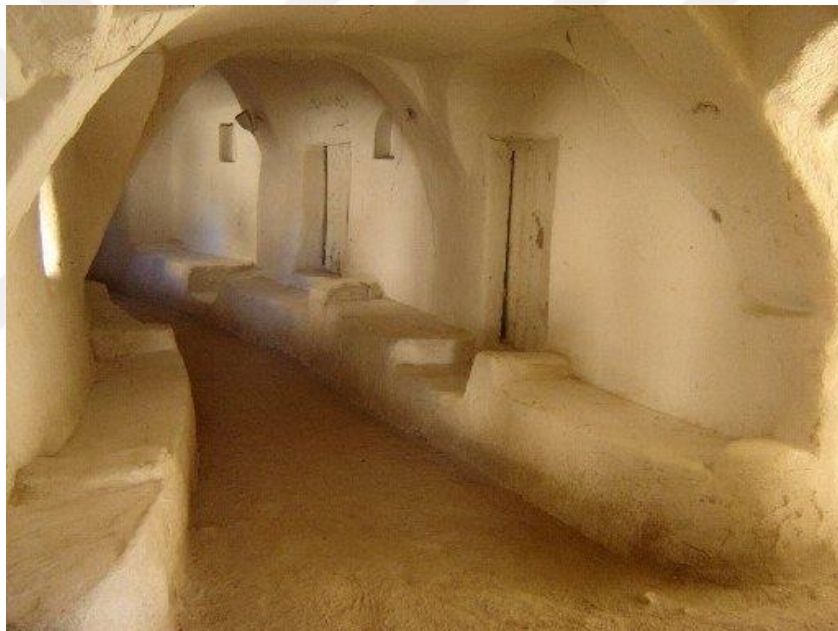


Figure 3.19: The alleys of old Ghadames (Researcher's collection)

3.3.1.3 Houses

The houses of old Ghadames are a continuation of the privacy, thermal adaption and security identity features of the city unit. Additionally, the houses of the old city provide natural lighting and division plans, which utilizes the available resources at the construction time in the comfort and functionality of the house.

The average floors area of the houses is 60 m², ranging from big to small houses depending on the number of family members and the social status of the residing

family (Abufayed et al., 2005). However, the internal layout of the houses can differ depending on the preference of each family, which could form an ultimate number of variations. Figure 3.20 illustrate a floor plan and a section for a traditional house in Ghadames. Figures 3.21 and 3.22 show a different variation of the house internal layout in a cross-section and floor plans, respectively. Moreover, Figures 3.23 and 3.24 shows illustrations of the old houses of Ghadames by the missions that visited the city.

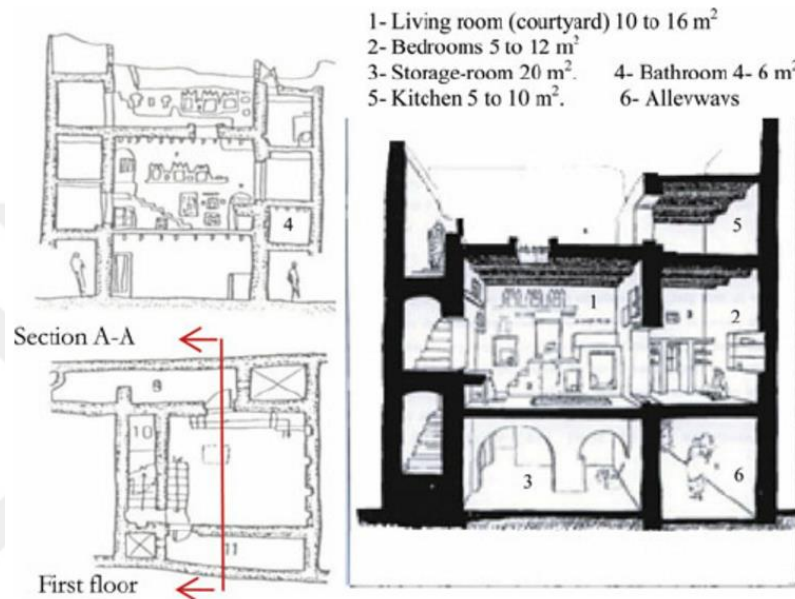


Figure 3.20: Floor plan and section of old houses in Ghadames (Alabid & Taki, 2014)

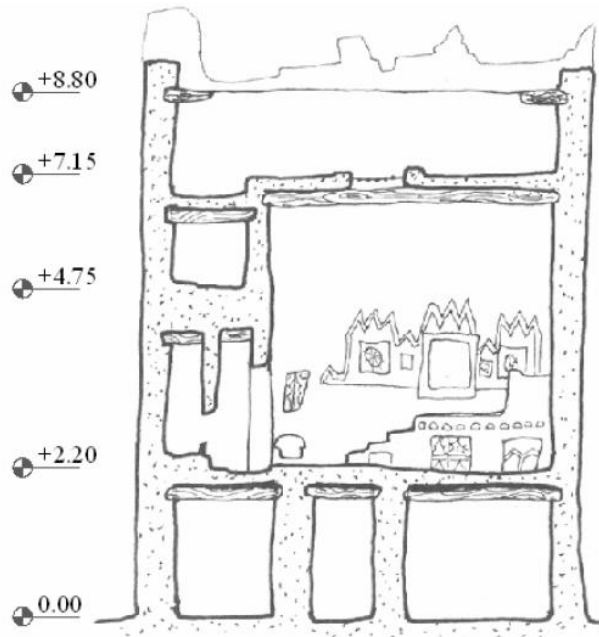
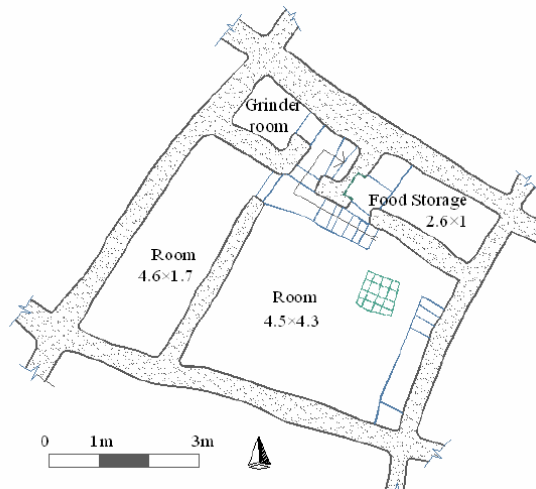
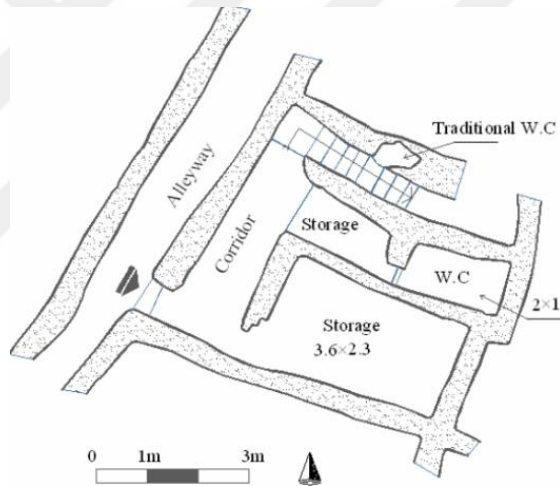


Figure 3.21: Cross-section and elevations of a house in old Ghadames(Elwefati, 2007)



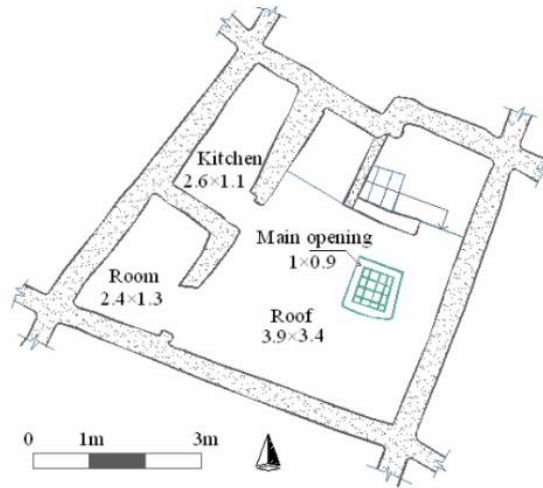


Figure 3.22: Floor plans of a house in old Ghadames – ground floor, first floor and roof floor (Elwefati, 2007)

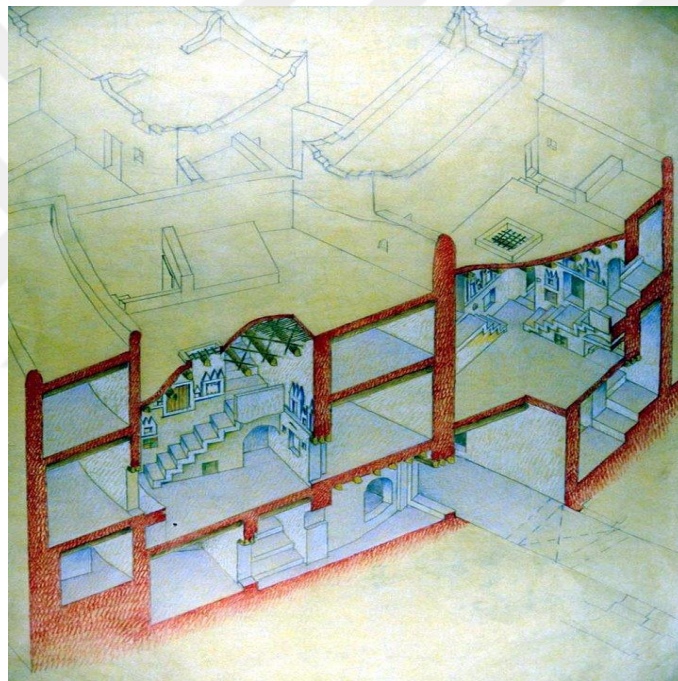


Figure 3.23: An illustration of the internal layout of the houses in old Ghadames (researcher's collection)



Figure 3.24: A painting by Giorgio Pamella illustrating the internal layout of the old houses in Ghadames (researcher's collection)

The entrance from the streets and alleys to the house starts with the ground floor, which is the main storage area, acting as a vestibule. The stairs to the first floor, which are located at the back side of the house, lead to the living room, bed rooms and rest room. Using the stairs up to the roof, the kitchen and another open-roof seating area is located surrounded with high walls. The formation of the houses in old Ghadames mainly empowers the privacy and segregation of the family from strangers and city residents, which could be clearly seen by facing the street entrances with the storage area, compacting the main living spaces in the first floor, and the high walls on the roof(Algouri, 2004). Nonetheless, the edge of the roof walls' upstands on top of the houses in old Ghadames is similar in form to the previously studied inBodrum houses. However, the upstands took mainly a pointy shape at the top to facilitate the collection of the rain water and directing it to the water storage and distribution system in the city.

Furthermore, the design of the house in old Ghadames provides natural lighting, thermal comfort and ventilation for the house around the year time by

implementing a roof opening at the soffit of the first floor, known by the local name Tinavot, which guarantees a continuous airflow from the alleys to the soffit opening, and indirect sunlight into the house that reduces the sun heat and provides the needed lighting during day time as shown in Figures 3.25 and 3.26(Alabid & Taki, 2014). The idea of the courtyard is implemented in the houses in Ghadames for the purpose of environment adaption that serves comfort and privacy. However, the soffit and wall openings in the houses and the streets are implemented in a different way with smaller sizes, compared to the traditional Middle Eastern courtyard as shown earlier in Figure 2.4, that achieves the required functionality. Moreover, the compacted clustering of the houses keeps the cold temperature within the city environment and pushes it through the ventilation openings through the houses and out from the soffit openings (Almansuri et al., 2008).

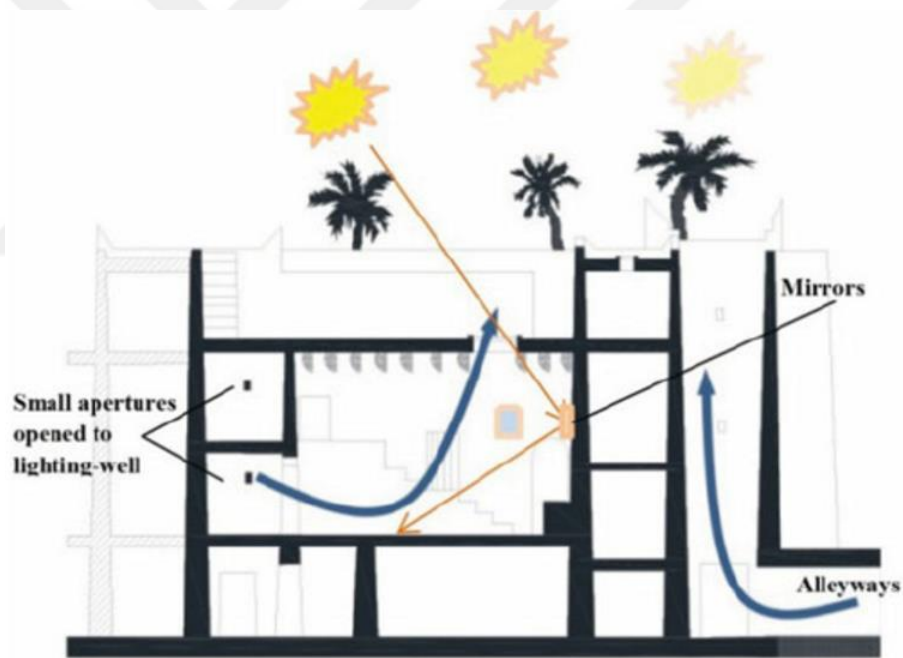


Figure 3.25: Thermal and lighting in old city houses (Alabid & Taki, 2014)

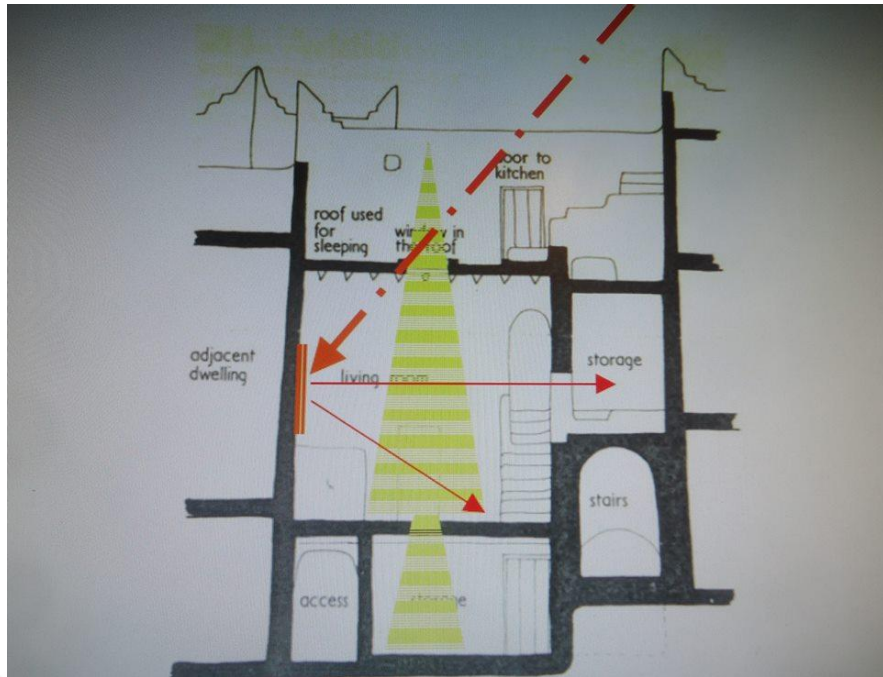


Figure 3.26: Lighting distribution in the houses of old Ghadames (Researcher's collection)

Moreover, the traditional interior finishes and colors in the houses of the old city of Ghadames is closely tied to the environment of the city. The white color of the internal and external walls prevents the sun light and heat absorption, which is not wanted in the desert environment. Additionally, the traditional decorations of the houses mainly focus on the red color, which reflects the color of the soil existing in the oasis, and contrasting colors, which reflects the Amazigh origins of the settlement's inhabitants (Fteita, 2012). Figure 3.27 shows an entrance to a traditional house in Ghadames.



Figure 3.27: An entrance to a house in old Ghadames(Fteita, 2012)

The old houses in Ghadames had many features that optimized the interior environment in adaption to the desert environment. For instance, traditional houses contained small windows for natural lighting and ventilation in addition to the roof main opening discussed earlier as shown in Figure 3.28.





Figure 3.28: Wall and ceiling openings (Tinavot) in traditional houses (Elwefati, 2007)

The top left picture shows the wall openings, which were used for air circulation. The other two pictures are the ceiling openings (from the inside and outside), which were used for ventilation and lighting. Both openings are 40 cm x 40 cm on average.



Figure 3.29: Internal decoration in traditional house in Ghadames(Elwefati, 2007)

Furthermore, the traditional house in Ghadames is unique for its white interior with ornamental decorations in the walls and lintels' accents as shown in Figure 3.29. The ornamental decorations mainly are drawn in red color and decorated with identical metal objects, mirrors and contrasts from other colors, which are mainly yellow, blue and green emerging from the nature and the Amazigh culture of Ghadames(Elwefati, 2007).

The houses in old Ghadames are made of natural material available within its environment. The walls are constructed on stone foundations until a close depth to the earth surface, then built up by interlocking adobe bricks glued by mud mortar in between, which are finished off with mud mortar. Figure 3.30 shows the making of adobe bricks as part of the restoration works of the old city. The ceilings are made of palm trees' trunks and leaves, and then finished from the top with mud mortar (Abufayed, 2005).



Figure 3.30: Adobe bricks production as part of the restoration works (Auroville Earth Institute, n.d.)

Mud is poured into square forms, which are then left under the sun heat to dry. At the restoration works, adobe bricks were tested for absorption and resistance, which showed suitable results of Ghadames’s environment (Auroville Earth Institute, n.d.).

3.3.1.4 Identity Physical Features in Old Ghadames

Further to studying the components forming the identity in the old city, these components are assessed against the physical identity indication elements that were reviewed in (Pazhuan, et al., 2015) as shown in Table 3. Therefore, the old city of Ghadames satisfies all the physical identity indicators, which makes its identity unique and suitable for the environment and socio-cultural factors of its inhabitants.

Table 3: Analysis of physical identity indicator in old Ghadames. Developed from (Pazhuan, et al., 2015)

Physical Identity Indicator	Compliance	Features
Homogeneity between identity elements	Yes	All physical identity features form continuation from one element to another in the same manner, features and design purpose.
Buildup creating spatial identity	Yes	The physical identity components from Urban morphology, public facilities, to the houses support the identity need of Ghadames for security, privacy and adaption to the environment.
The contrast of the identity elements while keeping unity	Yes	There is a contrast between the way the houses represent the most private areas of the city, while the public spaces support the open trading activities of the city. This creates contrast, while preserving unity between all the elements.
Link between identity elements forming one unit.	Yes	There is a strong connection between each progressing identity element to another. As each element cannot serve the identity purpose without the other, this keeps them as one unit.

Table 3: Analysis of physical identity indicator in old Ghadames. Developed from (Pazhuan, et al., 2015)

Physical Identity Indicator	Compliance	Features
Proportion suitability between structures and inhabitants	Yes	The sizes, areas and dimensions of the old houses in Ghadames have equal proportions, which are suited to the compact design and the inhabitant's average size.
Seamlessness in development	Yes	The old city does not show any differences between its parts as it was built over 100 years or more.
Privacy definition in identity elements	Yes	The inhabitants of old Ghadames clearly identified the purpose of the city designs, which mainly support privacy, security and environmental adaptation.
Uniqueness of structures	Yes	Serving as a hub for trading activities, the elements forming the design of the city is inspired by many cultures including Amazigh, Sahara and Islamic, which makes the combination unique. Moreover, the adaptation to the environment in an oasis and the specific uncopied structures.

3.3.2 Identity of the City in its Environmental and Socio-Cultural Aspects

As identified in chapter two of this research, the socio-cultural and environmental aspect of the city identity are closely connected, where both get effected from the physical identity of the city. Therefore, as the physical identity of Ghadames is reviewed, the socio-cultural and environmental elements are evaluated in Table 4. The table was developed based on the environmental and socio-cultural identity elements provided in Butterworth (2000) and Uzzell, Poland Badenes (2002), and subsequently each element was evaluated based on the previously studied information in the literature. However, most of these elements can only be evaluated through the methodology adopted in this research due to the gap created by the lack of studies of the identity of Ghadames, and should be bridged through the course of this study.

Table 4: Theoretical evaluation of socio-cultural and environmental aspects of identity in Ghadames. Developed by the author based on criteria from Butterworth (2000); Uzzell et al. (2002)

Socio-Cultural and Environmental Identity Element	Element Description	Evaluation of the elements in Ghadames
Curiosity and confidence	The city's environment keeps its residents interested in pursuing life in the place, while reserving their confidence in life and future	As it could retain its economy and population until the beginning of the 20 th century and unavailability of surveys that provides the residents' opinions, the old city can be considered successful in this element. However, the status of this element should be evaluated in this research.
Community sensation	Illustrated by the extent of feeling, where everyone in the city belongs to the bigger community and is aware of the needs and challenges that face the group. This element is found to have direct and indirect impacts on the unity of the physical aspects of the identity	The closeness of the physical elements of the city indicates strong community sensation. However, the status of this element will be further evaluated during this thesis.
Physical events	Events that promote a more collective participation between the community members, the more the identity is strengthened in its environmental and socio-cultural aspects	The community is considered as a consolidated, yet open community. The main events that illustrated through weddings, which witnesses the illustration of the city's traditions.
Security	The physical environment of the place, which empowers the safety of the community. This element is related to the social interactions and trust between the community members.	The old city neighborhood formation empowered security in the old town. However, the security in the new part will be further evaluated in this study.
Privacy empowerment	One of the natural and personal needs of humans, privacy need to be supported by the way the living space and neighborhood are designed. Failing to achieve the satisfactory sense of privacy may lead to weakened social ties within the community	This aspect is clear in the old city as a stringent requirement of the culture of the city. The increase of the privacy is apparent from the public spaces to the houses in the city. Privacy of the new development will be evaluated in this study.

Table 4: Theoretical evaluation of socio-cultural and environmental aspects of identity in Ghadames. Developed by the author based on criteria from Butterworth (2000); Uzzell et al. (2002)

Socio-Cultural and Environmental Identity Element	Element Description	Evaluation of the elements in Ghadames
Involvement and sense of self-importance	An essential need to psychologically healthy community, which cherish the sense of belonging to the identity. The individuals of the community need constant indications that they are important in their environment and they have influence on the lifestyle and socio-cultural activities	This element will be evaluated in this study.
The geographic limits of the place	The nature of the community and the way the inhabitants form their physical elements to suite the environment	The geographic limits are identified and environment is identified as a desert oasis. The old city is designed to fit this identity. However, the new city will be further evaluated in this research.
The social solidity between the community members	The extent of security, privacy and unity sensation	The physical aspects reflect the closeness of the old city residents through the compact cluster design. Nevertheless, this element will be evaluated further for the new development.
The satisfaction of the community collectively and individually	The confidence, involvement and sense of self-importance of the society in their identity	This element will be evaluated in this study.

3.4 The Transformation in the Identity between Old and New City

The new city built in the 70s and 80s of the previous century, have considered some of the identity elements that were implemented in the traditional buildings of the old Ghadames. However, the new houses were constructed using modern technology and ignored many of the important features and intelligent design elements implemented in the old city.

3.4.1 Transformation in the Physical Aspects

In regards to the urban morphology, the new city lacks the layer's concept that was implemented in the old city as shown in Figures 3.7. The new city mainly places houses in blocks surrounded by main streets, and gradually moves from Northern West to Southern East from residential and civic services areas to gardens and industrial zones. The new city failed mainly in using the same urban morphology of the old city, which helped in protecting the old city from the desert wind and dust(Elwefati, 2007). Figure 3.31 shows the role of the old city's urban morphology in protecting the city from the desert nature, i.e. wind speed hindered by the palm trees surrounding the old city.

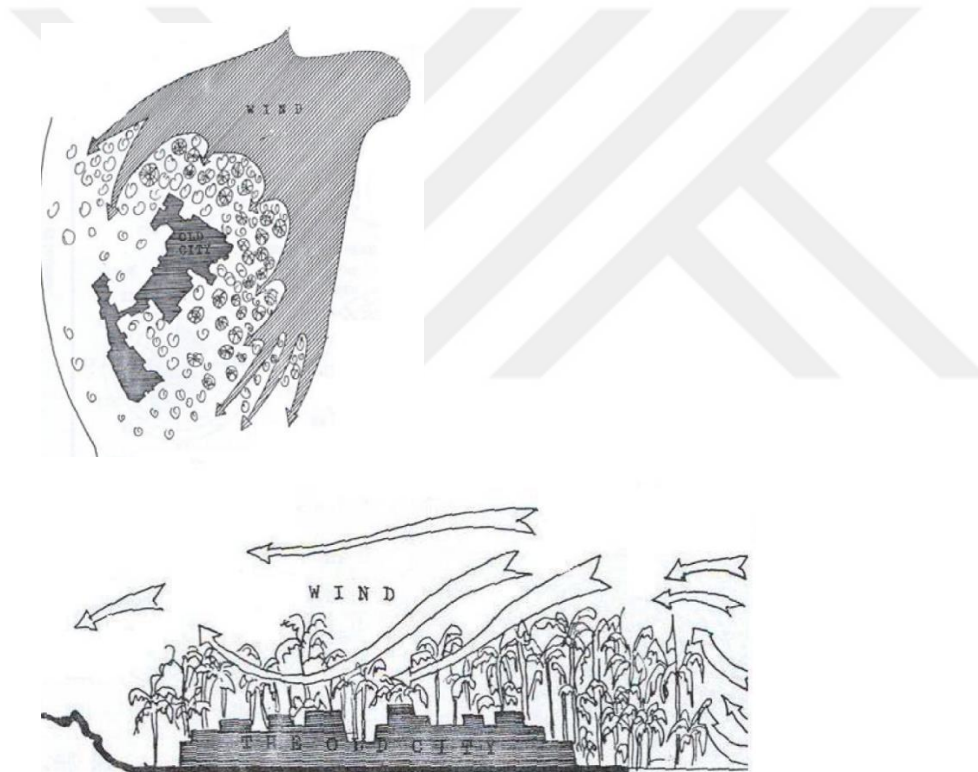


Figure 3.31: The role of the urban morphology of old Ghadames in coping with reducing wind speed in the desert environment (Elwefati, 2007).

Moreover, the streets in the new city are divided into two main types, which are:

1. Main streets connecting city parts and residential blocks.

2. Passage ways between houses within the same residential blocks as shown in Figure 3.32

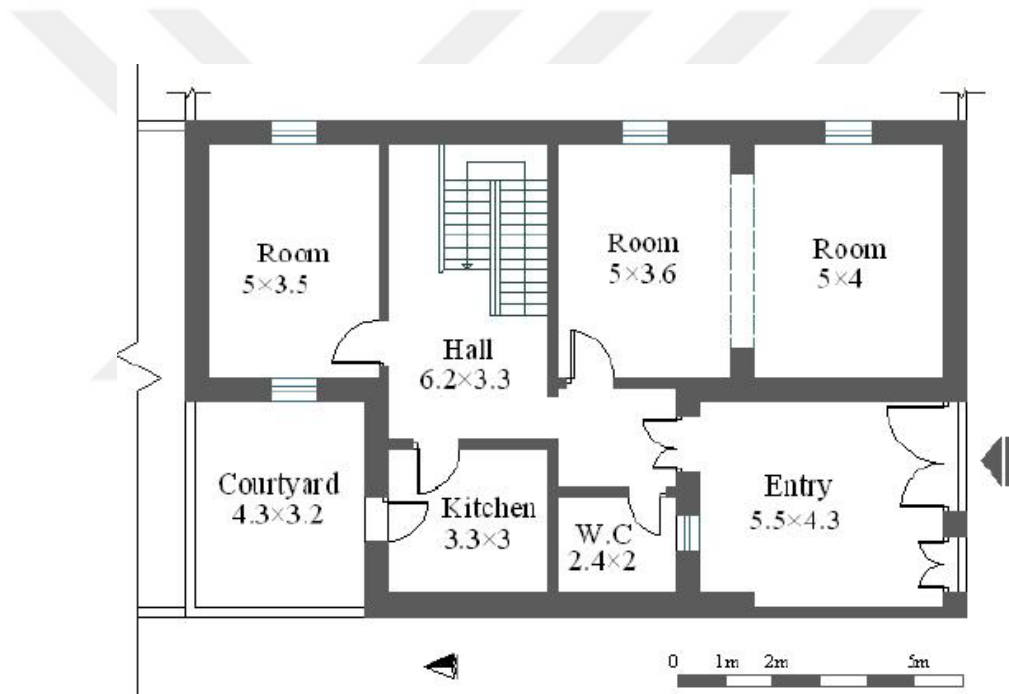
Nevertheless, the main streets do not have the same traits of its counterpart in the old city, and the passage ways gives the same impression as the ones in the old city. However, the passage ways are mainly for easy transportation, with the lack of:

1. The compact ceiling opening for lighting and ventilation, which are substituted with big openings that do not fulfill the same purpose.
2. Seating areas, which were asocializing and resting tools for the city residents.
3. Support for compact design as the new passage ways are wide compared to the ones in the old city and do not take the same narrowing strategy from the public to the more private areas.
4. Accesses to the houses, which are transformed to the uncovered main streets as shown in Figure 3.32 below.



Figure 3.32: Main streets into the passage ways in new of the city (Elwefati, 2007)

Furthermore, the houses in the new city take a different design concept than the houses in the old city with an average total floor area of 300 m². As shown in Figure 3.33, the entrance of the house is divided into two main entries for vehicles and individual use. The new houses consist of two floors, where the privacy of the home is mainly achieved through the entry courtyard. Nevertheless, the ground floor is also utilized for the living room, bedrooms, kitchen and toilet, which were in the first and roof floors of the traditional houses. Moreover, the first floor is the main floor for the family with several bedrooms to provide comfort for the residents, while the roof floor is mainly dedicated for services away from the original concept of the roof in the traditional houses in Ghadames.



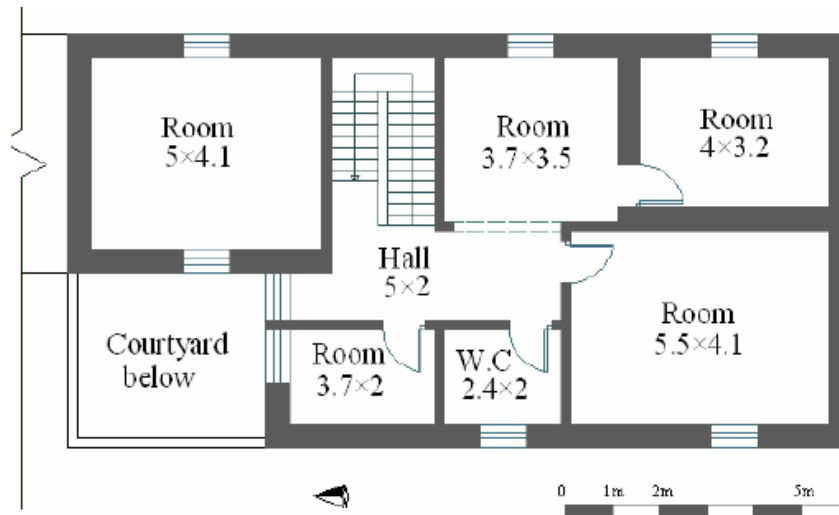


Figure 3.33: The internal layout of houses in the new city (above: ground floor, below: first floor) (Elwefati, 2007)

In comparison with the houses in the old city, the houses in the new city are totally different from the design perspective, except for the few similarities in the appearances. For instance, the covered alleys in the new city are meant for aesthetic and transportation purposes, rather than using them as part of a ventilation or lighting system as seen before in the old city. Furthermore, the interior of the houses in the new city is designed for a modern and spacious lifestyle, equipped with mechanical ventilation and electrical lighting systems. On the contrary, the interior of the houses in the old city was observed to be compact and utilizing natural sources for ventilation and lighting.

Table 5 compares the old and new houses in Ghadames in terms of internal layout, structural elements, building material and services (Elwefati, 2007). The table is developed based on elements provided by (Elwefati, 2007) and other criteria in the literature.

Table 5: Physical elements comparison between old and new city inGhadamesDeveloped from Elwefati (2007) and from the researcher’s background

Element	Old City	New City
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Table 5: Physical elements comparison between old and new city in Ghadames Developed from Elwefati (2007) and from the researcher's background

Element	Old City	New City
Houses' Internal layout	The room sizes can reach as low as 1.4 m and the biggest room is the first floor living room with an average length and width of 4 m. Doors average size is 1.7 m x 0.8 m, while windows vary in size with average dimensions of 20 cm x 75 cm.	Room sizes and halls have a minimum of 2 meters, while the main rooms have an average size of 4 m x 5 m. Doors are 2.2 m x 1m for personal use, in addition to a vehicular entry. Windows have a unified size of 1 m x 1 m.
Houses' Structural elements	Internal and external walls have similar thicknesses that range between 40 to 60 cm and carry the weight of the house.	Concrete structure with the loads carried by ceilings, beams and columns to the foundation.
Houses' Building material	Foundations are made of volcanic stone. Walls are out of adobe bricks. Ceilings compose of palm trees wood, leaves and finished from the top with adobe.	Reinforced concrete for the structural elements. Hollow cement blocks for the walls. Waterproofing by liquid applied agents. Thermal insulation by polystyrene on top of the roof slab.
Houses' Services	No water supply in toilets or rooms. Each house had a simple sewerage system of a sand filled sump pit. Natural lighting and ventilation through wall and roof openings, and reflective high wall mirrors.	Electric, water supply, sewerage and cooling and ventilation systems. Gas is provided through pressured gas bottles.
Street Layout and paving	Narrow and compact design to support the ventilation and cooling system of the city, and to protect houses from the environment. The streets and alleys are made for pedestrian use and they are too narrow for vehicles.	Designed for vehicular use with pedestrian sidewalks. The streets are made of asphalt material and the sidewalks are made from artificial stone. Parking is available around houses, markets and municipal services' areas.
Green Areas	Oasis farms surrounding the city, which were used for agriculture and protection from desert wind. The old inhabitants of Ghadames used to use the farms for recreation and entertainment.	Manmade parks equipped playgrounds and few agricultural areas.

Table 5: Physical elements comparison between old and new city in Ghadames Developed from Elwefati (2007) and from the researcher's background

Element	Old City	New City
Public Areas and markets	The several squares at the conjunctions were used as marketplaces and event areas.	Dedicated buildings for markets distributed around the new city. Few facilities are available for weddings and events.

In studying the thermal comfort design, which is one of the key identity comparison points between the old and new development of Ghadames, a case study by Abubaker Shawesh is chosen, which examines the impact the Libyan hot and dry climate on the traditional and the contemporary houses of Ghadames city (Shawesh, 1993). The study also researches the consideration of the environmental aspects in both house types in the city. Furthermore, it was found that the traditional houses were designed to minimize solar radiation and direct sunlight exposure, where the contemporary houses do not take these criteria into consideration and fully depend on the mechanical systems to balance the environmental impacts for the residents. The traditional houses mainly use compact structures, thick walls and narrow, covered and ventilated streets in order to protect the houses from the extreme weather conditions. Moreover, the roof openings, skylights and small window openings reduced the acceleration of heating during the daytime and contributed to the thermal comfort of the houses.

On the other side, the climatic challenges were not considered in the design of the contemporary houses of the city. The houses are separated from each other with wide streets, which increases the sun and heat exposure from all sides of the structures. The windows are large and contribute to increasing the temperature of the houses in an accelerated manner which requires installing air conditioning services to balance the trapped heat. Subsequently, the usage of air conditioning units resulted into producing more heat in the outside environment, and with using thin walls, it can be concluded that the contemporary houses in Ghadames city are not adapted to the local environment and on the contrary negatively contributed into the identity of the ancient city.

Furthermore, more studies were conducted in comparison between the old city and the new city in terms of privacy and the efficient use of the natural lighting, where studies showed the original dwellers' successful trials to achieve these important features in the city. In the new city, the privacy of the house is achieved through the entry courtyard, which is a similar concept to the ground floor storage areas of the traditional houses. However, lighting is mainly achieved through electric systems, while a back courtyard is built in some houses at the back to provide natural lighting to some rooms (Algouri, 2004; Alabid et al., 2015).

3.4.2 Transformation in the Socio-Cultural and Environmental Aspects

There is a clear gap in this area within the literature, which is targeted to be bridged through this research. Moreover, as shown in Table 3.2 previously, many of the transformation in the socio-cultural and environmental aspects of the identity between the old and new city must be assessed through the case study of this thesis. However, the physical identity of the old city implies a strong social, cultural and environmental identity for the city in the different criteria set by Butterworth (2000) and Uzzell et al. (2002).

Moreover, there are several similarities and differences between the consideration of the environmental dimension of the identity in Ghadames between its old and new parts as shown in Table 6.1.

Table 6: Environmental elements identity comparison (Adopted from Figure 2.2)

Environmental Element	Old City	New City
Geology	An oasis built around a water spring. Agriculture is suitable to the geology of the city.	The new city is built beside the old city without any consideration to the geological nature.
Geography	Located on a cross road between the desert and the coastline to support the trading activities of the city.	Located at the southern edge of the old city to facilitate access to the old city.

Table 6: Environmental elements identity comparison(Adopted from Figure 2.2)

Environmental Element	Old City	New City
Topography	A nucleus formation from the inside out to ease living of the city residents and empower privacy and security.	Municipal Services are in the center of the city. However, industrial areas are located to the East of the new city.
Climatic	Several considerations for ventilation and water distribution to support the oasis nature of the city.	Mainly depend on modern systems for ventilation and water distribution, disregarding the old solutions.



CHAPTER 4

INHABITANTS' SURVEY IN GHADAMES

Following the theoretical study of the identity in Ghadames, this research includes a field assessment in order to measure many of the identity aspects, which formed a gap within the literature about the city. This section elaborates on the research methodology design and parameters, followed by the findings of the field assessment.

4.1 Case Study and Sampling Method

In order to support the results of this study, a field survey is conducted through distributing a questionnaire to the residents of Ghadames in order to assess their

perception about their identity, the physical identity, the environmental identity, and the socio-cultural identity of the different parts of the city from their own point of view.

Therefore, the sample is selected from the current residents of the city, however, a convenient sampling method was adopted, where the researcher considered the following in the selection process:

1. Include the old people of the city, who can read and write, in order to acquire the knowledge of the old city and movement experience to the new city.
2. Include participants from other age categories in order to measure the change in identity in the population.
3. Establish a balance between the two genders.

The questionnaire forms were distributed in physical forms to the participants and collected by the researcher, who is a resident of Ghadames.

4.2 Selection of Case Study

The study case was selected based on the following factors:

- The importance of the subject as an issue that triggers the attention of Architects and designers around the world.
- The importance of the study is based on the importance of the city as classified as one of the oldest and continuously inhabited cities in the world.
- The issues arising regarding the identity and the comfort in the built environment in the city of Ghadames.
- The lack of studies that analyze the identity of Ghadames which also consider the perception of the city's residents as part of the identity concept.
- The identified gap within the study about the environmental and socio-cultural elements of the identity in Ghadames and its transformation between the old and new parts.

4.3 Questionnaire Design

This part of the study is performed in order to set the questionnaire design parameters that assess the identity and its transformation in Ghadames. The questionnaire (template available as Appendix 1) is designed into four main parts, which are as the following:

1. Demographics and inhabitants' Evaluation
2. Identity in the old city
3. Identity in the new city
4. Parts comparison and transformation

The intent of the research is not only to measure the effectiveness of the old city design versus the new city design, and compared to each other, but also the perception of the inhabitants about the identity of their city and the transformation between its different parts. The answers to the questionnaire questions are either a Likert scale (Agreement), yes and no answers, or multiple choices. Therefore, the questionnaire sections are designed as the following:

Demographics and Inhabitants' Evaluation

The questionnaire establishes basic demographics which are gender and age category. The purpose of these questions is to assess the different responses between genders and the time identity perception through different generations. Thus, the gender is divided to males and females, while the age categories are divided into an average of 15 years' intervals. Other demographic information such as marital status, ethnicity, and profession are not included due to irrelevancy.

The second part of this section assesses the relation between the participants and the city with its different parts, where they are asked about their location preference within the city, the place where they spend most of their time and the reason behind it, and the way they perceive the relation between the old and new parts of Ghadames.

Questions about the Old City

The questionnaire then proceeds to investigate the inhabitants' identity perception in the old city. First, they are asked if they, or any of their related people have ever lived in the old city, which gives their opinion credibility through their own experience. Thereafter, the participants are asked their opinion of key identity characters in Ghadames derived from the different elements of identity, which are privacy, social life, public spaces, internal home space and home decorations.

Moreover, the participants are asked if the houses in the old city are able to satisfy their current needs, through the different solutions of keeping the original design or adding developed services in order to ease life in the traditional context. Nevertheless, the participants are also asked if the internal spaces and water system within the old city can still satisfy their daily life needs. The main purpose of this section is to understand the way the people of Ghadames understand their identity, its importance, and the way they adapt their original identity to fit their changing needs.

Questions about the New City

The section starts by asking the participants about their family members that moved into the new city, once the adjacent development was completed, and the way they feel the connection between the old and new parts of the city, and between themselves and the old city. Furthermore, the participants are asked about their lifestyle in the new city and their favorite character that makes it unique derived from the different elements of identity, including life comfort, life easiness, public facilities, overall appearance, and houses internal spaces. Finally, the participants are asked about one of the important traits of the identity of their city as an oasis, which is the water distribution system, which was observed as unique in the old city.

Questions Evaluating the View of the Respondents

The researcher designed most of the questions in this part to put similar elements head to head with each other in order to measure the inhabitants' preferences. The

elements are derived from the physical, environmental and socio-cultural elements of the old city in comparison with their counterparts in the new city. These elements are summarized in Table 7

Table 7: Identity comparison questionnaire design

Questionnaire Element	Related Identity Element	Identity Dimension
Security	Security	Socio-cultural
Ease of life	The satisfaction of the community collectively and individually	Socio-cultural
Social life	The social solidity between the community members	Socio-cultural
Appearance perception	Curiosity and confidence	Socio-cultural
Privacy	Privacy empowerment	Socio-cultural
Courtyard, balconies, and public facilities	Houses' Internal layout and public areas	Physical
Windows	Houses' service	Physical
Ventilation system	Houses' services and climate	Physical and environmental
Streets	Public areas	Physical

Table 7: Identity comparison questionnaire design

Questionnaire Element	Related Identity Element	Identity Dimension
Water distribution system ²	Climate, geology and geography	Environmental

4.4 Surveyed Sample

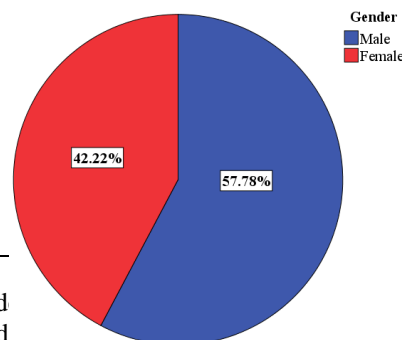
The current population of Ghadames is estimated to be 25,000 people. The survey was executed from December 2016 to January 2017, where 110 questionnaires were distributed, which forms a targeted sample percentage of 0.44%. In February 2017, 91 questionnaires were complied, one of the received questionnaires was disqualified for incompleteness, which resulted a final sample size of 0.36% and a response rate of 82.73%. At a 50% response distribution, the confidence level for the questionnaire results would be at 91.05%. Through SPSS the Cronbach's alpha was found as 0.649, which is considered as an acceptable consistency for the research.

4.5 Findings and Analysis

The questionnaire responses are entered into IBM SPSS and analyzed according to the results needed on a question by question basis. This section will review the statistics of the complied responses in preparation for the analysis and discussion section.

4.5.1 Demographics and Inhabitants' Evaluation

Out of the 90 qualified questionnaires, the gender of the participants is distributed into 57 males and 33 females, which correspond to the percentages illustrated in Figure 4.1. Moreover, Figure 4.2 shows the distribution according to age category.



²This element is evaluated und questions, but will be discussed

questionnaire as two separate

Figure 4.1: Gender distribution of the participants

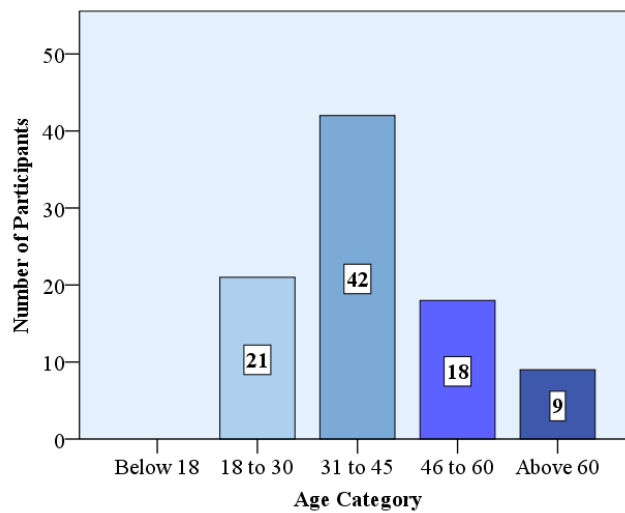


Figure 4.2: Agedistribution of the participants

In the following question, the participants were asked about their preferred part of the city for living. The results showed a massive majority that prefers living in the new city with 96.7%. Table 8 summarizes the outcomes. The results are not surprising as the old city is uninhabited currently. However, the results showing such a percentage of preference indicates the existence of issues that could be discovered through the course of the questionnaire results.

Table 8: Preferred city part by the survey participants

Responses	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Old City	3	3.3	3.3	3.3
New City	87	96.7	96.7	100.0
Total	90	100.0	100.0	

The participants were asked if the old and new buildings of the city seem to complete each other and if they look similar from the exterior design perspective, 62.2% showed an agreement that the two city parts are considered as one unit and

they complete each other, as seen in Table 9, while 74.4% indicated that they agree that the two parts of the city look similar, as seen in Table 10. Nonetheless, in both questions, the partial agreement percentages were 41.1% and 51.1%, respectively, which may indicate that the inhabitants see a certain gap between the two parts of Ghadames in terms of exterior design.

Table 9: The old and new buildings in Ghadames complete each other

	Responses	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I Totally Agree	19	21.1	21.1	21.1
	I Partially Agree	37	41.1	41.1	62.2
	I Don't Know	6	6.7	6.7	68.9
	I Partially Disagree	4	4.4	4.4	73.3
	I Totally Disagree	24	26.7	26.7	100.0
	Total	90	100.0	100.0	

Table 10: The exterior design of the two parts of Ghadames look similar

	Responses	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I Totally Agree	21	23.3	23.3	23.3
	I Partially Agree	46	51.1	51.1	74.4
	I Don't Know	6	6.7	6.7	81.1
	I Partially Disagree	7	7.8	7.8	88.9
	I Totally Disagree	10	11.1	11.1	100.0
	Total	90	100.0	100.0	

At the last part of this section, the participants were asked about the part of the city where they prefer to spend their time, results shown in Table 11 with 90% of the participants preferring to spend their time in the new part of Ghadames. Nonetheless, when each group were asked for the reasons of their preference, the participants who prefer spending their time in the old city indicated with a 100% response that the old city provides them with the comfort and calming they need away from noises of the new city, as shown in Table 12. However, the participants who indicated their preference to spend their time in the new city

selected the availability of the needed services and the availability of work opportunities with 75.3% and 60.5%, respectively for each reason, as shown in Table 13.

Table 11: Preference for spending time in the old and new city

Responses	Cases Valid	
	N	Percent
Old City	9	10.0%
New City	81	90.0%
Total	90	100.0%



Table 12: Reasons for spending time in the old city

	Responses	Percent of Cases		
		N	Percent	
	I like the design and facilities of that area	1	7.1%	11.1%
Reasons for old city preference	I feel more comfortable spending my time in that area	9	64.3%	100.0%
	There are many things I need/want that are only available in that area	3	21.4%	33.3%
	I work in that area	1	7.1%	11.1%
	Total	14	100.0%	155.6%

Table 13: Reasons for spending time in the new city

	Responses	Percent of
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		N	Percent	Cases
	I like the design and facilities of that area	19	11.9%	23.5%
Reasons for new city preference	I feel more comfortable spending my time in that area	31	19.4%	38.3%
	There are many things I need/want that are only available in that area	61	38.1%	75.3%
	I work in that area	49	30.6%	60.5%
Total		160	100.0%	197.5%

4.5.2 The Old City

The first question in this section asked the participants if they ever lived in the old city, where 46.7% have indicated that they did, as shown in Table 14. Using Spearman correlation, the age category was correlated with the fact that the participants have lived in the old city producing a correlation factor of -0.683, as shown in Table 15, which indicates that the highest two age categories have lived in the old city. These results mean that the range starting from the fourth age category, 46 and above, represent the inhabitants that moved from the old city to the new city of Ghadames. The negative correlation value indicates the reverse relation between the two variables, which means as the age value is higher, the participants have chosen a lower value assigned to yes (1) on IBM SPSS, no answers have an assigned value of 2, for living in the old city.

Table 14: Participants who have lived in the old city

	Responses	Frequency	Percent
Valid	Yes	42	46.7
	No	48	53.3
	Total	90	100.0

Table 15: Correlation between age category and living in old city of Ghadames

Correlations	Age Category	Ever lived in old city
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Spearman's rho	Age Category	Correlation Coefficient	1.000	-.683**
		Sig. (2-tailed)	.	.000
	N		90	90
	Ever lived in old city	Age Category	Correlation Coefficient	-.683**
Sig. (2-tailed)			.000	.
N		90	90	

** . Correlation is significant at the 0.01 level (2-tailed).

The lowest age categories of the participants had their grandparents, parents, uncles and aunts living before in the old city, while their friends and cousins only lived in the new city. Nonetheless, the highest age categories had all their related people residing in the old city before.

Furthermore, in studying the most important identity characters in the old city, privacy and security showed the highest agreement rates, as part of the socio-cultural elements, followed by the social life and internal home decorations. The responses to the identity elements' questions are illustrated in Table 16.

Table 16: The importance of identity characters in the old city of Ghadames

Responses		I totally Agree	I partially Agree	I don't know	I partially Disagree	I totally Disagree
Privacy	N	63	17	7	0	3
	Percent	70.0	18.9	7.8	0.0	3.3
Social life	N	62	18	7	1	2
	Percent	68.9	20.0	7.8	1.1	2.2
Public Spaces	N	42	34	12	1	1
	Percent	46.7	37.8	13.3	1.1	1.1
Security	N	63	15	8	2	2
	Percent	70.0	16.7	8.9	2.2	2.2
Internal home space	N	38	17	26	4	5
	Percent	42.2	18.9	28.9	4.4	5.6
Interior home decorations	N	61	19	9	1	0
	Percent	67.8	21.1	10.0	1.1	0.0

Moreover, the participants were asked if the houses in the old city can fit for the current needs of the inhabitants under three different cases:

Case 1: The houses of the old city satisfy the current needs of the city inhabitants.

Case 2: The houses of the old city satisfy the current needs of the city inhabitants after adding modern services.

Case 3: The houses of the old city can never satisfy the current needs of the city inhabitants.

Table 17: Satisfaction of houses in the old city for the current inhabitants' needs

Responses		I totally Agree	I partially Agree	I don't know	I partially Disagree	I totally Disagree
Case 1	N	11	16	12	18	33
	Percent	12.2	17.8	13.3	20.0	36.7
	Cum %	12.2	30.0	43.3	63.3	100.0
Case 2	N	27	31	19	4	9
	Percent	30.0	34.4	21.1	4.4	10.0
	Cum %	30.0	64.4	85.6	90.0	100.0
Case 3	N	48	31	3	3	5
	Percent	53.3	34.4	3.3	3.3	5.6
	Cum %	53.3	87.8	91.1	94.4	100.0

The results of Table 17 show that 56.7% of the participants disagree that the old houses of Ghadames can satisfy the current needs of the inhabitants (Case 1), while 87.8% agree that they can never achieve their satisfaction (Case 3). However, 64.4% of the participants think agree that by adding modern services to the houses in the old city, their current needs can be satisfied (Case2).

The last part of this section asks the participants about two identity elements, which are the internal spaces of the houses and the water distribution system, and their ability to satisfy the current inhabitants' needs. The responses to these two questions are illustrated in Table 18, where the responses to both questions show 82.2% and 56.7% disagreement rates, respectively.

Table 18: Satisfaction of the internal spaces and water distribution system in the old city for the current inhabitants' needs

Responses		I totally Agree	I partially Agree	I don't know	I partially Disagree	I totally Disagree
Internal Home Spaces	N	3	12	1	13	61
	Percent	3.3	13.3	1.1	14.4	67.8
	Cum %	3.3	16.7	17.8	32.2	100.0
Water System	N	15	16	8	6	45
	Percent	16.7	17.8	8.9	6.7	50.0

Cum %	16.7	34.4	43.3	50.0	100.0
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4.5.3 The New City

The participants indicated that most of their related people have lived on currently living in the new part of Ghadames, which is a result of the mass movement from the old part around 40 years ago. Moreover, the of the most important questions is the emotional tie between the inhabitants of the new part with the old part of the city. The results, Table 19 shows that the new city keeps Ghadames' inhabitants tied to their old city as 66.7% of the participants confirmed their agreement on the statement.



Table 19: The new city keeps the inhabitants' ties with the old city

	Responses	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I Totally Agree	26	28.9	28.9	28.9
	I Partially Agree	34	37.8	37.8	66.7
	I Don't Know	7	7.8	7.8	74.4
	I Partially Disagree	5	5.6	5.6	80.0
	I Totally Disagree	18	20.0	20.0	100.0
	Total	90	100.0	100.0	

Furthermore, examining the identity and lifestyle in the new city of Ghadames, the participants were asked to rate their agreement on the characters that they favor in that part of the city. Table 20 below illustrates the results of the question, while all of the characters scored an agreement percentage with a minimum of 74.5%.

Table 20: The importance of identity and lifestyle elements in the new city of Ghadames

Responses		I totally Agree	I partially Agree	I don't know	I partially Disagree	I totally Disagree
House comfort	N	68	17	3	1	1
	Percent	75.6	18.9	3.3	1.1	1.1
Modern life	N	36	36	4	7	7
	Percent	40.0	40.0	4.4	7.8	7.8
Public Spaces	N	41	31	9	2	7
	Percent	45.6	34.4	10.0	2.2	7.8
Physical Appearance	N	41	26	16	3	4
	Percent	45.6	28.9	17.8	3.3	4.4
Internal home space	N	61	17	9	0	3
	Percent	67.8	18.9	10.0	0.0	3.3

Similar to the question in the old city, the participants were asked to provide their agreement that the water distribution system in the new city satisfies the current needs of the inhabitants. Table 21 shows that the majority of the participants are satisfied with the water system in the new city, however, from the researcher's background and the disagreement rate of 22.2%, there are some parts of the new city that experience disruption in the water supply utilities.

Table 21: Satisfaction of the water distribution system in the new city for the current inhabitants' needs

Responses		I totally Agree	I partially Agree	I don't know	I partially Disagree	I totally Disagree
Water System	N	40	25	2	3	20
	Percent	44.4	27.8	2.2	3.3	22.2
	Cum %	44.4	72.2	74.4	77.8	100.0

4.5.4 Comparison of Old and New City

This section of the questionnaire contains two main parts;

1. City and house facilities preferences in the old and new city.

2. Comparing identity elements from different dimensions between the old and new city.

In Table 22, the evenly distributed preferences, leaning towards agreement, of the inhabitants of different facilities within the city parts indicate that they were all chosen based on personal preferences rather than indicating the opinion regarding the identity. There is no doubt that the included facilities within this question are not related directly to the identity elements, however, the results show that the participants made no relation between the physical elements of the new city and the physical elements of the old city.

Table 22: Facilities' preferences by the participants

Responses		I totally Agree	I partially Agree	I don't know	I partially Disagree	I totally Disagree
Courtyard (old city)	N	25	24	24	2	15
	Percent	27.8	26.7	26.7	2.2	16.7
Small balcony (new city)	N	17	22	26	6	19
	Percent	18.9	24.4	28.9	6.7	21.1
Big balcony (new city)	N	34	22	23	3	8
	Percent	37.8	24.4	25.6	3.3	8.9
Public outdoor facilities (new city)	N	24	15	35	4	12
	Percent	26.7	16.7	38.9	4.4	13.3
Public indoor facilities 1* (new city)	N	23	28	30	0	9
	Percent	25.6	31.1	33.3	0.0	10.0
Public indoor facilities 2* (new city)	N	27	15	42	3	3
	Percent	30.0	16.7	46.7	3.3	3.3

* Refer to Appendix 1 for questionnaire detailed questions

Table 23: Comparison of general identity elements between the old and new parts of Ghadames

Responses			I totally Agree	I partially Agree	I don't know	I partially Disagree	I totally Disagree
Security	Old	N	60	9	9	3	9
		Percent	66.7	10.0	10.0	3.3	10.0
	New	N	12	37	7	11	23
		Percent	13.3	41.1	7.8	12.2	25.6
Life easiness	Old	N	13	25	4	13	35
		Percent	14.4	27.8	4.4	14.4	38.9
	New	N	65	15	2	1	7
		Percent	72.2	16.7	2.2	1.1	7.8
Social life	Old	N	68	10	5	2	5
		Percent	75.6	11.1	5.6	2.2	5.6
	New	N	12	37	2	19	20
		Percent	13.3	41.1	2.2	21.1	22.2
City Appearance	Old	N	65	20	1	1	3
		Percent	62.2	22.2	1.1	1.1	3.3
	New	N	14	49	4	9	14
		Percent	15.6	54.4	4.4	10.0	15.6
Privacy	Old	N	50	17	10	4	9
		Percent	55.6	18.9	11.1	4.4	10.0

New	N	18	28	13	10	21
	Percent	20.0	31.1	14.4	11.1	23.3

Moreover, several identity elements were put in comparison with each other between the old and new parts of Ghadames. Table 23 shows that the participants believe that the old city provided them with better security, social life and privacy, while having a better physical appearance. Nonetheless, the participants indicated that the new city provided them with an easier life compared to the old city of Ghadames.

However, based on a comparison between few of the special identity elements of Ghadames, as shown in Table 24, the participants showed their preference for the windows and streets formation of the new city, while the results were even regarding the ventilation systems of the two parts of Ghadames.

Table 24: Comparison of special identity elements between the old and new parts of Ghadames

Responses			I totally Agree	I partially Agree	I don't know	I partially Disagree	I totally Disagree
Window Openings	Old	N	15	25	15	5	29
		Percent	16.7	27.8	16.7	5.6	32.2
	New	N	49	27	5	3	6
		Percent	54.4	30.0	5.6	3.3	6.7
Ventilation	Old	N	53	13	9	6	9
		Percent	58.9	14.4	10.0	6.7	10.0
	New	N	29	38	2	5	16
		Percent	32.2	42.2	2.2	5.6	17.8
Streets	Old	N	18	23	4	12	33
		Percent	20.0	25.6	4.4	13.3	36.7
	New	N	76	9	3	0	2
		Percent	84.4	10.0	3.3	0.0	2.2

4.6 Research Discussion

In this section, the identity of Ghadames and its transformation are discussed in light with the targeted identity dimensions and the results of the study. Based on elements and indicators introduced in Tables 3, 4 and 6, the city of Ghadames is considered as a whole and compliance with these elements are examined. The researcher used three main scales to identify compliance with the elements of different identity dimensions; “Yes” indicates a major compliance, “No” indicates a lack of compliance, and “To a certain extent” indicates the weakening of the element.

4.6.1 Physical Identity

By applying the physical identity indicators into all parts of Ghadames settlement, Table 25, the city lost many of its physical identity due to the new development. The main issues are the homogeneity, spatial identity, link between elements, and seamlessness, which were diminished by introducing different concepts for urban morphology, houses and public areas.

Table 25: Compliance of the Ghadames, as one city, with physical identity indicators. Developed from Pazhuhan et al.(2015)

Physical Identity Indicator	Compliance	Evaluation and Discussion
Homogeneity between identity elements	No	Many physical elements that formed the original homogeneity in terms of manner, features and design purpose were not considered during the construction of the new part of the city. The two parts of the city act as separate entities in that perspective.
Buildup creating spatial identity	No	The physical identity components including urban morphology, public facilities and houses have are built based on different design concepts which affected the security, privacy and adaption to the environment for the city inhabitants. The spatial identity witnesses a noticeable change between the city parts.
The contrast of the identity elements while keeping unity	To a certain extent	The contrast that was clear in the old city has been kept in the new part, but not following the same concept as the old city, which creates an alien difference.
Link between identity	No	The identity elements of the new part are not well connected to the old part of the city.

Table 25: Compliance of the Ghadames, as one city, with physical identity indicators. Developed from Pazhuhan et al.(2015)

Physical Identity Indicator	Compliance	Evaluation and Discussion
elements forming one unit.		
Proportion suitability between structures and inhabitants	To a certain extent	The sizes in the new part of Ghadames are different that those of the old part. However, this change is driven by the need of the inhabitants for comfortable life. The old part sizes are now considered as unsuitable for the current needs of the inhabitants. The sizes, areas and dimensions of the old houses in Ghadames have equal proportions, which are suited to the compact design and the inhabitant's average size.
Seamlessness in development	No	The new part was built within few years. However, the new structures do not support a seamless development.
Privacy definition in identity elements	To a certain extent	The new development of Ghadames does not take into consideration the same privacy and security measures of the old part, which is reflected into the questionnaire results in the previous section. However, the design of the new houses relaxes the privacy requirements but introduces many features that support it.
Uniqueness of structures	To a certain extent	The new structures of Ghadames are minimally different from the other structures in the region. However, some aesthetic features adopted from the old part may draw the difference.

4.6.2 Environmental and Socio-Cultural Identity

The current environmental identity of the overall settlement of Ghadames was also weakened by the new development, which did not take into consideration any of the unique traits implemented by the old part of the city to support its environmental identity. Table 26 evaluates the environmental identity of Ghadames according to the environmental elements identified earlier in Chapters 2 and 3.

Table 26: Compliance of the Ghadames, as one city, with environmental identity elements. (Adopted from Figure 2.2 and Table 6)

Environmental Element	Compliance	Evaluation and Discussion
Geology	No	The new city is built beside the old city without any consideration to the geological nature.
Geography	To a certain extent	The location of the new development is solely dependent on the location of the old city.
Topography	No	Municipal Services are in the center of the city. However, industrial areas are located to the East of the new city. The formation of the new development is a block formation like many new cities in the world.
Climatic	To a certain extent	Mainly depend on modern systems for ventilation and water distribution, disregarding the old solutions.

In compliance with further environmental and socio-cultural identity elements identified by Butterworth (2000) and Uzzell, Pol, & Badenes (2002), Table 27 examines the city of Ghadames against the identity elements within these dimensions.

Table 27: Compliance of the Ghadames, as one city, with environmental and socio-cultural identity elements. Developed From Butterworth(2000) and Uzzell et al. (2002)

Socio-Cultural and Environmental Identity Element	Compliance	Evaluation and Discussion
Curiosity and confidence	To a certain extent	The city is still able to retain its population. However, it is clear from the performed questionnaire that the inhabitants' awareness of the several identity elements within their original development is reducing, which would drive their curiosity and confidence down by the time.
Community sensation	To a certain extent	The social ties between the city inhabitants still exists. Nonetheless, the questionnaire results indicate the social ties are lessened from its previous status, which is also caused and reflected in the physical identity of the city.
Physical events	Yes	The community is considered as a consolidated, yet open community. The main events that illustrated through weddings, which witnesses the illustration of the city's traditions.
Security	To a certain extent	The security element is closely related to the community sensation. Nevertheless, the results of the questionnaire indicate this element is diminished within the new community.
Privacy empowerment	To a certain extent	This aspect is weakened in the new development as none of the elements implemented in the old development were considered in the new development. However, the results of the questionnaire show weakening in this element, despite the different design considerations that are implemented within the houses of the new city.
Involvement and sense of self-importance	To a certain extent	Through the questionnaire results, it is evident that the inhabitants of Ghadames are less aware of their city's identity elements, which subsequently drives this element to lower levels.
The geographic limits of the place	No	The new development lacks identifying the city as an oasis, which is clear from the physical identity analysis performed in Chapter 3. The new development did not reflect the nature of the community.
The social solidity between the community members	To a certain extent	Privacy, security and unity sensation is weakened in the new development as shown by the results of the questionnaire.

Table 27: Compliance of the Ghadames, as one city, with environmental and socio-cultural identity elements. Developed From Butterworth(2000) and Uzzell et al. (2002)

Socio-Cultural and Environmental Identity Element	Compliance	Evaluation and Discussion
The satisfaction of the community collectively and individually	Yes	The overall satisfaction of the community is increased due to adopting an easier lifestyle than the one experienced in the old city. The comfort level increase is clear from the questionnaire results.

Finally, on an overall assessment of the compliance of the city of Ghadames with twenty-one identity elements, the city complied with two elements, lacked compliance with seven elements, and witnessed a weakened compliance with twelve elements. Therefore, it can be concluded that the urban identity of Ghadames is diminishing.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Identity in Ghadames

Based on the theoretical review of the identity concepts, dimensions and elements, and the performed case study of the settlement of Ghadames Libya, Table 28 provides a summary on the identity formed through the old city and its transformation through the new city. Moreover, the table compliments the results of the study with the analysis outcomes.

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
Physical Identity			
Homogeneity between identity elements	All physical identity features form continuation from one element to another in the same manner, features and design purpose.	Many physical elements that formed the original homogeneity in terms of manner, features and design purpose were not considered during the construction of the new part of the city.	The two parts of the city act as separate entities in that perspective.
Buildup creating spatial identity	The physical identity components from Urban morphology, public facilities, to the houses support the identity need of Ghadames for security, privacy and adaption to the environment.	The physical identity components including urban morphology, public facilities and houses are built based on different design concepts which affected the security, privacy and adaption to the environment for the city inhabitants.	The spatial identity witnesses a noticeable change between the city parts.

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
The contrast of the identity elements while keeping unity	There is a contrast between the way the houses represent the most private areas of the city, while the public spaces support the open trading activities of the city. This creates contrast, while preserving unity between all the elements.	The contrast that was clear in the old city has been kept in the new part, but not following the same concept as the old city	An alien difference between the old and new city, which cannot be classified contrast with unity.
Link between identity elements forming one unit.	There is a strong connection between each progressing identity element to another. As each element cannot serve the identity purpose without the other, this keeps them as one unit.	The new part of Ghadames forms its own identity elements.	The identity elements of the new part are not well connected to the old part of the city.
Proportion suitability between structures and inhabitants	The sizes, areas and dimensions of the old houses in Ghadames have equal proportions, which are suited to the compact design and the inhabitant's average size.	The sizes in the new part of Ghadames are different that those of the old part, which is driven by the need of the inhabitants for comfortable life.	The old part sizes are now considered as unsuitable for the current needs of the inhabitants. The sizes, areas and dimensions of the old houses in Ghadames have equal proportions, which are suited to the compact design and the inhabitant's average size.
Seamlessness in development	The old city does not show any differences between its parts at it was built over 100 years or more.	The new part was built within few years. However, the new structures do not support a seamless development.	The differences in the time periods that the two parts of the city were built over creates an apparent difference between them.

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
Privacy definition in identity elements	The inhabitants of old Ghadames clearly identified the purpose of the city designs, which mainly support privacy, security and environmental adaption.	The new development of Ghadames does not take into consideration the same privacy and security measures of the old part, which is reflected into the questionnaire results in the previous section. However, the design of the new houses relaxes the privacy requirements but introduces many features that support it.	Privacy is kept as a remaining important feature of the city to its inhabitant. The tools addressing privacy is what changed between the two parts.
Uniqueness of structures	Serving as a hub for trading activities, the elements forming the design of the city is inspired by many cultures including Amazigh, Sahara and Islamic, which makes the combination unique. Moreover, the adaption to the environment in an oasis and the specific uncopied structures.	The new structures of Ghadames are minimally different from the other structures in the region.	Some aesthetic features adopted from the old part were implemented in the new city. However, the house external and internal architectural elements of the new city do not show uniqueness, rather than typical constructed attached houses with traditional decorations.
Houses' Internal layout	The room sizes can reach as low as 1.4 m and the biggest room is the first floor living room with an average length and width of 4 m. Doors average size is 1.7 m x 0.8 m, while windows vary in size with average dimensions of 20 cm x 75 cm.	Room sizes and halls have a minimum of 2 meters, while the main rooms have an average size of 4 m x 5 m. Doors are 2.2 m x 1m for personal use, in addition to a vehicular entry. Windows have a unified size of 1 m x 1 m.	The internal layout of the homes has changed between the two parts, but mainly to serve the modern needs and comfort of the inhabitants, which are well valued by the people of the city including the old generation.

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
Houses' Structural elements	Internal and external walls have similar thicknesses that range between 40 to 60 cm and carry the weight of the house.	Concrete structure with the loads carried by ceilings, beams and columns to the foundation.	Given the change in time, there is a need to adopt structurally tested building material. Moreover, new houses have added features and architectural design that needs the adoption of different structural elements.
Houses' Building material	Foundations are made of volcanic stone. Walls are out of adobe bricks. Ceilings compose of palm trees wood, leaves and finished from the top with adobe.	Reinforced concrete for the structural elements. Hollow cement blocks for the walls. Waterproofing by liquid applied agents. Thermal insulation by polystyrene on top of the roof slab.	Similar to the structure modern material needed to be used in the new city. while identity in this element was not kept, except of the color or adobe, this element was changed based on the need of adaption.
Houses' Services	No water supply in toilets or rooms. Each house had a simple sewerage system of a sand filled sump pit. Natural lighting and ventilation through wall and roof openings, and reflective high wall mirrors.	Electric, water supply, sewerage and cooling and ventilation systems. Gas is provided through pressured gas bottles.	The services is one of the most affected elements between the two city part. This complete change emerged from the modern need for comfort of living, which prevented the preservation of the element.
Street Layout and paving	Narrow and compact design to support the ventilation and cooling system of the city, and to protect houses from the environment. The streets and alleys are made for pedestrian use and they are too narrow for vehicles.	Designed for vehicular use with pedestrian sidewalks. The streets are made of asphalt material and the sidewalks are made from artificial stone. Parking is available around houses, markets and municipal services' areas.	This physical identity element witnessed a complete change except for the aesthetic incorporation of covered pass ways between the houses in the new city, which does not serve the same purpose of their counterparts in the old city.

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
Green Areas	Oasis farms surrounding the city, which were used for agriculture and protection from desert wind. The old inhabitants of Ghadames used to use the farms for recreation and entertainment.	Manmade parks equipped playgrounds and few agricultural areas.	As the city do not rely on agriculture in the same degree of the old city, the focus in green areas is for entertainment and recreational purposes. Therefore, this element was completely transformed.
Public Areas and markets	The several squares at the conjunctions were used as marketplaces and event areas.	Dedicated buildings for markets distributed around the new city. Few facilities are available for weddings and events.	The markets are essential for the two parts of the city. However, the economic importance of the city diminished turning the market into a service element rather than and economic element
Interior concept	The colors are defined in the old city, which are taken from the culture of the old city inhabitants. Ornamentations were used on the door lintels using the red color as part of the interior concept. Decorations were essential parts of the house especially in the lowest floors and furniture use was simple, which depended mainly on the material available in the environment	Interior colors are to the personal preference in the new city and there is no real presence of cultural ornamentations as they were used before. Moreover, furniture used is modern for more comfort.	This element has diminished in the new city in comparison to the well-defined interior concept of the old city.
Environmental Identity			

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
Geology	An oasis built around a water spring. Agriculture is suitable to the geology of the city.	The new city is built beside the old city without any consideration to the geological nature.	The new city is built beside the old city without any consideration to the geological nature.
Geography	Located on a cross road between the desert and the coastline to support the trading activities of the city.	Located at the southern edge of the old city to facilitate access to the old city.	The location of the new development is solely dependent on the location of the old city.
Topography	A nucleus formation from the inside out to ease living of the city residents and empower privacy and security.	Municipal Services are in the center of the city. However, industrial areas are located to the East of the new city.	Municipal Services are in the center of the city. However, industrial areas are located to the East of the new city. The formation of the new development is a block formation like many new cities in the world.
Climatic	Several considerations for ventilation and water distribution to support the oasis nature of the city.	Mainly depend on modern systems for ventilation and water distribution, disregarding the old solutions.	Mainly depend on modern systems for ventilation and water distribution, disregarding the old solutions.
Socio-Cultural Identity			

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
Curiosity and confidence	As it could retain its economy and population until the beginning of the 20 th century and unavailability of surveys that provides the residents' opinions, the old city can be considered successful in this element. However, the status of this element should be evaluated in this research.	The new city's inhabitants lack deep awareness of the identity of their city as well as their original identity. The ease of movement to other parts of the country and the availability of more interests outside the city drives the inhabitants away from the new city of Ghadames.	The city is still able to retain its population. However, it is clear from the performed questionnaire that the inhabitants' awareness of the several identity elements within their original development is reducing, which would drive their curiosity and confidence down by the time.
Community sensation	The closeness of the physical elements of the city indicates strong community sensation. However, the status of this element will be further evaluated during this thesis.	The social ties between the city inhabitants still exists. Nonetheless, the questionnaire results indicate the social ties are lessened from its previous status.	The nature of the houses in the new city in terms of distances reflects the diminishing of the community sensation as it was before in the old city.
Physical events	The community is considered as a consolidated, yet open community. The main events that illustrated through weddings, which witnesses the illustration of the city's traditions.	Social and physical events are still held in the new city including a festival celebrating the culture.	This element still exists as part of the city's identity.
Security	The old city neighborhood formation empowered security in the old town. However, the security in the new part will be further evaluated in this study.	The security element is closely related to the community sensation. Nevertheless, the results of the questionnaire indicate this element is diminished within the new community.	The participants of the study confirmed that there is still a certain sense of security, while there is a less confidence in this element in the new city, and a preservation for it in the old city.

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
Privacy empowerment	This aspect is clear in the old city as a stringent requirement of the culture of the city. The increase of the privacy is apparent from the public spaces to the houses in the city. Privacy of the new development will be evaluated in this study.	This aspect is weakened in the new development as none of the elements implemented in the old development were considered in the new development.	The results of the questionnaire show weakening in this element, despite the different design considerations that are implemented within the houses of the new city.
Involvement and sense of self-importance	This element cannot be evaluated for the old city, as it requires the opinion of the ancient inhabitants.	Awareness of the importance of the new city have lessened. Hence, affecting the involvement of the people in building the identity of their city.	Through the questionnaire results, it is evident that the inhabitants of Ghadames are less aware of their city's identity elements, which subsequently drives this element to lower levels.
The geographic limits of the place	The geographic limits are identified and environment is identified as a desert oasis. The old city is designed to fit this identity. However, the new city will be further evaluated in this research.	The new development lacks identifying the city as an oasis, which is clear from the physical identity analysis performed in Chapter 3. The new development did not reflect the nature of the community.	The study results show the direction of modernization of the city, taking it away from the oasis identity.

Table 28: Summary of identity elements comparison between the old and new parts of Ghadames

Identity Elements	Old City	New City	Analysis Result & People's Opinion
The social solidarity between the community members	The physical aspects reflect the closeness of the old city residents through the compact cluster design. Nevertheless, this element will be evaluated further for the new development.	Privacy, security and unity sensation is weakened in the new development as shown by the results of the questionnaire.	The survey results show the weakening of this element between the parts of the city. This element is relative, as we compare the strong solidarity of the inhabitants in the old city with the current situation in the new city.
The satisfaction of the community collectively and individually	This element cannot be evaluated for the old city, as it requires the opinion of the ancient inhabitants.	Easier lifestyle elements have contributed in increasing the satisfaction of the overall community, including senior members.	The overall satisfaction of the community is increased due to adopting an easier lifestyle than the one experienced in the old city. The comfort level increase is clear from the questionnaire results.
Economic Identity			
Income, production and professions (Tavakoli, 2010)	The income of the old city was mainly from trading activities and agriculture, which defined the professions of the city inhabitants. The production was mainly for items brought re-exported from the African depth or the coast of Northern Africa.	The new city's income currently is from governmental funds, tourism and minimal agricultural activities. Therefore, the production of the city has reduced and took a different nature.	This identity dimension has completely changed between the two parts of the city. Although this element was not studied thoroughly in this thesis due to the lack of economic information, the researcher can draw this conclusion based on her own experience and the theoretical elements studied in the literature.

Following the previously reviewed study results, it is evident that the identity is formed through several elements. Furthermore, the evaluation of the identity is

performed through understanding these elements in the original settlement or city, and reflecting those elements on the new development, which allows the researcher to understand the concept and its transformation. Moreover, this study adopted a questionnaire methodology by involving the inhabitants of the case study in the evaluation of the identity, which gathers the analysis and perception approaches in the identity study.

Subsequently, the method is applied to the city of Ghadames and its two parts, which were developed in completely different eras. This fact might be one of the most influential factors that resulted into the diminishing of most of the identity elements between the two parts, as the city development lacked the gradualism that is needed for a seamlessly built environment. The sudden change between the two parts resulted into a dramatic change to the inhabitants' and the city's identity, which created a new identity for them, rather than being a continuation from the original identity.

5.2 Conclusions on the Identity and its Evaluation in Ghadames

Following a comprehensive study of the urban identity, its dimensions and elements, the concluding remarks of this research are aimed to summarize the outcomes of the study in its theoretical and field assessment parts. Four identity dimensions were identified as:

1. Physical identity.
2. Environmental identity.
3. Socio-cultural identity.
4. Economic identity.

Each of the abovementioned dimensions consist of several elements that were examined against the case study of Ghadames. In the theoretical study of this research, it was found that the old city in Ghadames have established a unique physical, environmental and socio-cultural identity to suite its inhabitants and the surrounding environment.

The physical identity of Ghadames is apparent through the following:

- a) An urban morphology that is centered around water resources and surrounded by thick palm trees agricultural areas, which played a major role in providing food and building material resources for the settlement, as well as protecting the city from harsh weather conditions.
- b) A public areas and streets formation that supported the cultural need for security and privacy through narrowing streets and alleys. The service systems of the city utilized natural sources into providing lighting, ventilation, cooling and water through ceiling and wall openings, and a smart water distribution system.
- c) A unique compact housing design that empowered the privacy, security and community sensation for its residents.
- d) The interior identity which consist of colored ornamentation, handmade fabric and unique space configuration.

Moreover, the physical identity of the old city was built to establish its environmental and socio-cultural identity. The curiosity and confidence of its original inhabitants drove the city to grow to its current population and position it at the Sahara-Northern coast commercial cross road. The solidarity of the old Ghadames' community is illustrated through the closeness of its structures, which empowered the privacy and security of the old community. The physical elements were built to empower the privacy, security and social closeness between the inhabitants, which brought self-confidence into the old city inhabitants.

On examining the continuation and transformation of the identity through the new part of the city through theoretical and a questionnaire, which was distributed in the current inhabitants of the city, it was found that the majority of the identity dimensions and their elements were affected by establishing the new development of Ghadames. The overall identity of the city has changed overtime and the awareness of the inhabitants of the traits that made their settlement unique has diminished.

Moreover, the physical identity has changed through the new development by constructing houses that has minimal appearance traits from the old city. The people of Ghadames have moved from using a courtyard for ventilation and lighting, and a smart water distribution system for water supply and cooling, to using electrical and mechanical systems to satisfy their needs. The old Ghadames have adopted a passive climate control as part of its identity, which gives it the sustainability character that is currently not available in the new city. As analyzed and discussed from the survey results, many environmental and socio-cultural identity elements have been affected by this transformation. The participants indicated that essential identity elements such as privacy, security and social cohesion have been negatively affected.

In conclusion, the study examined twenty-one identity elements within three dimensions, where it was found that the city has lost seven of these elements over time and another twelve elements are weakening as the new city is developed and the old city has been abandoned as a residence.

5.3 Recommendations

To utilize the outcomes of this study, the researcher would like to provide a set of recommendations to the inhabitants and the cultural and development authorities in the city in order to support sustaining and enhancing the identity of the city, as follows:

1. Empower the tie of the physical identity of the new development with the original identity of the old city by enhancing the external appearance of the new development to match the old city's.
2. Establish an awareness program to educate the people of Ghadames about their city's original identity, which could open the way for more development and identity empowerment initiatives.
3. Enhance the public areas appearance and functionality to host events that remind the people of the city of their city's identity.
4. A project should be established to increase the green areas around the new development using palm trees to sustain the oasis identity of the city.

5. Enhancements can be made on the alleys between the houses in the new city to match the features implemented in the old city such as seating areas and more curvature.
6. Perform refurbishment works on the interior of the houses in the old city and provide modern services that could encourage the city inhabitants to move back to their homes. This could help making the old city alive again rather than being a touristic destination.
7. Initiate regular markets and events on a weekly and monthly basis that are hosted in the squares of the old city.
8. Provide more media exposure for the city through public relations in order to promote the city's culture, heritage and identity.
9. Enhance the water distribution system in the new development by designing and constructing a system that matches the water system of the old city.
10. Encourage the young generation of Ghadames to spend more time in the old city in order to increase their familiarity with their identity and be able to develop it and support it.
11. The economic dimension of the identity in Ghadames was not explored in detail within this research. However, from the read through the literature, it is clear that the city's character of being a crossroad connection between the African depth and the Northern African coast have been diminished. The current economic activities of the city are mainly focused on tourism and agriculture. Therefore, the economic identity could be explored in future research in further details.

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APPENDIX 1

(Questionnaire Template)

A Questionnaire about the Life in Ghadames

This study aims to understand the transfer of identity of old settlement Ghadames into new housing environment. Study is part of the master's study made in Cankaya University.

Please answer the following questions based on your personal thoughts and experience. We sincerely appreciate your participation.

A. Demographics	
1. Gender:	<input type="checkbox"/> Male <input type="checkbox"/> Female
2. Age category:	Below 18 <input type="checkbox"/> 18 to 30 <input type="checkbox"/> 31 to 45 <input type="checkbox"/> 46 to 60 <input type="checkbox"/> Above 60 <input type="checkbox"/>

B. The Inhabitant and the city					
3. Which part of the city do you generally prefer living in?	a. Old City				
	b. New City				
	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
4. Do you think the old and new buildings of Ghadames complete each other?					
5. Do you think that the					

exterior design of the two parts of the city look similar?					
6. Where do you spend most of your time in Ghadames?	a. Old City				
	b. New City				
7. Why do you spend most of the time in that area? (you can choose more than one option)	a. I like the design and facilities of that area.				
	b. I feel more comfortable spending my time in that area.				
	c. There are many things I need/ want that are only available in that area.				
	d. I work in that area.				
e. explain more					

Old City					
8. Have you ever lived in Ghadames old city? <input type="checkbox"/> Yes <input type="checkbox"/> No					
9. Except you, who of your related people have lived in the old city (Choose all applicable)?					
<input type="checkbox"/> Brothers or sisters. <input type="checkbox"/> Cousins or friends. <input type="checkbox"/> Parents. <input type="checkbox"/> Grandparents. <input type="checkbox"/> Uncles and aunts. <input type="checkbox"/> No one					
10. What is the most important character of the old city?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
a. The privacy of the home.					
b. The social life.					
c. The public spaces (Streets, alleys, markets, gardens, etc.)					
d. The security.					
e. The internal space use at home.					
f. The interior decoration.					
11. Do the old houses in Ghadamessatisfy the current needs of its people in the desert environment? (Cooling, heating, water supply, electricity, sewerage, etc.)?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree

a. The way it was originally designed satisfies the current needs.					
b. It satisfies the needs after adding the modern services to the house.					
c. The old houses lack necessary services always.					
12. The inner spaces of the old houses fulfill the current needs of its inhabitants.	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
13. Is the system used of the water distribution in the old city is suitable for the current situation of the city?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree

New City					
<p>14. Who of your related people lives in the new city (Choose all applicable)?</p> <p> <input type="checkbox"/> Brothers or sisters. <input type="checkbox"/> Cousins or friends. <input type="checkbox"/> Parents. <input type="checkbox"/> Grandparents. <input type="checkbox"/> Uncles and aunts. <input type="checkbox"/> No one </p>					
15. Does the new city makes you feel that you are still tied to the old city?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
16. What is your favorite character of the new city?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
a. The comfort of the house.					
b. The modern life while I am still close to my family.					
c. The public spaces and facilities.					
d. The appearance of the new city.					
e. The internal spaces at home.					

f. Other (Please Explain)				
17. Is the current system of water distribution in the new city enough for the life there?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree

E.City Parts Comparison					
Which part of the city do you think is more secure?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
18. Old City					
19. New City					
Which part of the city do you think is easy for living?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
20. Old City					
21. New City					
Which part of the city do you think has a better social life?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
22. Old City					
23. New City					
Which part of the city do you believe Has a more beautiful appearance?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
24. Old City					
25. New City					
Which part of the city do you think has a better privacy?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
26. Old City					
27. New City					
28. Which house or public facilities do you prefer better?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree

	Agree	Agree		Disagree	
a. The courtyard of the old houses					
b. The small balcony of the new houses.					
c. The big balcony of the new houses.					
d. Common outdoor facilities for housing residents.					
e. If there is indoor facilities for residents of apartments. (Type A: Meeting/ party room with kitchens and bathrooms)					
f. If there is indoor facilities for residents of apartments. (Type B: Sports facilities allocated for residents applying gender separation by hours)					
Which window design do you prefer more?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
29. The small window openings used in the old houses.					
30. The big window openings used in the new houses.					
Which ventilation system quite good or healthy do you prefer?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
31. The ceiling ventilation opening (Natural) in old houses.					
32. The modern ventilation technology (air conditioning) used in new houses.					

Which streets do you prefer to use ?	I totally Agree	I partially Agree	I don't Know	I Partially Disagree	I totally Disagree
33. The narrow alleys of the old city.					
34. The wide streets of the new city.					

THANK YOU FOR YOUR TIME

