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**Towards an Integrated
Neo-Vernacular Built Environment**

by Nahla Nabih M. Makhlouf

2013



Ain Shams University
Egypt



University of Stuttgart
Germany

Towards an Integrated Neo-Vernacular Built Environment

*Design guidelines for the living environments inspired by
socio-cultural and environmental aspects*

Qârat Um-Aşaghier Village, The Western Desert of Egypt

**A Thesis submitted in the Partial Fulfilment for the Requirement of the Degree
of Master of Science in Integrated Urbanism and Sustainable Design**

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The Western Desert of Egypt

DISCLAIMER

This dissertation is submitted to Ain Shams University, Faculty of Engineering and University of Stuttgart, Faculty of Architecture and Urban Planning for the degree of Integrated Urbanism and Sustainable Design. The work included in this thesis was carried out by the author in the Year 2013

The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

20/07/2013

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Signature

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THESIS ABSTRACT

Demands of the remote desert and less developed communities have become challenging by the rapid industrialization and aspired expressions of modern living. The indigenous ethnic groups of those areas developed their unique way of living that fulfils their lifestyle needs, however, for those communities, manifestations of the urban invasion are affecting this inherited uniqueness. The vernacular architecture of those communities expresses accumulative attempts of acclimating the living environments to their needs.

This master's research is based on a case study methodology applied in *Qārrat 'Um-Āṣaḡīr Village*. It discusses an integrated neo-vernacular approach for the current developments in the distinctive remote desert areas. The integration between advanced high- and traditional low-techniques as an approach to achieve the contemporary needs of its segregated community is one of the research's significant results. The study is conducted to outline the responses towards the contemporary socio-cultural and environmental needs, by tracing the architectural development of the housing typologies. This study is based on an analysis for the culture, traditions, and lifestyle of the villagers, in addition to analysing the hierarchical urban configuration of the case study village. The research is based on a fieldwork survey conducted in *Qārrat 'Um-Āṣaḡīr Village*. Participant-observation, direct and guided observations, in addition to community meetings and interviews with the villagers and the different governmental entities, had been its pillars.

Based on analysing the criteria affecting the design and construction of the different living environments, a set of design guidelines is developed. These guidelines contribute in improving the future developments and in providing an integrated contemporary neo-vernacular living environment in remote desert areas.

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LIST OF TRANSLITRATIONS*

<i>ʿAgūrmī</i>	A village in Siwa Oasis has its own <i>Old Šālī</i> .
<i>Al-Ġārah</i>	The name of the case study village as <i>The Villagers</i> call it in their local tongue.
<i>Al-Hamūdāt</i>	Name of The Village’s original tribe.
<i>Al-Qārra</i>	The higher hilly land
<i>Šālī</i>	The old town in the Barbarian tongue.
<i>Šīḥ</i>	The head of the tribe.
<i>Šīš</i>	A traditional wooden frame opening found in many places all over Egypt. However, it is an imported feature in <i>The Village</i> .
<i>Šqqah</i>	Literally means an apartment. The villagers use it to refer to the new suite; consists of a master bedroom and a toilet.
<i>ʿAyn Kifārā</i>	A region surrounding <i>The Village</i> to the North.
<i>Biʿr Al-nuṣṣ</i>	Name of the halfway point on the road to <i>Qārrat ʿUm-Āṣaġīr Village</i> .
<i>Ġabal ʿAfyā</i>	A region surrounding <i>The Village</i> to the North.
<i>Hūr</i>	The traditional dry toilet room.
<i>ʿIšrāḥ</i>	The traditional wedding dress.
<i>ʿIṣṭāḥ-ntābint</i>	The traditional stove room.
<i>Kānūn</i>	A second equipment found in <i>ʿIṣṭāḥ-ntābint</i> . Used along with the traditional stove. It is a heating corner usually fired with firewood
<i>Karšīf</i>	The contextual salty-rock deposits of the oasis. It is used mainly to construct the vernacular mud-brick buildings in whole Siwa province including <i>The Village</i> .
<i>klīm</i>	The traditional handmade carpets

<i>Maqām</i>	Mausoleum in Arabic.
<i>Marbū‘ah</i>	The traditional space where <i>The Villagers</i> receive male or foreigner guests.
<i>Marsā-Maṭrūh</i>	Also called <i>Maṭrūh</i> . The administrative province which <i>The Village</i> belongs to.
<i>Maṭlūl</i>	The living space in the house.
<i>‘Amāzīgī</i>	The Arabic title giving to the both the Barbarian language and Barbarian man.
<i>Miṣṭāh</i>	The traditional space where <i>The Villagers</i> used to dry their harvested dates.
<i>Mūlid Al-Šiyḥ Yağā</i>	The most famous local festival in <i>The Village</i> .
<i>Mūriḥ</i>	The internal courtyard of the house.
<i>Qārrat ‘Um-Āṣağīr</i>	The name of the case study village.
<i>Qaryit ‘Allām</i>	The common given name for the first thirty governmental provided units.
<i>Qiṣiyah</i>	The base wall <i>The Villagers</i> build in their present development.
<i>Qūr Allaban</i>	A region surrounding <i>The Village</i> to the North.
<i>Āṣfā</i>	Type of wooden window frames.
<i>Tabağbağ</i>	A region surrounding <i>The Village</i> to the North.
<i>Tarfūṭit</i>	The traditional women custom worn outdoors.
<i>Ṭflah (Tlaḥt)</i>	The contextual salty mud found as the surface layer above <i>Karšīf</i> in the area close to <i>Qārrat ‘Um-Āṣağīr Oasis</i> .
<i>Turyyā</i>	A satellite based telephone known for its expensive call rates.

* Based on DIN 31635 (1982), according to an online source: http://transliteration.eki.ee/pdf/Arabic_2.2.pdf [Accessed: 23.06.2013]

LIST OF ABBREVIATIONS

<i>DDA</i>	Desert Development Authority
<i>DHU</i>	Directorate of Housing and Utilities
<i>EGP</i>	Egyptian Pounds
<i>EMA</i>	Egyptian Meteorological Authority
<i>EQI</i>	Environment-Quality International
<i>IDSC</i>	Information and Decision Support Centre
<i>IUSD</i>	Integrated Urbanism and Sustainable Design
<i>LAU</i>	Local Administrative Unit
<i>NREA</i>	New and Renewable Energy Authority
<i>NWCDA</i>	North-West Coast Development Authority
<i>PV</i>	Photovoltaic

CHAPTER ONE



RESEARCH BACKGROUND AND INTRODUCTION

1. RESEARCH BACKGROUND AND INTRODUCTION

In the remote indigenous areas in Egypt, the unique vernacular architectural character is threatened by the blind usage of the industrialized building materials. Yet, the built environment is a main contributor to achieve the sustainable development, while the worldwide scope of experts and researchers are being directed towards it. Distinctive desert settlements are being endangered by the modern urban invasion of the current industrialized developments; especially in the housing sector. People are seeking the change. Indigenous people who exist nowadays are different than those who developed the unique indigenous character of their settlements hundreds of years ago, however being their descendants. Thus, indigence for a compromised neo-vernacular approach for the current developments in those distinctive areas is important. In an attempt to save its distinction and to provide its indigenous community with their present desires. Several architectural development challenges currently exist in many of those distinctive areas; which are distinguished by their unique vernacular architectures. Several manifestations of urban invasion started to take place in those areas. In addition to, the governmental housing projects which have been taking place ignoring to the local's socio-cultural, environmental and contextual needs.

One such remote village in the Western Desert of Egypt stands out with its unique indigenoussness, culture, history, ethnic racial group of people and their social structure, in addition to its contextual, climatic and environmental distinction. Qārrat □Um-Ā□agīr is yet a virgin study area in the province of Siwa Oasis. Since *The Village* is remote and isolated, research on it is very limited in the fields of architecture, urbanism, and social sciences. In *The Village*, the old vernacular architecture and the new architectural developments are juxtaposed. It is an interesting case to be studied and understood because of its remoteness, distinguished identity and harsh weather conditions. These make the transformations from the vernacular architecture to the present developments are easily recognizable. It is a small village, if not the smallest in Egypt, of around 512 inhabitants (IDSC 2012) within a limited area. This makes it competent to be

studied within the limited timeframe allocated for this study.

Furthermore, it is one of the first two remote villages in Egypt that has been provided by the domestic photovoltaic systems. Therefore, *The Village* is wrestling between the existence of the vernacular low-building-techniques and the emergence of the highly-advanced industrialized system of power provision.

1.1. THE RESEARCH PROBLEM

Yet, the architectural developments in *The Village* are taking many shapes. Gaps in the different living environments that exist in *The Village* are evident fig._1.01. Since the traditional building techniques are facing technical and economical challenges which affect its sustainability. The traditional vernacular houses in *The Village* are being abandoned, replaced by modern ones or left to be deteriorated. The present self-led houses and the governmental provided housing prototypes are erasing the inherited indigenous vernacular living environment. The recent self-led housing developments are ignoring part of the

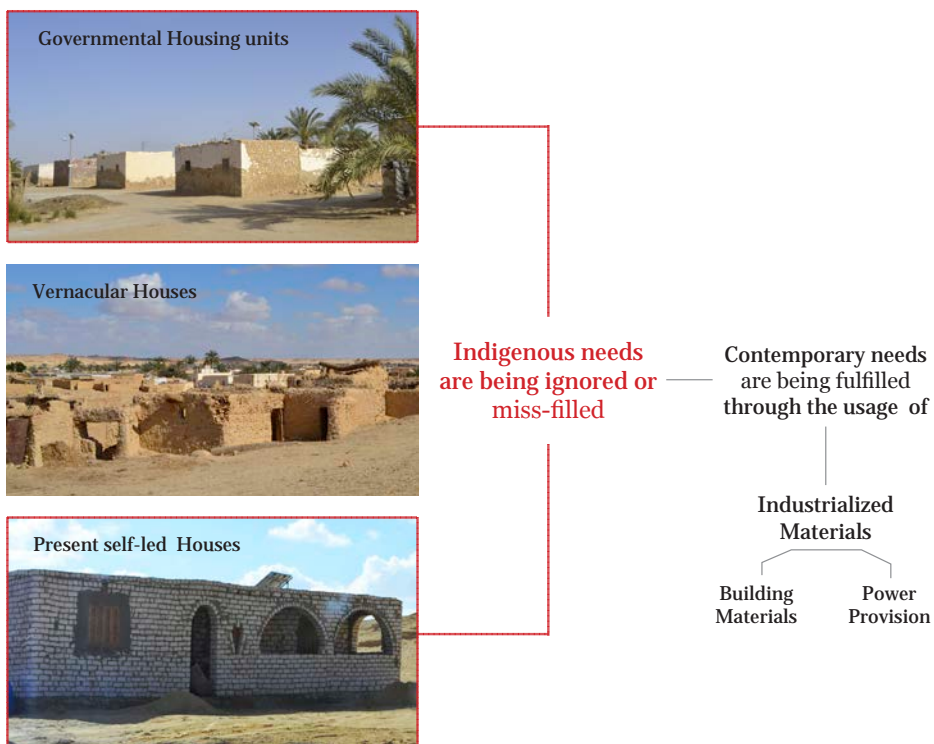


Figure 1.01 Illustration for the conducted problem statement

environmental considerations by the blind usage of the industrialized building materials fig._1.01. In addition, the governmental housing prototypes ignore other socio-cultural aspects inherited with the indigenous villagers' lifestyle. Adapting the socio-cultural, environmental and contextual needs of its inhabitants are taking many shapes in the different living environments. As observed contemporary needs of the villagers are being adapted in their homes by means of using the industrialized materials. Moreover, the governmental efforts for the architectural development of *The Village* underestimate the comprehensive vision for a good fit between socio-cultural needs and the inherited distinction of its built environment.

1.2. RESEARCH OBJECTIVES

The research aims at developing a set of design guidelines which contributes to define an approach for integrated neo-vernacular living environment in *Qārrat 'Um-Āṣaḡīr*, fig_1.02. This set of guidelines is inspired by the socio-cultural and the environmental aspects in *The Village*. Consequently, being able to:

- Understand the different living environments in *The Village*.
- Highlight the architectural distinction in one of the isolated and limitedly researched villages in the Western Desert of Egypt, hence, as a source of documentation.
- Explore an integrated neo-vernacular approach to amalgamate social, cultural and environmental needs, to achieve a contemporary and compatible living environment.
- Contribute in improving the governmental housing prototypes in remote desert areas.
- Study the applicability of integrating low- and high-techniques in a distinctive remote desert village.
- Apply a bottom-up discussion approach, with the villagers, in order to develop a compromised, integrated and attuned living environment.

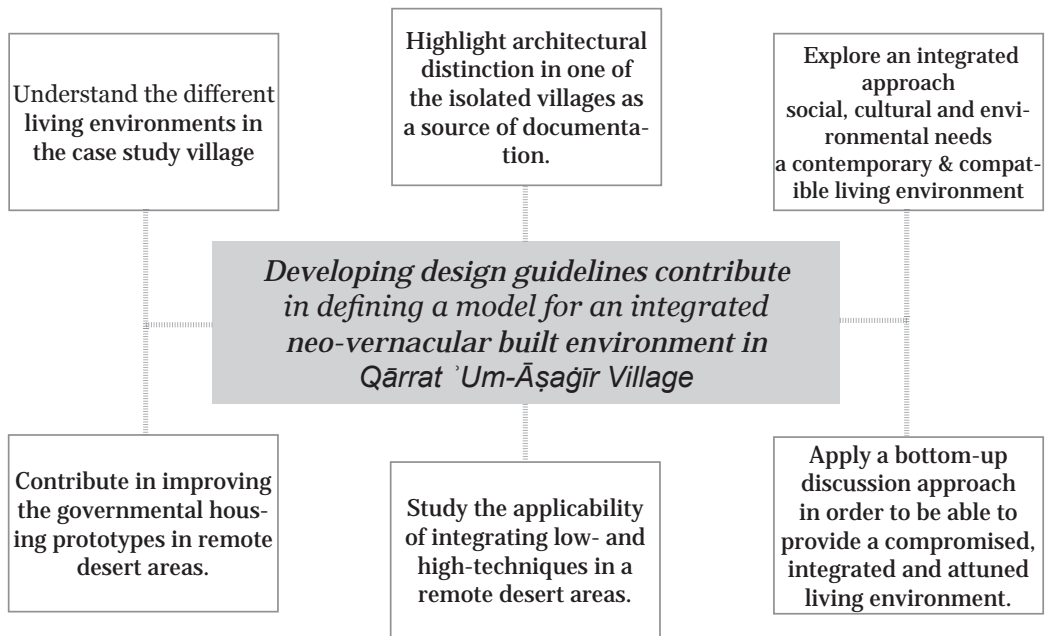


Figure 1.02 A Diagram for the research main objective and its subsequent ones

1.3. RESEARCH SCOPE

The research studies the different living environments in *The Village*, since it shapes the largest part of the built environment. The discussion and analysis of these living environments include the phases of development, and the several sets of criteria affecting their design and construction. The study is mainly focusing on the socio-cultural and environmental aspects rather than the construction ones; in terms of the house morphology, the spatial internal configuration, building materials and the usage of Photovoltaics (PV) panels for the power provision.

Other aspects related to the architectural appearance of the houses, or the urban scale of the residential settlement, will not be considered in this research.

1.4. RESEARCH QUESTIONS AND HYPOTHESIS

1. *What are the inherited bases of the unique indigenous living environments in The Village?*
2. *How to incorporate the social, cultural, and environmental indigenous needs/bases into an integrated and compatible neo-vernacular living environment?*

Answering the first question reveals the bases of the different living environments in *The Village* in relation to the indigenous lifestyle, culture, and traditions of the villagers. The second question is an attempt to analyze these different living environments in terms of those bases, in order to develop integrated guidelines for a neo-vernacular living environment. That understands and learns from the past indigenous attempts, and the present self-led and governmental-led initiatives, and builds upon.

One can achieve a neo-vernacular approach for the living environment; by integrating both contextual low-techniques and advanced industrialized techniques, in competence, in the remote isolated areas. Hence, to provide the contemporary needs of its communities, along with respecting their socio-cultural inherited requirements.

1.5. THE THESIS METHODOLOGY AND CONTENTS

The research applied the case study methodology on *Qārrat 'Um-Āṣaḡīr Village* to answer the previous research questions. Since resources are limited, the research was mostly confined by the fieldwork in its different forms and phases. Starting from the preliminary investigation visits, till the intensive fieldwork phase which is the most important part applied through a participant observation method.

The thesis presents the steps and findings of the study in seven chapters. The findings of each chapter are the basis of the analysis and information presented in the subsequent one. After the introductory chapter one which explains the research background, the literature studied during the different phases of the research is summarized and reflected upon in chapter two. Then a detailed elaboration on the research methodology, and methods applied during the fieldwork is explained in chapter three. Thereafter, the thesis main body starts with a background on *The Village* in chapter four. Chapter five presents a timeline of the development interventions executed in *The Village* during the past four decades. It ends with a classification of the typologies of the living environments. Chapter six analyses those typologies from the morphological, socio-cultural

and environmental perspectives. Through this analysis the transformation of the different building materials from the traditional to the industrialized ones is revealed. Chapter seven discusses developing the guidelines for the spatial organization of the house, and the proposals for the house environmental adaptation to the context.

1.6. RESEARCH LIMITATIONS AND SITE CONSTRAINTS

Conducting the research fieldwork faced several limitations:

- The required Military Intelligence permissions for entering *The Village* and the limited allowance for the nights spent for the non-villagers, in addition to the nonexistence of hotels or guest-houses, have limited the fieldwork period. This affected the number of the villagers interviewed and the level of the details of the data gathered.
- The remoteness, isolation and non-properly sealed road to *The Village* have limited the ability of conducting recurrent site-visits. Thus, *The Village* fieldwork has been limited to two site-visits; one of a half-day investigation and the other core two full-days and nights of participant-observation, guided observations and interviews.
- The community's adherence to the gender segregation mores confined the researcher most of the time to the women's zones, whose Arabic tongues were not very good. This directed the participant observation to interesting approaches; by they being informants in their actions and behaviour patterns at home spaces.
- The misunderstanding of the researcher's role by the female villagers, as a result of the less exposed society.
- The limited resources of literature or previous researches conducted on the same village caused, somehow, a blind investigation process at the fieldwork. However, the researcher assured the genuineness of the presented information by asking more than one informant.

1.7. COMMENTS ON THE INFORMATION AND DATA PRESENTED

The fieldwork research has been the imperative source of information and data presented in this thesis. All the data presented and analysed are based on the observations and interviews in the different methods explained in chapter three. Thus, all photos were captured by the researcher and her escort. Sketches have been developed by the researcher. Other physical artefacts have been either collected or practiced by the researcher (like practicing handcrafts). Unless otherwise indicated.

CHAPTER TWO



LITERATURE BACKGROUND AND DEFINITIONS

2. LITERATURE BACKGROUND AND DEFINITIONS

2.1. VERNACULAR ARCHITECTURE: A LITERATURE BACKGROUND

Different resources mentioned about the homogeneous collaboration of the vernacular architecture in desert areas shaping the desert landscaping (Dabaieh 2011). However, many others studied its socio-cultural adaptation within its context and the climatic comfort it provides by means of utilizing the contextual available materials.

2.1.1. THE VERNACULAR ARCHITECTURE

Paul Oliver (1987) studied vernacular architecture trying to understand its meaning and manifestations within the different cultures. In his book *Dwellings: The house across the world* he referred to the lack of the field of research that combines anthropological studies and the study of dwellings. Furthermore, in *Built to Meet Needs* (2006) defining the meaning of vernacular architecture was his priority. Oliver referred to it as the buildings of and by the people. He discussed the diversity of the cultures of people and places which is reflected in turn upon the diversity of the vernacular traditions in buildings. He implicitly deduced that its sustainability is conditioned by its inherited traditions if they are meaningful. Adding that cultures, have overtime, determined the architecture that satisfied their needs, including psycho-social and physical needs. Yet, Dabaieh (2011) added that the vernacular buildings know-how is the mix of culture, social inheritance, traditions and environmental adaptation.

John May (2010) referred to the vernacular architecture as the type of architecture that has used local tools and materials to adapt them to the local climatic conditions, ecology and geology (cited in Dabaieh 2011)

However, the definition that Dabaieh (2011) mentioned is the most relevant to this research. Accordingly, it is deduced that vernacular architecture is concerned with both the socio-cultural needs of its communities, in addition to the utilization of the local materials to their environmental constraints. Thus, studying these both factors is intended in this research, since, the Western Desert is

mentioned to be rich of its various traditional building methods in its different oases. These vary between mud brick architecture, Fig._2.01, and *Karšif* vernacular (contextual salty stones) in Siwa Oasis, Fig._2.02.

2.1.2. ADAPTING SOCIO-CULTURAL NEEDS IN DWELLINGS

Dikmen (2010) studied the socio-cultural aspect of the reconstruction of the post-disaster houses. He referred that the house is the place where the basic and the most complicated needs of human beings are being satisfied. He cited Rapoport's words "*Because building a house is a cultural phenomenon, its form and organization is greatly influenced by the cultural milieu to which it belongs.*" (Dikmen 2010: 193). Thus, he referred to the 'soft' aspects, such as; the traditions and cultures, and the 'hard' ones like the physiological requirements. In which, he asserted on them as the most important factors that shape settlements.

The mutual interrelationship between people and their surrounding built environment was discussed as a socio-cultural aspect by Amos Rapoport (1976). He introduced a set of questions according to eight different categories, which by answering, this relationship is revealed. These questions included studying; the characteristics of people which affect the shape of their built environment, the effect of the built environment on human behaviour, the house form along with a description of the space



Figure 2.01: *Mud brick houses in Balat village, Dakhla Oasis (Dabaieh 2011: 124)*



Figure 2.02: *Skyline of the Karšif vernacular houses in Siwa Oasis.*

organization, and the effect of cultural change on the environment; e.g. If it is limited to the substitution of modern materials for the traditional ones, or it also affects ways of organising spaces in homes (Rapoport 1976). Therefore, most of the socio-cultural analysis included in the thesis tried to answer these questions; either implicitly or explicitly.

2.1.3. CLIMATIC AND ENVIRONMENTAL ADAPTATION:

Desert vernacular know-how has been evolved based on a deep awareness and understanding of the harsh climatic conditions, in addition to the talent of its communities to utilize the available resources to adapt their needs. Dabaieh (2011) studied the desert vernacular architecture and argued, as many other researchers, that earth is a distinguished building material used in the desert hot-arid climates; due to its high heat-retaining capacity. It is usually built in thick walls, consequently provides a better thermal comfort in the indoor environment during both summer and winter. Vernacular dwellings in the Western Desert of Egypt perform environmentally in competence with surrounding climates. Adapting different passive means to prevent heat gain, maximise heat loss and control the excess heat through passive techniques have been its main significance.

Givoni studied design principles for a better thermal performance of buildings referring to the hot-arid climates. He defined the thermal zone that provides thermal comfort as “*the range of climatic conditions within which the majority of persons would not feel thermal discomfort, either of heat or of cold.*” (Givoni 1992). However, people living in the harsh climatic conditions are able to tolerate higher temperatures according to the natural acclimatization phenomenon (Givoni 1991, Givoni 1992). Consequently, the proposed design principles included studies of; the building layout, rooms’ orientation, window size and orientation, the usage of shading devices, design of the building envelope, and vegetation near the building (Givoni 1994). Part of these principles has been included in the analysis of the living environments in this thesis.

2.2. TERMS AND DEFINITION

A) Neo-vernacular living environment

The expression *living environment* in this research refers to the dwelling as part of the built environment. Oliver (1987) has defined dwelling as the process of living and its physical expression. Thus, *living environment* is a set of activities and structures. Explaining the term neo-vernacular living environment requires definitions of neo and vernacular for a precise elaboration on its usage in this thesis. In an English-English dictionary *neo* is mentioned to be “*used at the beginning of a word to talk about current styles, beliefs etc that are similar to ones that existed in the past.*” (Pearson Education 1999: 442). In the same dictionary vernacular is defined by “*the language or dialect that the ordinary people in a country or area speak.*” (Pearson Education 1999: 740). Based on that, *neo-vernacular living environment*, in this research, refers to the current style for the set of the activities and its living structures, when it is expressed in similarity to the native indigenous ones.

B) Neo-vernacular

Oliver (2003) has implicitly referred to the vernacular architecture as “buildings of tribal, folk or peasant societies. Jencks (1991) has firstly mentioned the term neo-vernacular referring to a mixed renewal. In his opinion it is not far from the traditional family house. It is a halfway house which “*is not intended to be neither modern nor traditional, but a bit of both.*” (Jencks 1991: 82)

C) Un-vernacular

A term expresses the vernacular forms when the vernacular building process is being replaced by the commercialized architecture (Chase 1986 cited in Dabaieh 2011). The term is not used in this thesis, but it is meant for its aiming vision of questioning maintaining the vernacular dwellings’ spatial organisation, however, building it using industrialized building materials; “*questioning whether dwelling are un-vernacular in the way of building and vernacular in the way of thinking*” (Dabaieh 2011: 38).

D) Desert vernacular

“A desert oasis is a dwelling place with fertile land, vegetation and water resources from natural wells” (El-Gohary 1976, p. 362 cited in Dabaieh 2011: 40). For the desert oases communities trading played a role in forming its identity. The mutual architectural influence among the oases is reflected on the distinctive natural landscape of each oasis which shapes the special character for each of them (Dabaieh 2011: 47).

E) Indigenous architecture

A more accurate term to describe the kind of architecture that is ‘by’, ‘with’ and ‘of’ the native society of a specific region (Oliver 1987).

F) Passive design strategies

The term targets the design principles that utilize the available natural sources for the minimization of the undesired excess heat or cold of a building without using means of mechanized power (Givoni 1991).

2.3. LITERATURE STUDY OF PREVIOUS WORK

Despite resources on the architecture of *Qārrat 'Um-Āṣaḡīr Village* are too limited. However, few resources mentioned about its distinguished folklore and traditions as part of the Siwan culture, such as Suzan Yousef (2007), and others mentioned it in touristic guiding books, such as Cassandra Vivian (2007) and Gabi Thomas (2012). There have been also few newspaper and magazine articles telling about The Village and its society. In addition to exclusive reports at the institutions participated in the development projects of The Village, such as; *Maṭrūḥ* Governorate, New and Renewable Energy Authority (NREA), Environmental Quality International (EQI), North-West Coast Development Authority (NWCDA), and Shell-Egypt for petroleum. Despite those reports were exclusive in terms of the technical information they included and in terms of their affiliation, no publications included the socio-cultural and the architectural distinction of this area have been made.

CHAPTER THREE



THE RESEARCH METHODOLOGY

3. THE RESEARCH METHODOLOGY

In this chapter the case-study methodology will be explained in detail with justification for choosing it to answer the research questions. A detailed description on the research design and strategy will be given on in the different fieldwork phases. This will include an explanation of the participant-observation approach as the main method applied during the focused explanatory phase, along with the other methods applied during the whole research period. This will be followed by an explanation of the methods of data analysis.

3.1. CASE-STUDY METHODOLOGY *“The Methodological Approach”*

The research seeks to answer questions related to the cultural indigeneness of the living environments for an ethnic group lives in a remote desert area. This is in an attempt to understand their bases and explore what they are currently facing on both; social and environmental levels. Conducting a case-study research methodology is the most relevant procedure to answer such questions. Since this methodology is commonly used in research fields such as sociology and community planning (Yin 2009). Yin elaborated; *“the need for using a case-study arises out of the desire to understand complex social phenomena. It allows the investigators to retain the holistic and meaningful characteristics of real-life events, such as; small group behaviour, or neighbourhood change..etc.”* (Yin 2009: 4). Furthermore, the case-study methodology maintains a profound investigation to understand particular problems this research is concerned with. Based on the above mentioned reasons, and in order to achieve the research objectives the case-study methodology was chosen for this study.

Accordingly, it guarantees a profound understanding of *The Village’s* current situation, its social, cultural, and environmental distinction, and its reflections on the different living environments. Although the study is applied to a particular chosen area, it provides a comprehensive understanding of the situation in other similar cases. In addition, it maintains a deep understanding of the case currently studied, which supports much-needed research in the same area.

3.2. RESEARCH DESIGN AND STRATEGY

The research started with reviewing literature on the socio-cultural and environmental factors affecting the vernacular architecture of the remote desert areas. Thereafter, it was followed by the fieldwork survey. Qualitative methods were applied through the case-study methodology on *Qārrat 'Um-Āṣaġīr Village*. Four fieldwork trips have been conducted in a span of, almost, five month (Dec.2012/May2013) to Siwa Oasis, *Marsā-Maṭrūḥ* City and *The Village*, plus the period allocated for data analysis and writing the research report. Since resources on *The Village* are limited, the research was mostly confined by the fieldwork. It started with a preliminary investigation visit, and went through focused explanatory phase which had been the most important part included the application of the participant-observation method, until ended by an exploratory phase.

3.2.1. THE PRELIMINARY INVESTIGATING PHASE

An investigation visit to Siwa Oasis, were conducted in Dec.2012/Jan2013^[1] and *The Village* was visited as well. Direct observations, informal interviews, and community meetings in both Siwa Oasis and *The Village*, fig._3.01 & 3.02, were the main methods of the field-survey during this preliminary phase. Consequently, preliminary impressions were formed, which contributed in formulating more meaningful research questions



Figure 3.01: *The local community meeting in Siwa Oasis discussing present challenges facing the development of the oasis (Date: Dec. 2012)*



Figure 3.02: *The local community meeting in Qārrat 'Um-Āṣaġīr discussing its present situation. (Date: Jan. 2013)*

and accordingly the initial research work plan was adjusted. In addition to getting introduced to the governmental institutions, who have previously worked on the development of the living environments in *The Village*. This enabled the researcher at a later stage to list interviews with the representatives of these different institutions.

3.2.2. THE FOCUSED EXPLANATORY PHASE

Two field-survey trips have been conducted as the pillars of the focused explanatory phase. During which *Marsā-Maṭrūḥ* City (the administrative capital, which *The Village* belongs to its province) was visited in March 2013, in order to perform a needed institutional survey. The second was performed in Siwa province in March/April 2013, continuing the institutional meetings in Siwa town and performing the intensive fieldwork survey in *The Village* itself.

3.2.2.1. Thorough institutional survey

In this stage focused and in-depth interviews were performed with the different institutions' representatives. It was decided according to the importance of their interventions in *The Village* and its relevance to the initial research questions and objectives.

A) Focused interviews: A number of focused interviews were held^[4] with representatives from the Cabinet of *Maṭrūḥ* Governorate (in its different departments), and other governmental institutions such as NWCD, the Directorate of Housing and Utilities (DHU), and other private developers (e.g. Environmental-Quality International (EQI), fig._3.03). These interviews were held for short periods and focused on a set of questions derived from the research objectives as Yin (2009) advised. During these interviews the researcher followed Becker's (1998) advice (cited in Yin 2009) in posing the "why" questions in the form of "how" with trying to satisfy the purpose of the inquiry^[2].

Consequently, these focused interviews resulted in a general introduction about *The Village* concerning:

- Census on; areas, number of inhabitants, economic activities...etc.

- The proposed future development plans in on different levels; regional, local and domestic.
- The development projects, already executed in *The Village*.
- The possibility and feasibility of conducting the required fieldwork for the thesis.
- Starting a chain of contacts for people in the local authorities in Siwa.



Figure 3.03: Focused interview conducted with the director of EQI developments in Siwa Oasis.

B) In-depth interviews: It targeted interviewees onto two levels: the developers (e.g. Representatives of NWCDA), and administrators (e.g. Head of the LAU^[3] of *The village* who have been responsible for the execution of the most development's logistics, fig._3.04). The posed questions during these interviews were flexible to give the interviewee the space to propose his/her insights into the discussed topics as suggested by Yin (2009) which consequently determined the flow path for the rest of the interview^[4]. Accordingly, the researcher had access to:



Figure 3.04: Meeting with the head of LAU of *The Village* in Siwa city council

- Details of the different development projects that have been implemented during the past four decades in *The Village*, in the different fields, as well as the future housing proposals.
- The criteria followed by the governmental institutions in order to satisfy the community's indigenous needs in the provided housing prototypes, particularly referring to the functional organisation of the unit.

- The local municipality policy in implementing development project in participation of the local community.
- Technical details on the former and future housing projects in *The Village*; including building techniques and materials.
- General information about the rehabilitation project of *The Village's Old Şālī*.

These in-depth interviews resulted as the previous one again in a chain of contacts for well-informed interviewees from the villagers, who supported the research fieldwork.

3.2.2.2. *The Intensive fieldwork and Data gathering*

This research stage was mainly based on the two full days spent in *The Village* at the tribe's Sheikh (Head of the tribe) house with his family. Participant-observation, guided and direct observations, along with community meetings and interviews were the methods applied during this period.

A) participant-observation: During this period three families were visited. Both the researcher and (part of) the informants were aware that theirs is a field relationship, which according to Gold (1958) minimizes problems of role-pre-tending. This responds to Gans's (1982) concern about the dishonesty of this approach as the informants in most situations do not know that they are being observed. Hence, a participant-as-observer approach was applied, as called by Junker (cited in Gold 1958).

Accordingly, several daily life activities were shared with Şh's family and the other local villagers. The researcher participated in their food meals in the female zone, while the escort^[5] shared the same at the male zone in the same house. They participated in mourning rituals, which took place during the fieldwork period. During the fieldwork period the researcher attended girls' talks where she practiced type of their unique handcrafts, as well as drawing, together with the girls, sketches of their customs and handicraft products.

B) Guided and direct observation: Along with the direct observations, informants accompanied her to the ruins of the vernacular old settlement, fig._3.05. Explanations and clarifications on their lifestyle in the past

and present, in addition to the morphology of houses were given. Furthermore, guided explanations on six visited houses were given from the inside with elaborations on the functional configuration, their lifestyle patterns inside their houses and how each house has been developed.

C) Community interviews: It had been conducted with local villagers such as; natural leaders, master builder and his two assistants on-site fig._3.07, the village's midwife, employee at the LAU, and others. Around seven structured interviews were conducted in addition to the random street talks to children, girls and youth. These interviews addressed their house typology, and satisfaction of the house morphology and thermal comfort, along with their traditions and attitudes to adapt them both to their life.

D) Community meeting: Around eight to ten villagers attended a community discussion session; included the *Şih*, the mosque's *Imam*, the eldest natural leader, other trustworthy villagers, and interested youth, fig._3.06 & 3.08. The discussion focused mainly on the development of their living environments along the years, how they think about the current architectural developments in their village and what are their aspirations towards their future house designs in terms of the house morphology and building materials. This participatory brainstorming session held in order to develop a neo-vernacular approach for



Figure 3.05: *On-site noting for the guided observations*



Figure 3.06: *The researcher during a community meeting in attendance of Şih Mahdy (head of the tribe) and three other locals.*



Figure 3.07: *The master builder and two assistance during the interview on-site*

the living environment in *The Village* in the eyes of its inhabitants. The meeting also addressed the history of *The Village*, life style in the *Old Şālī*, in addition to the different development projects executed during the past four decades.



Figure 3.08: Panoramic view for the meeting with the natural leaders of *The Village*. The researcher is discussing their aspiration for the village's future house.

3.2.3. THE EXPLORATORY PHASE

In this phase the researcher joined a group of 24 international students to Siwa Oasis; in a spring school organised in collaboration between; Ain-Shams University in Egypt, University of Stuttgart and the National School of Architecture and Planning in Tunis. The group spent ten days, April/May 2013, of investigating, analysing, designing and finally executing alternative solutions for the present problems of the Siwan architecture (which is similar to the case in *The Village*). The spring school aimed at rethinking the architecture of Siwa in the neo-vernacular mantle through different approaches included; modernization of the traditional building materials, and combination possibilities of the building traditions in modern solutions. During this Spring School the researcher was part of the organising team, however, participating in all the discussions and the construction phases, fig._3.09 & 3.10.



Figure 3.09: The 4 x 3 m² room constructed during the Siwa Spring School (May 2013)



Figure 3.10: The researcher among the spring school participants on the construction site

3.3. METHODS OF DATA ANALYSIS

One of the main challenges of the analysis of data gathered during the participant-observation fieldwork, is that the amount of the data gathered is enormous and needs layers of filtration. However, important parts of data analysis are done while the researcher is still on-field and still gathering the data (Becker 1958).

Observation notes and interviews outcome had been written either on-site or directly after conducting it in a field-dairy with the interviewee's contacts, place and date, in order not to miss any important point of it. Few meetings and **guided observations have been video or sound recorded**^[6]. This was in the case of too long guided observations or a meeting with a large number of attendees^[8]. Sketches and photos were also captured on-site. After returning back from the intensive fieldwork, the researcher started visually to conclude and analyse the situation of the village. These sketches have been of a good added value to the recorded notes and pictures. Thereafter, a classification for all the data was done according to the topics that are related to the research question. Then, writing the initial report started. Then layers of additions, amendments, and rewriting are added by rereading the dairies and field notes, and coming back to text and analysis.

CHAPTER THREE NOTES

1 This was during a workshop organized by the IUSD-office at Ain-Shams University for the students and staff of M.Sc. IUSD 2011/13 along with expertise at the field of Architecture and Urban Planning, 29th Dec. 2012 till 3rd Jan. 2013. The workshop was sponsored by the Hans-Seidel organization and the German academic exchange service (DAAD). For sample questions paused during interviews, refer to the thesis appendices.

2 For further details about the conducted focused interviews and the type of questions paused, refer to Appendix I, section (3).

3 The head of the local municipality unit at *Qārrat 'Um-Āṣaḡīr village*, who was the researcher's key person in introducing her to the society of *The Village* and be able to interview them and perform the thesis field work.

4 Refer back to Appendix I for further details about the conducted interviews and type of the discussed topics.

5 Researcher's father accompanied her all along the intensive fieldwork period and in part of the other institutional meetings and interviews.

6 Such as the case of the participatory discussion workshop.

CHAPTER FOUR



*QĀRRAT 'UM-ĀṢAGĪR:
INDIGENOUSNESS AND ARCHI-
TECTURAL REFLECTIONS*

4. QĀRRAT 'UM-ĀṢAĠĪR: INDIGENOUSNESS AND ARCHITECTURAL REFLECTIONS



Figure 4.01: *The spirit of The Village represented in the ruins of the old fortress and a donkey driven.*

This chapter will explain the background of Qārrat 'Um-Āṣaġīr Village. The main concern of this recite is to reflect its consequences on the architectural character and the identity of the living environments in *The Village*, fig._4.01. Fieldwork and previous literature are the sources of the information presented. Interviews with the villagers and the different governmental entities, in addition to the participant- observation, and the direct observations are the main pillars of the fieldwork for this chapter. It will include a study on the location, ethnic origin, social structure, background from history, and the lifestyle in *The Village*, followed by findings of their architectural reflections in the living environment.

Qārrat 'Um-Āṣaġīr Village is the smallest inhabited oasis and village in Egypt (Anon 2008 ; Hamamo 2013). Despite different resources mentioned how harsh the life was at *The Village* compared to the life in Siwa Oasis, because of its remoteness, and limited area and water resources (Vivian 2007; Yousef 2007), it is prosperous of its natural views, and the distinguished culture, and history. In old times villagers used to live in the mud brick fortress built on top of the hilly outcropping, calling it *Ṣāḥīr*^[1]. Currently it is abandoned and one of the few remaining fortresses of that

typology (Vivian 2007). *Qārrat 'Um-Āṣaḡīr* is an Arabic name means the small up-hill place (Yousef 2007). The meaning represents *The Village*. *Al-Qārra* means a mountain or a hill (Al-Rafi'e 1932; Yousef 2007); the oases people used to give this name to the hills where they built their houses as a defense from the raids of enemies (Al-Rafi'e 1932). The villagers used to call it *Al-Ġārah* pronouncing *Al-Ġārah* in their native tongue. *'Um-Āṣaḡīr* means the Mother of the Little One (Vivian 2007), which represents its size. It is officially named *Qārrat 'Um-Āṣaḡīr Village* as the name of the nearby oasis, which is written on street signs and in official documents.. However, its villagers and the other surrounding communities call it *Al-Ġārah*. Officials at the governmental institutions call it *'Um-Āṣaḡīr Village*. It will be referred to as “*The Village*” in this research.

4.1. GEOGRAPHICAL LOCATION

The Village is located at the western edge of the Qattara Depression^[2] (Vivian 2007; Thomas 2012), fig._4.02. It is the only inhabited settlement at the depression and one of the remotest and isolated villages in the western Desert of Egypt^[3] (Vivian 2007; Yousef 2007; Thomas 2012). According to the official 2012 census, 512 inhabitants are settled there (IDSC 2012). Its coordinates are 29°37'25” N 26°29'53” E (Google Earth Feb. 2013), located on 120 kilometres^[4] to the North-East of Siwa Oasis, fig._4.02 (Vivian 2007; Yousef 2007; Anon 2008).

The Village is located in the administrative province of Siwa Oasis, which is located in the administrative province of *Maṭrūḥ* Governorate. *Maṭrūḥ* Governorate covers around 22% of the total Egyptian land area. However, only 5 % of the Egyptian population is living in it leaving around 95% of it as vacant desert lands (Anon 2008). Most of this population are concentrated along the Northern Coast. *The Village* covers an area of around 125 square kilometres^[5] (IDSC 2012); 16 kilometres long and 8 kilometres wide (Vivian 2007), surrounded by; *Qūr Allaban* region from North, *Tabaḡbaḡ* region from South, *'Ayn Kifārā* region from East and *Ġabal 'Afyā* mountain chain from West (IDSC 2012), fig._4.04.

Cutting the road to *The Village* is either from *Marsā-Maṭrūḥ* or Siwa Oasis. It is around 270 kilometres in total from both of them*. One has to cut

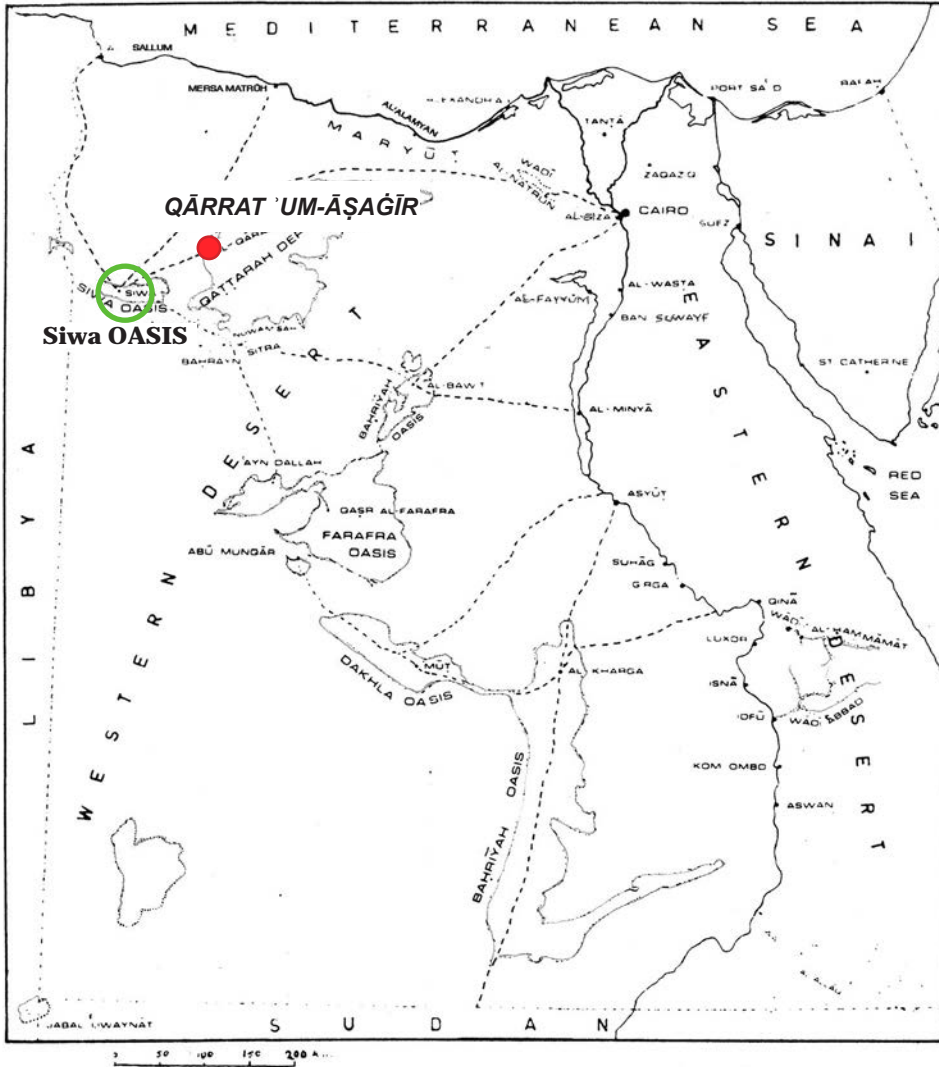


Figure 4.02: Qārrat 'Um-Āşāġir Village and Siwa Oasis are located on Egypt's map (After: Fakhry 1990, 9)

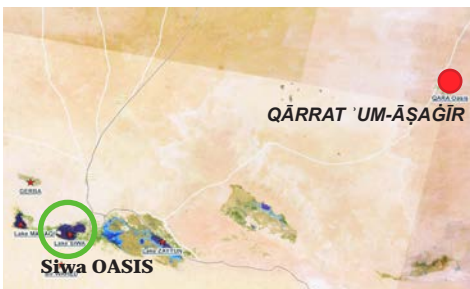


Figure 4.03: The Village's location (After IUSD office, after Google Earth Dec. 2012)



Figure 4.04: Qārrat 'Um-Āşāġir Oasis surrounding landmarks and the administrative borders (After Google Earth, July 2013)

150 kilometres into the regional road of (*Maṭrūḥ-Siwa*) until reaching the halfway point, called *Bi`r Al-nuṣṣ*^[6], fig. _4.05 & 4.06. It is the first of three military check points on the way to *The Village* to check for the permissions. It has basic Cafeteria. Thereafter, road changes to a non-properly sealed (*Bi`r Al-nuṣṣ - Al-Ġārah*) with a width of 4 meters for 120 kilometres long until reaching *The Village* (IDSC 2012). There are no landmarks along the road except for yellowish sandstone mountains on both sides from time to time.

“In 1909-49, before WWII, Al-Ġārah used to be the main rest point on Maṭrūḥ-Siwa and Al-Ḥammam-Siwa trade roads via Qattara Depression.” Said one of the elders and natural leaders.

Vivian (2007) mentioned two historical trading roads start from Cairo and Alexandria to Siwa Oasis; passing by Qattara Depression. Most probably, travellers on these roads used to stop at *The Village* as the only permanent society in the Depression.

“Al-Ġārah has been marginalized only after WWII, when Maṭrūḥ-Siwa road has been shifted to pass through Bi`r Al-nuṣṣ instead of Al-Ġārah.” Said one of The Villagers

Before the road shift, villagers used to travel between *The Village*, Siwa and *Marsā-Maṭrūḥ* using donkeys arriving to *Siwa* in three days. Nowadays, after the road has been set, the government provided *The Village* with an official microbus to



Figure 4.05: *Bi`r Al-nuṣṣ: The halfway point*



Figure 4.06: *Roads to The Village from both; Marsā-Maṭrūḥ and Siwa Oasis through Bi`r Al-nuṣṣ*

drive the villagers to *Siwa* one a week to spend their needs. Further developments for the (*Bi'r Al-nuṣṣ – Al-Ġārah*) road is planned to be implemented in the course of the coming three years (2013/2016)*.

4.2. CLIMATIC CONDITIONS

The village is located in hot-arid zone. In habitants of these zones can tolerate higher temperatures according to the acclimatization phenomenon (Givoni 1991). However, these zones are defined by hot daytime, cold nights, low humidity, and high solar radiation, in addition to sudden destructive sandstones that are caused by its common strong, rapid and hot winds (Ahmed 1985; Dabaieh 2011). The latter occurs 90% of the year (Ahmed 1985). Accordingly, the villagers adapted their dwellings to these dusty winds through effective solutions to avoid harmful effects (Dabaieh 2011).

In 2010, annual mean temperature ranged between 38-45°C during daytime in the Western Desert oases. However, in nights it dropped to a range between 10-20°C and reached 0°C in cold winters (EMA 2010 cited in Dabaieh 2011).

4.3. ETHNIC INDIGENOUSNESS AND ORIGIN “The Social Structure”

In the past, there was a legend telling the number of *The Village's* inhabitants is constant (Vivian 2007; Yousef 2007; Anon 2008). If they had a new born, an old one should die. However, the census of IDSC of *Maṭrūḥ* Governorate states 468 inhabitants in 2011 and 512 inhabitants in 2012. Despite the number of its villagers is increasing every year, it is still the smallest inhabited oasis all over Egypt (Anon 2008; Hamamo 2013). They are a low-income community depends mostly in their living on subsidies. This poverty^[7] is rooted to the past when *The Village's* *Ṣālī* was the centre for slave trading (Al-Rafi'e 1932; Vivian 2007). Therefore, the government recently supported them with private lands for reclamation*.

The Village's community is the tenth of the nine Siwan tribes (Vivian 2007). Anthropologists connect the definition of the ethnic group not only to the common facial features but also to the cultural values that tide the group together (Ismail 1975) who share their unique way of talking, wearing their customs, type of

their food, and building their homes (Yousef 2007). Therefore, *Qārrat 'Um-Āṣaġīr* villagers are considered part of the Siwan community. Its indigenous community is a descendants of *Al-Ḥamūdāt* tribe; a distinctive ethnic group from barbarian origins fig._4.07 (Vivian 2007; Yousef 2007; Anon 2008; Thomas 2012). Their geographic remoteness led to a cultural isolation of its inhabitants. This resulted in the maintenance of their communities' social structure, habits, and culture (Ahmed 1985). According to their mores *Ṣḥ*^[8] is the head of the tribe and has the upper hand in all *The Village's* important matters, after discussing it with the community. Although they have no written legislations, customs and penalties are fairly applied on all the tribe members (Yousef 2007).

Anthropologist did not agree on one origin for the Barbarian tribes. Part of them claimed; they are migrants from the Scandinavian Countries, because of the similarity in language (El-Zeiny 2011), others claimed they came from the southern part of the Arabian peninsula but invaders intermarried with them (Vivian 2007; El-Zeiny 2011), the last group said they are the indigenous people who settled in the area since the dawn of humanity (El-Zeiny 2011). However, the second interpretation is the most relevant to the situation of *The Village* because of their facial features, social structure, and tribal, hosting and living traditions; which are quite similar to the Arabian Bedouins.



Figure 4.07: Local youths, aged between 11-17 holding a sign from the old *Ṣālī* and a handcrafted plate out of palm fronds.

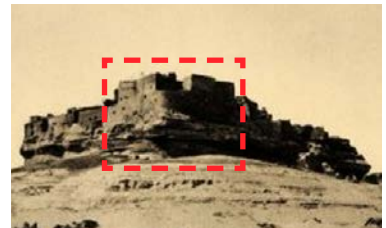


Figure 4.08: *Qārrat 'Um-Āṣaġīr* old *Ṣālī* dated back to 1929 [A digital version of an original photogravure by Geilinger, source: <http://www.amazon.com/1929-Oasis-Egypt-Fortified-Photogravure/dp/B005DH4YHK>, accessed: 10.03.2013]



Figure 4.09: The ruins of *The Village's* old *Ṣālī*, Jan. 2013

Yet, Arabic language is the official language of *The Village* (Vivian 2007; Thomas 2012), however the villagers still speak the Barbarian (‘*Amāzīgī*) language^[9] among each others. It is still their mother tongue that has an outlandish accent , a bit similar to the Germanic languages, which is not understandable for the Arab speakers (El-Zeiny 2011). They speak Arabic only with foreigners or at schools. Yet, a high percentage of the village’s women do not speak Arabic properly except for the educated girls.

4.4. QĀRRAT ’UM-ĀṢAĠĪR: A BACKGROUND FROM HISTORY

The Village was part of an ancient kingdom stretched to Nubia. Siwa was its capital as said by Bayle St. John, a traveller from the 19th century (Vivian 2007). Despite, there is no evidence on the age of the village’s old *Ṣālī*, it does not date back later than Siwa’s *Ṣālī*. Hence, the Siwan society consists of several tribal origins with more population than *The Village* (Vivian 2007; Yousef 2007; Thomas 2012). Moreover, Siwa was the end of the trading routs when *The Village* was only a rest point (Vivian 2007). Thus, Alexander the Great entered Siwa via *The Village* (Vivian 2007) and on his way back his caravan got lost, ran out of water and was hit by a rainstorm, therefore stopped at *The Village*, then continued south to Siwa then to the rest of his travel (Vivian 2007).

People were living in the old *Ṣālī*^[10] which was built with *Karšīf* and *Tlaḥt* (the contextual salty mud in the villager’s local), fig._4.08. Houses and all their life were up on the outcropping. They used to go down only to look after their farms Δ. It was built to protect them from the raids of enemies (Vivian 2007; Yousef 2007; Anon 2008; Thomas 2012). In 1982, two days of storm hit *The Village* (Vivian 2007). Another three days of heavy windy-rains destroyed the *Ṣālī*, in 1985, and *The Village* was devastated, fig._4.09 (Yousef 2007; Anon 2008; Thomas 2012). People were only saved because of the sandstone houses provided by the government in the proximate plain land Δ.

4.5. THE VILLAGE'S LIFESTYLE

A) Primitiveness: Lifestyle rhythm at *The Village* is calm and comfortable if compared to any of the surrounding communities. Time management is highly dependable on sun movements and prayer times rather than watches. Women do not care about time “*I usually wake-up with the sun, and after Isha' Prayers I stay for a while, I don't pay attention when I sleep or when I get-up, but I must be awake in the morning*”, said one of *ṣiḥ* Mahdy's daughters. Villagers still use their donkeys as their transportation mean. They use donkey driven carts to transport their needs, or to move to and from their farms, fig._4.10.

B) Social Life: Even after the abandonment of their Old *Ṣālī*, they are still maintaining their social cohesion. Exchanging visits and social gatherings are part of their lifestyle, fig._4.11. Their enclosed community maintains safety in *The Village* (Yousef 2007). Home doors are left open most of the time to receive visitors at anytime.

C) Hospitality: Village visitors are received in strong hospitality traditions. The head of the tribe welcomes them upon their arrival to the village, in the guest-hall, fig._4.12, at the heart of *The Village*, before starting their tour visit (Vivian 2007; Yousef 2007). This strong hospitality came as a result of their adherence to the Bedouin mores.



Figure 4.10: Using donkey carts as transportation mean in *The Village*



Figure 4.11: An outdoor male tea-gathering in *The Village*



Figure 4.12: *The Village's* guest-hall

4.5.1. WOMEN AND GENDER ISSUES



Figure 4.13: Two local ladies at the street dressed in their local unique customs *Tarfūṭit*



Figure 4.14: One of the local girls, dressed in a wide dress with the common hairstyle.

A) Gender issues: Gender segregation is one of the significances of the tribal conservative communities. Females are not allowed to talk to foreigner males^[1] and vice versa. This shapes a unique world for each one of them (Yousef 2007). Which resulted in different house concepts such as; the existence of *Marbū'ah* and the *multi-entrances* concepts. They do not mix neither for having talks, sitting nor eating (Yousef 2007). Women are most of the time at their homes; either cooking or working on embroidery textiles, or even at their unique handcrafted tools made out of palm fronds. While men are most of the time involved in the outside world; either working on their farms or looking for a living in Siwa or *Marsā-Maṭrūḥ*. Consequently, it is recognizable that men are more likely to speak Arabic at the outside world, while women are satisfied with their *'Amāzīgī* language. Therefore, it is common to find the properly, however, it is the official language of the village, but it is still not their mother tongue. Young girls are not restricted to wear specific custom, unless it should be a wide dress, fig._4.14. This is up to the age of 12 years old when they have to cover her hair with a scarf or a veil (Yousef 2007). Thereafter, when she gets married, she must wear the *Tarfūṭit*, fig._4.13 (Yousef 2007); their unique blue customer textile which is the same as the Siwian one. They wear it on their home dress, when she goes out home, then takes

it off if she arrives at her neighbour's home, where no foreigner males are there. *Tarfūtit* is a blue textile with traditional needlework, which must cover all her body from head down to feet. She holds it with her hands directly under her chin, so that nothing should appear from her face

B) Women: However, the village's community, in a way, is less conservative than the Siwian community (Yousef 2007). Women in *The Village* can go out on their own if she wants to exchange visits, but she is not allowed to stay out her home late after sunset except for a reason. She also goes out to help her husband in farms on harvesting seasons. However, nor see their face, unless she is his wife, daughter, mother or aunt. This tradition of mutual visits and man\women segregation lead them to separate, at least, two entrances at their homes; one is used by foreign male visitor and the other one is used by women and the household.

C) Marriage: Males' average marriage age in *The Village* starts from 20 years, while girls are ready to marry once they finish their school at the age of 15 Δ, given that, the females' official marriage age is 18 years*. They intermarry with other tribes abiding by doctors' advices*, and due to their interaction with the surrounding communitiesΔ. The mother is the coordinator in initiating the marriage process the couple's fathers sit together to fix the agreement Δ. Weddings usually last for seven continuous days of gender separated celebrations (Yousef 2007).



Figure 4.15: The two parts of the traditional cooking corner 'Iṣṭāḥ-nṭābint



Figure 4.16: Outdoor space where males celebrate weddings and the banquet is served

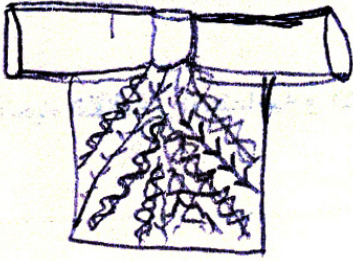


Figure 4.17: The traditional wedding dress 'lšrāḥ drawn by a local girl



Figure 4.18: The traditional bride's wooden box



Figure 4.19: Marriage greetings is written on the facade of a newly married's house



Figure 4.20: Outdoor male consolation tent

Elder women are usually busy with preparing food for the well-wishers, which is usually cooked and baked at the 'lṣṭāḥ-nṭābint (The traditional stove space), fig._4.15, while the banquet is served at the outdoors; for men fig._4.16. Women enjoy celebrating it indoors on the sound of drums, songs and dances. At the wedding day the bride wears 'lšrāḥ (Yousef 2007), which is a black^[10] silk dress with traditional overdone needlework and ornaments fig._17.

In the marriage traditions the bridegroom is responsible for preparing everything for their new home, which is usually an extended room or suite at his father's house, until the government provides them their new home *Δ. The bride's room should be newly painted and decorated with palm, flower, bride and other geometrical drawings (Yousef 2007), where her stuff is stored in the traditional carved wooden box Δ, fig._4.18. Greeting statements are written on the facade of the couple's new house from the outside, fig._4.19.

D) Consolations: A women wears white custom by her husband's death (Yousef 2007). She should not leave her house for continuous four months and ten days Δ, as per Islam^[11]. Therefore, the rest villagers respect these mourning feelings and do not celebrate any weddings during long period. As per weddings, consolations are also gender separated. It lasts for three continuous days, after the death. Males gather sit in an outdoors Bedouin tent fig._4.20, where they start

the consolation with preaching on death followed by a banquet for the good spirit of the deceased. Women solace at the dead's house without sticking to specific custom or dress code. Only members of the first kinship degree^[14] of the deceased are condoled.

E) Handcrafts: Handcrafting is one of the activities that gather women and men, still, separately and sequentially fig._4.21. Women are responsible for waving palm fronds into braids, while men stitch them together forming their unique baskets and tools (Yousef 2007). They use colourful threads in their textile needlework (Vivian 2007; Yousef 2007; Anon 2008; Thomas 2012), brocading it with geometrical shapes, palm and flower drawings, fig._4.23. They use five colours red, green, orange, yellow and black; representing the date's maturity stages (Gans 1982; Vivian 2007; Yousef 2007), in addition to other imported artificial coloured dyes, such as; blue, rose and purple fig._4.22. They used it for domestic purposes before they started making a living by selling them to Siwan tradesmen or to village visitors. Handcrafting is usually practiced during family or female gatherings in the living space at the home's private zone.

F) Culture: Celebrating their local feasts like *Mūlid Al-Šiyḥ Yağā*^[15] twice a year at the outdoor space in front of his *Maqām* (Yousef 2007), fig._4.24, with a banquet offered by all the villagers. Maintaining their heritage culture is



Figure 4.21: A local girls showing the unique process of their handcrafts out of palm fronds



Figure 4.22: Traditional handcraft products gifted to the researcher



Figure 4.23: Drawings of a local girl for the common needlework ornaments



Figure 4.24: Two mausoleums in The Village, Maqām Al-Šiyḥ Yağā is on the left



Figure 4.25: A local girl's drawing showing her friend in traditional dress with the common hairstyle

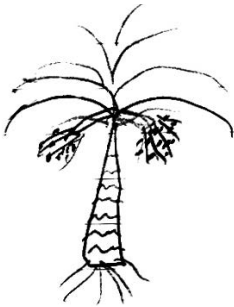


Figure 4.26: Trees are expressed with fruits (Left: an egg plant tree, Right: a palm tree)

expressed in their drawings too. When drawing a girl, it is expressed in their traditional dress with their common hairstyle, fig._4.25. When drawing a tree, it is expressed with its crops; either dates, olives, egg-plant, fig._4.26...etc. It is the expression of the fruits that comes along with the trees.

If they drew, they draw their handcrafted unique products. Drawings express a culture which is beyond; and can only be expressed if it is lived or evidenced.

4.6. INSIGHT ON COMMUNICATION AND ISOLATION

Until now, *The Village* does not have neither a network coverage nor land line telephones; except for a satellite telephone based in the LAU. It has been activated in May 2012 for the public usage*Δ. It is rate is as cheap as the cell-phone and is able to receive and send calls to any type of telephones. Before this one the expensive *Turyyā* satellite phone had been used only for emergencies (IDSC 2012). Further plans for wider provision of network coverage are still under negotiations*.

"I remember in the early 70's I rode my dokey to Siwa, spending three days on the way, to call for a doctor for my sick sister."

Said Sheikh Mahdy (Head of the tribe)

The Village spent many years without any communication means, until the late the 70's when the Military Boarder Guard unit was placed there. The unit had its own communication

system which supported *The Village* only in emergency cases Δ. Nevertheless, they still do not have a fire fighting unit (IDSC 2012). This causes havocs because of its remoteness and isolation in case of serious fires, the last one was in Feb. 2013 (Meshaly 2013). Furthermore, the limited penetration of the remote areas is reflected in the quality of the services provided, such as; roads, communication, water, electricity, health, and education (Ahmed 1985).

4.7. CONCLUSION AND ARCHITECTURAL REFLECTIONS

The remoteness and isolation of The Village has kept its identity, which produced one of the most conservative and socially maintained societies that can be found nowadays in Egypt. There have been a mutual interaction between the villagers' lifestyle and the functional organization of the spaces in their vernacular dwellings. This is reflected onto distinguished architectural features and design concepts in their homes, such as the separate entrances, *Marbū'ah* (traditional male-guest room), the winter-room, *ḥūr* (traditional dry toilet) in its dry/wet zones, *'Iṣṭāḥ-nṭābint* (traditional stove corner), and *Miṣṭāḥ* (traditional storage space).

Concept of the multi-entrances is to provide, at least, a private entrance for the house apart from the entrance used by male visitors, fig. _4.27. Male entrance leads to *Marbū'ah* space, which is



Figure 4.27: Two entrances for one house



Figure 4.28: *Marbū'ah* with two door cases



Figure 4.29: *The hūr with a southern outlet opening*

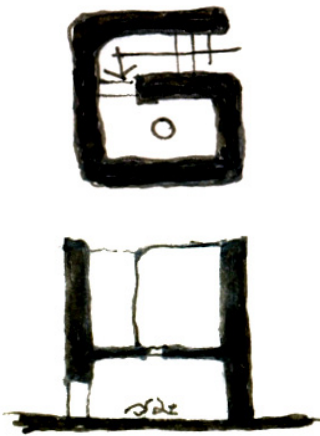


Figure 4.30: *Above: plan for the elevated hūr room. Below: cross section in the traditional hūr unit.*



Figure 4.31: *Misṭāḥ the old traditional storage room*

the male guest room. This room is feature by having two door-cases; one as the house's male entrance and another one leads to inside the house, fig._4.28.

The winter room is an enclosed space at the heart of the house with limited small window openings. In some instances, it has a fire corner. It is the place where the family gathers in winter times, when they had chances for storytelling on tales about their ancestors, traditions and ethics.

Hūr is oriented to the south in order to take away the smell. It is an elevated room with a hole in its floor fig._4.30. The small space is used to gather the human wastes, where they are collected from its southern outlet opening fig._4.29. Wastes are gathered every six months to be used as soil fertilizers.

'Istāh-ntābint is the traditional stove corner, found the traditional kitchen fig._4.15. It is similar to the one found in Upper Egypt except it is built out of Tflah (the contextual salty mud) and has tiny top opening.

The villagers self-sustained living in homes adapting their life to the remoteness and isolation. Therefore, they provided Misṭāḥ the traditional storage space fig._4.31. They used to store dates in it. Today it is used as a space for storing the battle feeds. However, they still cannot dispense the storage room where they store their foodstuffs.

CHAPTER FOUR NOTES

1 *Šālī* means the small town or village, in the villagers' *Amāzīgī* native tongue (Yousef 2007; Vivian 2007).

2 Qattara Depression is the largest Depression in Egypt and Africa (Vivian 2007). It covers around 20,000 square kilometres (Thomas 2012). Most of its area lies under the sea level and the lowest point is in the western section 35 kilometres southeast of *The Village* (Vivian 2007) and it is 144 meters under the sea level (Thomas 2012). It is said to be formed after exposure and sedimentation effects (Thomas 2012). Vivian (2007) considered *Qārrat 'Um-Āṣaḡīr* as one of the minor depressions in the Western Desert of Egypt apart from Qattara Depression, which she considered as one of the seven major depressions in it. However, several references describes *Qārrat 'Um-Āṣaḡīr* as a western edge of the Qattara Depression.

3 The Western Desert of Egypt is part of the Libyan Desert at North Africa, the largest desert in the world. It covers the first 500 kilometre of 1,760 kilometres (the whole width of the Libyan Desert) to the west of the Nile Valley. It covers around two-thirds of the area of Egypt (Vivian 2007).

4 However, there are various records about the distance between Siwa Oasis and *Qārrat 'Um-Āṣaḡīr Village* this is the most repeated figure. Thomas (2012) mentioned 130 kilometres and Vivian (2007) spoke about using odometer for measuring during her trip from Aghurmi to *Qārrat 'Um-Āṣaḡīr* via Qattara Depression scored 123 kilometre, and another old source (Al-Rafi'e 1932) mentioned 90 kilometres.

5 This figure is for the administrative boundaries, however, it covers an area of 65 square kilometres as a cordon boundaries (IDSC *Maṭrūḥ* Gov. 2012).

6 It is also called Bir Fuad Al-Awwal as (Vivian 2007) mentioned. It was one of the stop points on the famous Sikket Al-Sultan road from *Marsā Maṭrūḥ* to Siwa; the most famous road for being used by Alexandar the Great, kings Fuad I and Farouk (Vivian 2007).

7 Once the government imposed them a tax of five Egyptian pounds per year. Although it was a small amount, they were not able to abide by in the year 1928-1929. Accordingly, the government exempted them from its payment (Al-Rafi'e 1932).

8 *Šīḥ* Mahdy is the current official head of the tribe in *Qārrat 'Um-Āṣaḡīr*, who succeeded *Šīḥ* Hassan. He retains The Village's guest book of all visitors they have had including writings in different languages (Arabic, English, Italian and French) (Yousef 2007). *Šīḥ* Mahdy is the one who hosted the researcher in his home all along the fieldwork survey.

9 Other societies in Maghreb Countries speak the Barbarian language (Thomas 2012). They write it with special alphabet, however, in Siwa it is not written. If they do, they write it in the Arabic alphabet, but it is wrongly pro-

nounced by the foreigners, even the Arabs.

10 For further details on the lifestyle in the old *Ṣālī*, kindly check next chapter: section 5.3. Life in The Old *Ṣālī* Fortress, P. 57.

11 Foreigner male in this context means; this male is not of a first degree of kinship. He is not a husband, a father, a brother, a son nor a grandpa.

12 On contrary of the worldwide tradition; that a bride wears a white wedding dress and people wear black at consolation occasions. In *The Village* it is the opposite.

13 Surat Al-Baqara, verse no. 234.

14 Father, brother, son or wife and what matches.

15 However, as the villagers told; they stopped celebrating it nowadays for no fixed reason.

* Interview result with representatives from Siwa Town Council and *Qārrat 'Um-Āṣaḡīr* Local Administrative Unit.

^ Interview result with representatives from North-West Coast Development Authority (NWCDA); based in *Marsā Maṭrūḥ* city and Siwa Oasis.

Δ Interview result with *The Villagers* and the natural leaders.

CHAPTER FIVE



QĀRRAT 'UM-ĀṢAGĪR: SITUATION AND TIMELINE OF DEVELOPMENTS

5. QĀRRAT 'UM-ĀṢĀĠĪR: SITUATION AND TIMELINE OF DEVELOPMENTS

Having previously highlighted on the main issues affecting the lifestyle and architectural inherited distinction of *The Village*, this chapter will provide further analysis of the present situation of it, to better understand its present built environment and the timeline of developments it went through. The information presented in this chapter is based on the data gathered through the interviews conducted with representatives from the NWCD, Siwa Town Council, and the LAU of *The Village*, along with informal street-talks and interviews conducted with the local villagers. Furthermore, it comes as a result of the direct and guided observations accomplished at *The Village*.

5.1. MORPHOLOGY OF THE VILLAGE “*The present situation*”

As observed at *The Village* its urban morphology is divided into two different juxtaposed characters. One is the old Ṣālī fortress with its compacted urban form and the vernacular houses surrounding it under the outcropping shaping the group of the vernacular old settlement, fig._5.01. Counter to it is the down-built houses on the plain land in proximity in front of the vernacular old settlement, shaping the group of the new developments, fig._5.02 (Vivian 2007 ; Yousef 2007.)



Figure 5.01: *The vernacular old settlement (The Ṣālī and the surrounding houses in proximity to the outcropping)*



Figure 5.02: *The down-built developments on the plain land*

5.2. THE HISTORICAL GROWTH AND TIMELINE OF HOUSING DEVELOPMENTS

As previously mentioned the indigenous villagers lived for hundreds of years up in the Old *Şālī* fortress (Vivian 2007 ; Yousef 2007; Anon 2008; Thomas 2012). During the past four decades, several development interventions have taken place at *The Village*. Those interventions were not only limited to the development in the housing sector, but further. It included other development sectors, such as; agriculture, economy, communication, education, health, and transportation*. However, only the development of the housing sector will be studied in detail. Hence, it has positive implications on most of the other developments. Further milestone interventions will be mentioned, which acted as leaps for the development of *The Village*.

The developments in the housing sector started simultaneously when the villagers began to abandon the *Old Şālī* fortress and the surrounding vernacular houses. The World Food Development Program (WFP), that have been provided to the villagers under the direction of the Cabinet of *Maṭrūḥ* Governorate Δ, included developments on both; agricultural and housing sectors*. The Desert Development Authority^[1] (DDA) was responsible for the implementation of the housing part, the first phase of the governmental provided units; '*Allām Housings* fig._5.03. Thereafter, the government continued to provide more housing units in subsequent phases, fig._5.03. Each phase has its own constrains, regulations and policy of implementation.

5.2.1. LIFE IN THE OLD ŞĀLĪ FORTRESS

As observed and told through a guided observation visit to the ruins of the Old *Şālī* fortress the ancestors of the indigenous villagers used to live in it (Anon 2008). *Şālī* means the village in the Siwan tongue (Vivian 2007 ; Yousef 2007). *The Village's Old Şālī* fortress has a compacted fabric, fig._5.04. Fakhry (1944) resembled the life in Siwa's *Old Şālī* as a "Beehive". Life in *Qārrat 'Um-Āṣaġīr Old Şālī* was similar. It accommodated more than 200 inhabitants hundreds of years

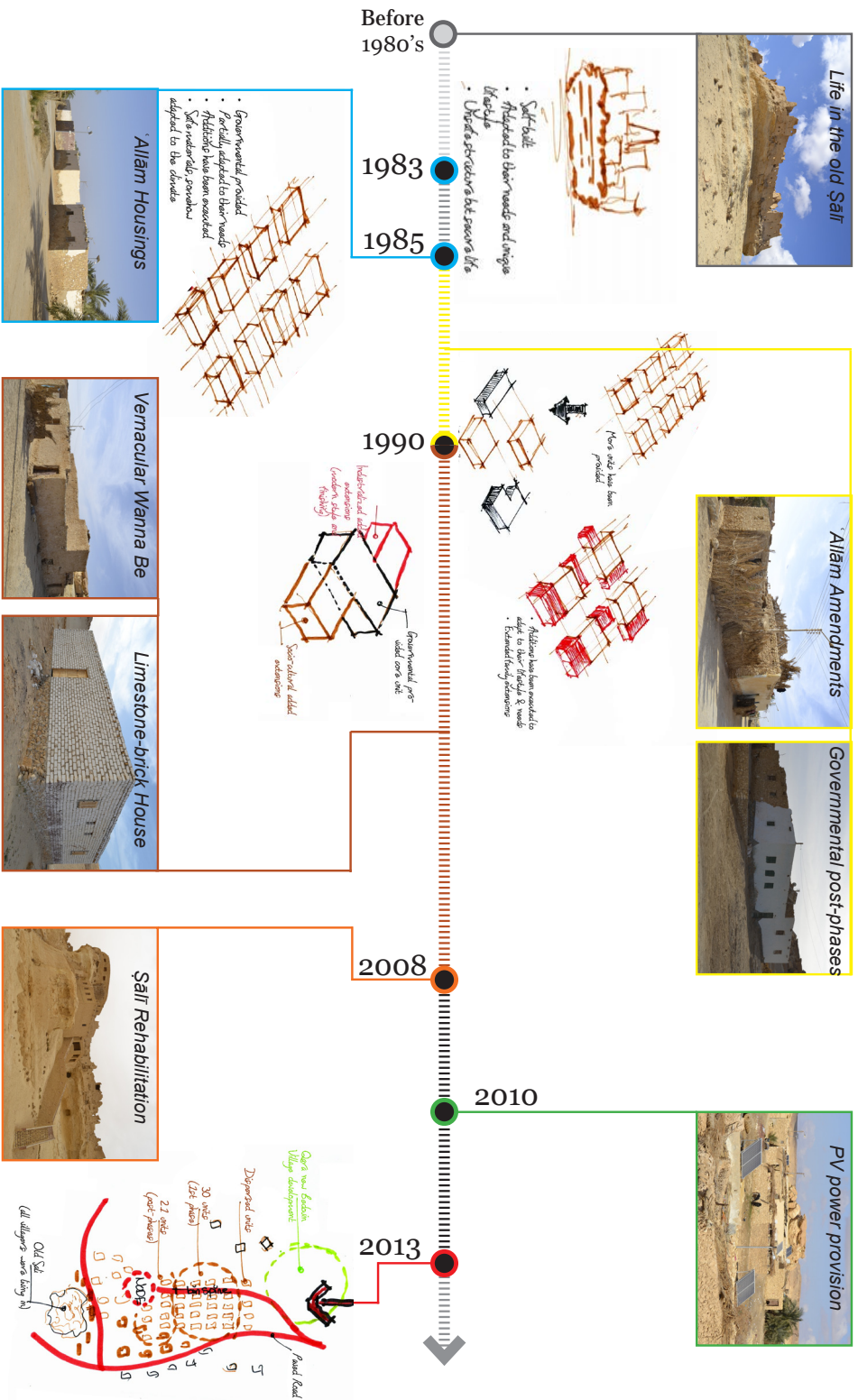


Figure 5.03: Timeline indicating the historical growth and the development interventions of The Village

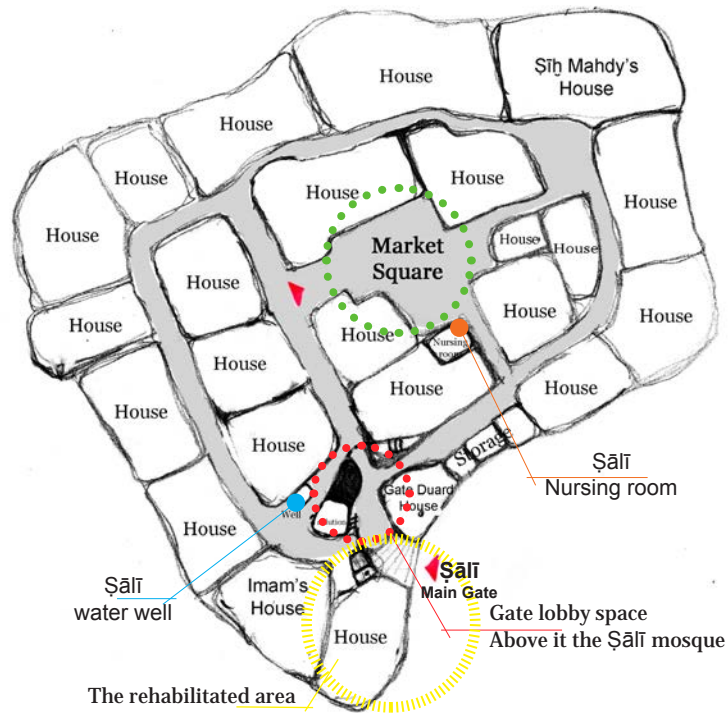


Figure 5.04: Map of the Old Şālī
 (Developed by the researcher based on; site-observations, explanations by Hajj Soliman (One of The Village's natural leaders), and guidance of Google Earth aerial view, March 2013)

ago (Vivian 2007 ; Yousef 2007; Thomas 2012). It had one gate (Vivian 2007) and was surrounded by a massive fortified-wall, which embraced little openings to detect any stranger visitors or enemies. The *Old Şālī* had a central market place, fig._5.04, where the villagers gathered to exchange goods. The *Old Şālī* was also sufficient in terms of housing its own well, fig._5.05, primitive nursing rooms, and a mosque, fig._5.08 & 5.09. Its streets were narrow, mostly shaded (Vivian 2007), labelled in the Siwan tongue, fig._5.06. One by moving around its ruinous condition, feels as Fakhry (1944, 6) mentioned “we go from ruined house to another as if we are roaming in a town of the dead.” fig._5.07. This abandonment has been reasoned by the increase of the number of the villagers, which the limited area of the *Şālī* did not accommodate.

The *Old Şālī* used to be home for more than 400 inhabitants till the beginning of 1980's, when the Egyptian government provided them with modern new houses down in the desert. The government wanted to support them with

modern homes and means of comfortable living; it built modern new houses with new facilities to help them live a simple social living. It also provided them with a mosque, school and social centre. (Anon 2008) After the number of the villagers has been increasing more and more, while they were all living in the *Old Şālī* fortress, the space up the *Şālī* hill has been insufficient to their growth. Some families decided to extend down to the *Şālī* building vernacular housing using the same know-how techniques that their used to build with up in the *Şālī* hill. These two living period produced, what is looked at nowadays as, the Vernacular housing typology. It is said that this living environment had been satisfying their socio-cultural and environmental needs to a point of time, until their number increased, the lifestyle has been quicker, in addition to their aspiration to the modern life, and the technical problems they faced with this kind of vernacular building technique and materials^[2].

After this period of time, they started to abandon this kind of the living environment to the new one provided by the government. Since then the developments have been taking place at *The Village*, until nowadays. Yet, it can be observed and categorized as mentioned before and as illustrated at fig._5.03.



Figure 5.05: *The water well within the Old-Şālī*



Figure 5.06: *Restored street name in the Old Şālī*



Figure 5.07: *The houses ruins of the Old Şālī*

5.2.2. THE GOVERNMENTAL HOUSING PROJECTS

Governmental housing projects in *The Village* are divided into three phases. Two of them have already been implemented, and the third one is still in its first development stages.

5.2.2.1. First Phase: 'Allām Housings

The provision of the governmental housing units in *The Village* has started in the beginning of the 1980's (1983-1985) with the provision of the first thirty housing units on an area of 5 feddans[^]. This first phase consisted of thirty identical^[3] prototypes with an urban distribution of six columns by five rows, fig_5.10. The units were built under the responsibility and financial support of the DDA and executed by *Hassan 'Allām Contractors*. This is why the villagers call these thirty units *Qaryit 'Allām* (*'Allām's Village*), referred as *'Allām Housings* in this research, fig._5.11 & 5.12. Different resources mentioned that those units were provided after the vast disastrous three-days rains that *The Village* faced in 1985 and the devastation of the old vernacular settlement (Vivian 2007; Yousef 2007). However, the villagers mentioned they had been the only surviving shelters during the three rainy days. The prototype of those thirty housing units was designed by architects from the DDA, which called it the *Bedouin House Model*^[4]. It was as an attempt from the government to improve for the villagers' lifestyle and quality of life providing



Figure 5.08: *The Old-Mosque in the Şālī after restoration*

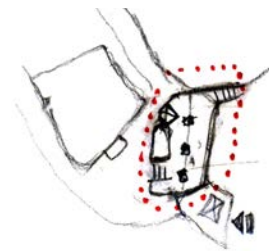


Figure 5.09: *Plan of the Old-Mosque (Developed by the researcher based on fieldwork observations)*



Figure 5.10: 'Allām Housings block (after Google Earth March, 2013)



Figure 5.11: Part of 'Allām housings



Figure 5.12: One of 'Allām Housings prototypes still visible without extensions

it to them free of charge[^] *. During this phase a primary school, a handicrafts centre, a mosque, and *The Village's* guest hall, were built as well* Δ.

5.2.2.2. Later Phases: Governmental housings Post-Phases

After the first thirty units, in 1985 the government provided more 21 housing units for the further improvement of the villagers' quality of life by encouraging the independence of each nucleus family. However, this time the land were allocated, and the beneficiaries were provided by the materials in an interest-free loan paid in instalment bases, which had to be paid them back in 10 years. The beneficiaries had to build the units by their own under consultation of an appointed site-engineer from NWCDA. The monitoring and provision of materials during the construction process of the housing unit were based upon three main milestones; 1) The base foundation (Qessya), 2) The construction of the walls and openings, and 3) The construction of the roof and installation of the openings' frames. Through this system the owners had the flexibility to amend on the house design from an early phase of the house construction, despite, paying for any excess expenditure by their own. Knowing that, the allocated budget has been afforded for the construction of the Bedouin House Model as previous, but in a bit larger floor area. After the provision of those 21 units (51 units in total), provision of further units took place.

Vivian (2007) mentioned in 1990, there have been 57 houses in total. In 2010, there 75 houses existed in total, which have been provided by the domestic PV systems.

5.2.2.3. *The future Bedouin village*

The NWCDA is planning to provide *The Village* with around 25 housing units[^], fig._5.13 & 5.14, to be executed by a contractor. These 25 units are planned to be distributed among the newly married villagers who did not benefit from the previous governmental housing phases. The project is named “Qaryit Al-Ġārah Al-Badawiyah” (*Al-Ġārah’s Bedouin Village*) and has been approved by Nafady (2013) that one and a half EGP million is allocated for the construction of this project.



Figure 5.13: Location of the proposed future Bedouin Village (after Google Earth, March 2013)

5.3. SELF-LED HOUSING INITIATIVES

In parallel to the provision of the governmental houses, other self-led initiatives took place. They can be classified into two groups; one is polarized towards the vernacular style, which is referred to as “*The Vernacular Wanna Be*” and another modernized group referred to as “*The Limestone-Brick House*^{[5]⁶”, fig._5.15. They are featured by being by its users without an obligation of a specific spatial configuration or floor area. They are dispersed around *The Village’s* governmental houses in the plain land without legal land tenure.}



Figure 5.14: A preliminary proposed master plan for the future Bedouin Village. (Source: NWCDA 2013)

These successive phases of development resulted in the different typologies of the living



Figure 5.15: Part of the present Limestone-Brick House development is taking place

environments that exist in *The Village*, fig._6.02 which will be analysed in the following chapter.

5.4. FURTHER MILESTONE INTERVENTIONS

5.4.1. THE REHABILITATION PROJECT FOR A PART OF THE OLD ŞĀLĪ

In 2007, a rehabilitation project for part of the old Şālī in *The Village* had been executed and released in 2008. It was part of a comprehensive plan for the sustainable development of *The Village* funded by Shell-Egypt for Petroleum (Anon 2008; Shell in Egypt n.d.). Yet, it is facing operational obstacles due to the recession of the tourism market at *The Village* because of its remoteness and the needed security permits. EQI (Environmental Quality International) was its executive contractor. It had been rehabilitated by the local villagers assisted by experienced master builders from Siwa*Δ. The project had been logistically executed under the supervision of *Maṭrūḥ* governorate and representatives from Siwa City Council (Anon 2008; Shell in Egypt n.d.). The project included the rehabilitation of the market place, the minaret of the old mosque, and the gate, in addition to, the constructing *Marbū'ah*, two service rooms, and a guest room with toilet.



Figure 5.16: The rehabilitated part of the Old Şālī

5.4.2. THE PROVISION OF DOMESTIC PV SYSTEMS

Since *The Village* is not connected to the Egyptian National Power Network, because of its remoteness, it depends in its power provision on the limited amount of power provided by the two power-generator plants it has of 5180 KW/hour capacity (IDSC 2012), fig._5.17. The generators are operated 8 hours/daily (during daytime: from 12 pm till 2 pm, at night: from 6 pm till midnight).

In December 2010, the provision of PV systems for all the 75 houses existed at *The Village* is completed^[6] (NREA 2010; NREA 2011), fig._5.18. Yet, around 24 houses are not provided by the PV panels; because they have been constructed after the completion of the project. The streets have been also provided by 30 solar PV street-lamps (NREA 2010; NREA 2011), fig._5.19. The distribution of these street lamps has been planned in participation with a local committee consisted of the natural leaders of *The Village* fig._5.20. The project also included the provision of additional PV systems for the school, clinic, and the mosque (NREA 2010; NREA 2011).

As observed the domestic PV unit consists of three main parts; 1) Main PV panels on the roof top, fig._5.21 (which should be placed on a proper roof structure to bear its load, and directed towards the best perpendicular sun angle to the south), 2) Indoor power control panel, fig._5.22,



Figure 5.17: *The diesel power-generating unit*



Figure 5.18: *Houses are provided with PV units*



Figure 5.19: *PV street lamp*

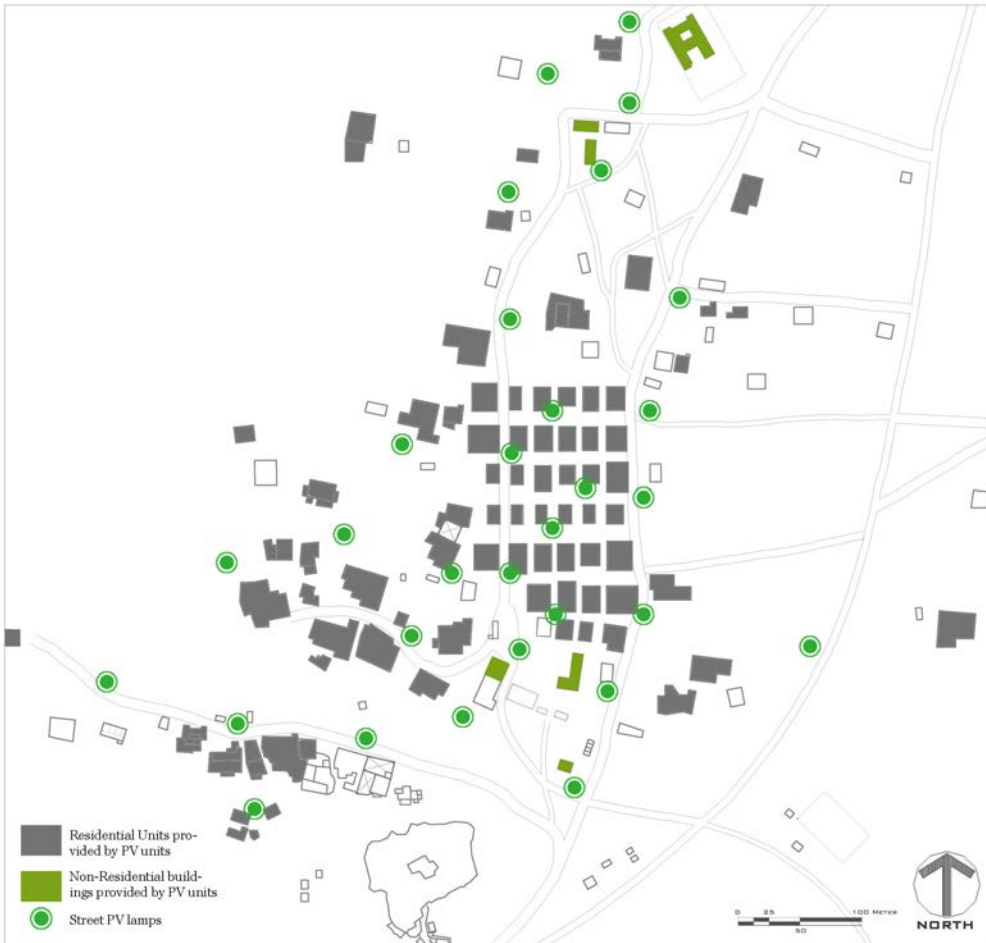


Figure 5.20: Map for the houses provided by the PV units and the distribution of the PV street-lamps (Developed by the researcher based on fieldwork observations and Google Earth aerial maps, March 2013)

3) The charging batteries, fig. _5.23. Accordingly, since its provision in 2010, a new culture for the usage of those panels has been integrated into their lifestyle. The indoor units should not be reachable by kids or unaware family members Δ , in order to avoid any irregularity of its performance^[7]. Thus, this new corner is traced in the analysis of the different living environments in the following chapter; its position and later in more details its pattern of usage and maintenance.

Despite the provision of this PV system has been essential for such a remote and isolated village, the domestic power generated through this system is not sufficient for the increasing demands of the contemporary lifestyle needs.

The capacity of each two PV units, that is provided for a single house, is 424 watt (peak); which is able to power 9 x 11 w energy-efficient lamps and a TV set (or radio) of 60 watt (NREA 2006). Thus, it cannot operate essential heavy load machines such as; a fridge, a washing-machine or a blender. Despite this system is an expensive energy application. Its maintenance cost is limited compared to the average life span of 25 years. It also provides *The Village* with a clean source; of energy 24/7 (hour/days). In the case of proper regular cleanness, it provides a constant capacity of power provision without power cuts. It is also integral with other conventional power systems like the diesel generator.

5.5. QĀRRAT 'UM-ĀŞAĠİR: STATUS-QUO

Having passed through the different development projects, *The Village* in its current situation, comprises of 99 single floor houses (IDSC 2012). They were 88 in 2011 (IDSC 2011) which indicates that the housing sector witnessed an increase of around 89% in one year. *The Village's* urban sprawl is taking place year after a year, since the *Old Şālī* has been abandoned.

Most of *The Village's* landuse is residential; however, it also has educational, health, commercial, cultural and service facilities, fig._5.24. Yet, the infrastructure is in its early phases; neither a water supply nor a sewage system (IDSC 2012) is provided. Nevertheless, there are two main roads



Figure 5.21: Domestic PV unit on the roof top



Figure 5.22: The indoor control panel



Figure 5.23: Indoor built-in corner holding the batteries inside

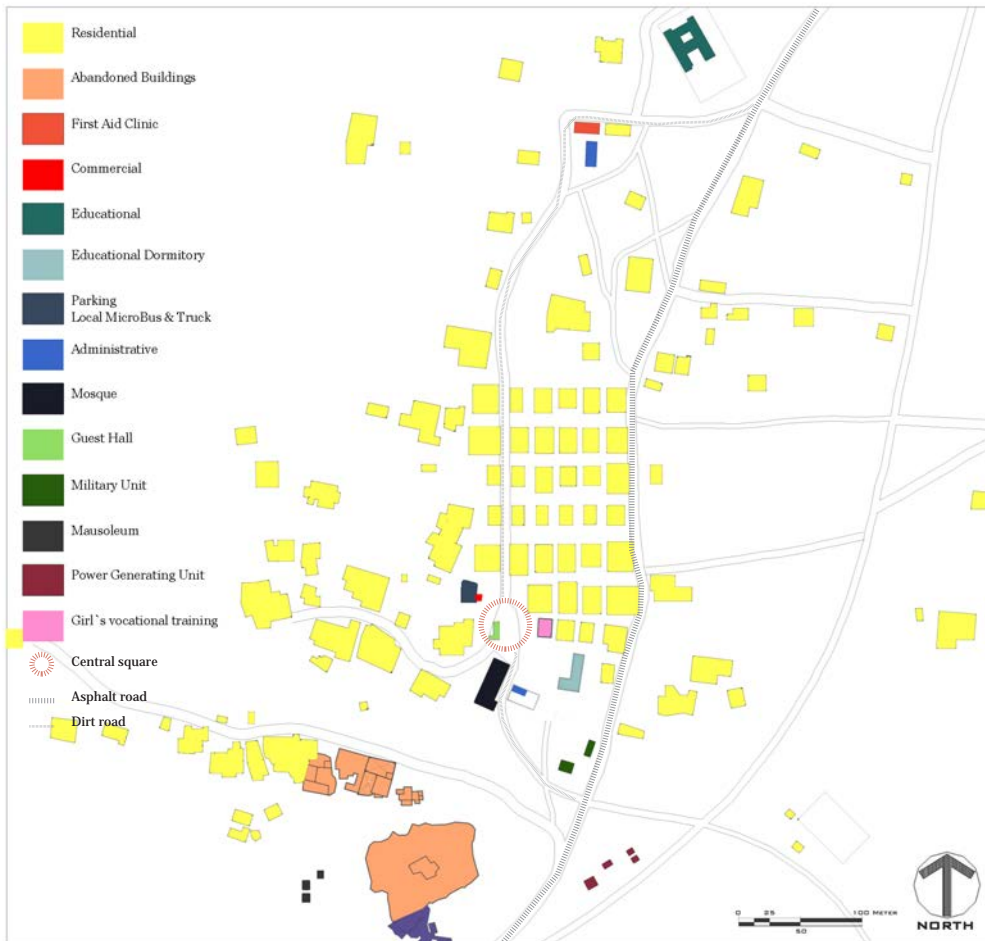


Figure 5.24: Landuse map of The Village

(Developed by the researcher based on fieldwork observations and Google Earth aerial maps, March 2013)



Figure 5.25: The female vocational training centre



Figure 5.26: The school's teachers dormitory

connecting *The Village* to the surroundings; an asphalt sealed one of 4 m width and another dirt road of 8 m width (IDSC 2012). The latter crosses through *The Village's* main central square, fig._5.24 where the school's dormitory fig._5.25 , the guest hall, the mosque and the vocational training centre, fig._5.26 are located.

5.6. FINDINGS AND CONCLUSION

- It is concluded from *The Village's* timeline of housing developments that different six typologies have existed, fig._5.27.
- The story line of these typologies that ended to the present status-quo of *The Village* is told in fig._5.28. Throughout it few lessons are learnt:
 - The governmental post-phases has overcome problems of *Allām Housings* by giving the community the opportunity to build their own houses. It contributed in finding a good fit between the socio-cultural needs of its owners and the available resources provided by the government.
 - The alternatives of the self-led housing initiatives came as a response to the probabilities that surrounding physical environment provided. According to Rapoport's (1976) suggestion of the probabilisim, the physical environment provides possibilities for the choices from the surrounding environment without determining any.



Figure 5.27: Different housing typologies concluded according to the timeline of developments

- The cultural diffusion of technology transfer is in a way beneficial if it has been applied to the limit satisfying the community's needs. As a consequent, this must cause a degree of social change, which might be limited to the change in habits (White 1962 cited in Oliver 2003). Nevertheless, the success and acceptability of the PV system as a technology transfer is based on the awareness from the community of its necessity, and the availability of making it compatible with the survival culture (Oliver 2003).

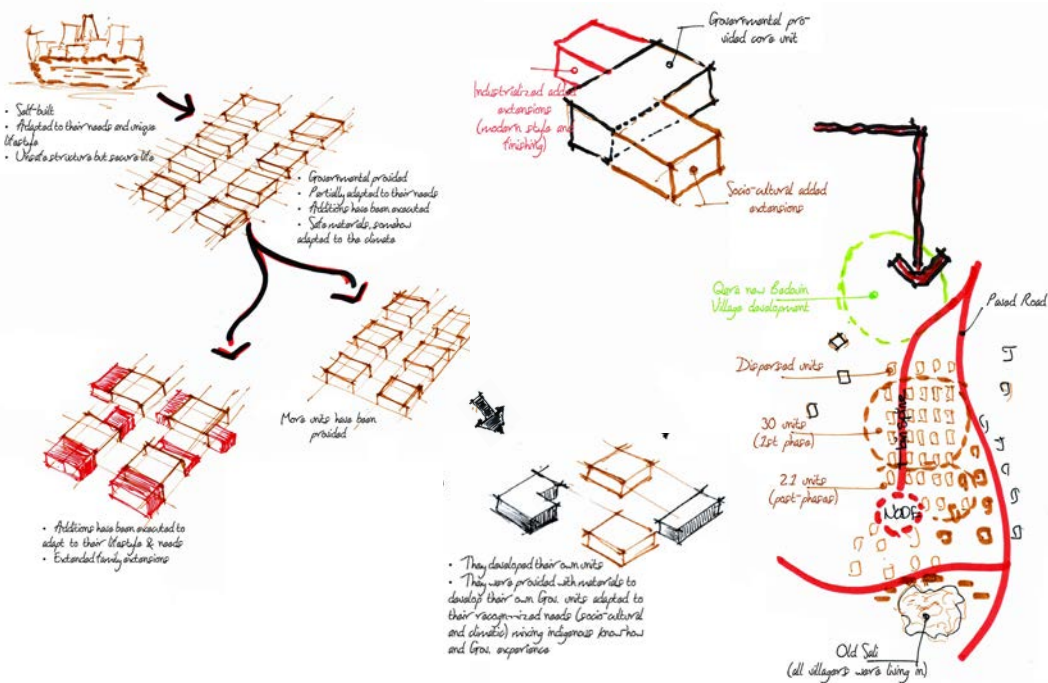


Figure 5.28: A story telling diagram for the process of development in the housing sector during the past four decades till the present status-quo of The Village

CHAPTER FIVE NOTES

1 Currently it is named North-West Coast Development Authority (NWCDA).

2 For reasons on the problems associated with the traditional building techniques, kindly refer to the next chapter: *6.3.3. Vernacular vs. Advanced*, P. 85.

3 Nowadays it is unnoticeable to find them identical neither from the outside nor from the inside. More details on the amendments users executed on them can be found in the next chapter: *6.2.1. Allam Housings*, P. 69.

4 For floor plans and information about the unit design, refer to the next chapter: *6.2.1. Allam Housings*, P. 69.

5 Few of those new houses are inhabited. Most of them are still under construction and are prepared for new couples who are getting to marry.

6 The project has been provided to *The Village* as part of a joint cooperation agreement between the Cabinet of *Maṭrūh* Governorate and IMELS (the Italian Ministry for Environment, Land and Sea) (NREA 2010; NREA 2006). All the materials, equipments and tools have been installed by Genyal Spanish company for clean energy applications (NREA 2010). An Egyptian company was responsible for the transportation of materials and maintenance of the PV system for the first five years of operation.

7 This might cause a pause of not less than one month until applying the regular maintenance check.

* Interview result with representatives from Siwa Town Council and *Qārrat 'Um-Āṣaḡīr* Local Administrative Unit.

^ Interview result with representatives from North-West Coast Development Authority (NWCDA); based in *Marsā Maṭrūh* city and Siwa Oasis.

Δ Interview result with *The Villagers* and the natural leaders.

CHAPTER SIX



QĀRRAT 'UM-ĀṢAGĪR :
THE LIVING ENVIRONMENTS
“Analysis of The Housing Typologies”

6. QĀRRAT 'UM-ĀṢAĠĪR: THE LIVING ENVIRONMENTS

“Analysis of The Housing Typologies”

This chapter explains in detail the different patterns of the living environments in The Village. The Architectural features, house morphology, and building materials are analysed for each housing typology. The reflections of these factors on the socio-cultural and environmental considerations are analysed accordingly. This analysis is based on the findings from the previous chapters. Six typologies of the living environments have been identified based on the fieldwork study, fig._6.02. Participant observation, guided observations and interviews with the inhabitants played an essential role in understanding morphological, socio-cultural, and environmental aspects. The findings of the analysis will point out important factors affecting the living environment at *The Village*. This in turn will help in answering the initial research questions, in addition to, figuring out essential design guidelines for the future architectural developments in *The Village*.

6.1. PATTERNS OF THE LIVING ENVIRONMENTS IN QĀRRAT 'UM-ĀṢAĠĪR

“The Housing Typologies”

As described in Chapter Five; *The Village* has passed through several phases of housing developments. These are classified into two main causatives, after the abundance of the vernacular houses, fig._6.01. Hence, the governmental-led housings are classified into two main typologies; the first phase referred to as *‘Allām Housings* and the subsequent phases, in one group, referred to as *The Governmental Post-housings*. The self-led houses are categorized into two groups according to the building materials and technique they have been built with. The first category is for the usage of the contextual materials, or in some cases, the merger between contextual and modernized materials, which is referred to as *The Vernacular Wanna Be*. The other one is for the usage of the modernized building materials referred to as *The Limestone Brick House*. Additionally the past *Vernacular House* is included although few of those houses are still

inhabited, since most of its owners have moved to the governmental provided units. Furthermore, the proposed *Future Governmental* intervention which will be taking place in few months is considered in order to verify its relevance to both past and present experiences.

These typologies, fig._6.02, are considered merely for the phases of development that *The Village* went through in relevance to the method of the provision for each. Other aspects such as the economic standard or the family size, either a single- or an extended-family house, are not considered for many reasons. Firstly, the economic standard of the villagers is, almost, the same. Differences in the living environments according to the income level are limited; except for the affordability of the higher income families to use modernized materials to build extensions for their houses. Secondly, categorizing the living environments according to the family size will limit the study of the housing typologies. Since most of the self-led are built for the newly married couples. In addition to the existing extended-family houses are built in different building materials and techniques.

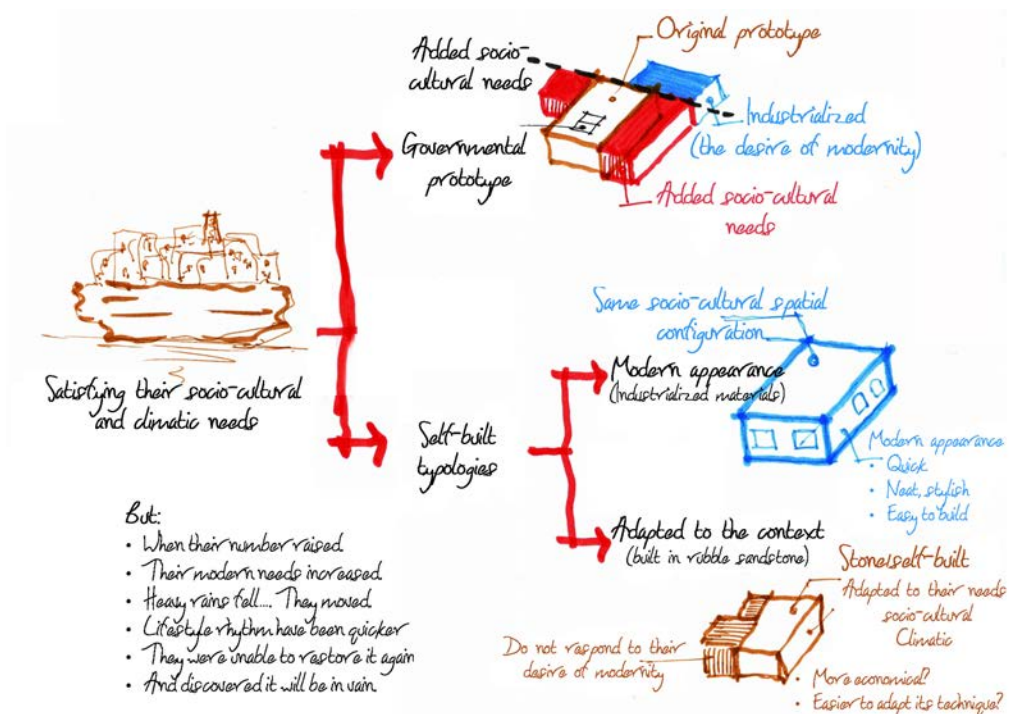


Figure 6.01: An illustrative diagram for the primitive classification of the typologies of the living environments



Figure 6.02: *Map for the typologies of the living environments in The Village*
 (Developed by the researcher based on fieldwork observations and Google Earth aerial maps, March 2013)

This will only reflect the analysis on one aspect; the house morphology, and will not include reflections on the building materials and reasons behind it. Additionally, classifying the living environments according to the phases of the developments reveals causatives of a particular typology and justifies part of the morphological organization of the unit, as reflected in the following analysis.

6.1.1. THE VERNACULAR HOUSE

As observed, and previously mentioned, the old vernacular settlement is, almost, abandoned except for few houses, fig._6.03. Yet, it is possible to investigate one of them, in the vernacular extension surrounding the *Old Şālī* fig._6.05,

with a guided illustrations by one of its former residents. The guided-observation focused on the functional configuration of the house, its relationship to the lifestyle patterns, and the socio-cultural distinction of the residents.

A) The House Morphology

However, this house sample appears as ruins, fig._6.04, it has been observed and told that the house was two floors high. The second floor was built when the elder son was about to marry. As Yousef (2007) told the two floors were to accommodate the extended family needs (Yousef 2007). She added that the smallest Siwan vernacular house must comprise at least; two rooms; one for winter and another one for summer, an entrance lobby “*Maṭlū*”, a courtyard “*Mūriḥ*”, and a traditional toilet “*Ḥūr*” attached with a wet area for hygienic habits. This is similar to the spatial configuration of the discussed vernacular house, fig._6.06.

The house was built in the traditional building techniques and materials by its indigenous inhabitants. It is built using *Karšif* and *Tlaḥt*. Walls are 35-40 cm thickness. The higher the walls is the less thickness it gets, fig._07. It was told that its roofs were built out of palm trunks in the traditional way, fig._6.08. Openings of doors and windows were supported by either a palm or an olive tree trunk, fig._6.09. Yet, there are no traces for the old shapes of the doors or windows designs



Figure 6.03: An abandoned vernacular house in The Village



Figure 6.04: Location of the discussed vernacular house. (Source: after Google Earth, June 2013)



Figure 6.05: The South-western elevation of the discussed vernacular house



Figure 6.06: The ground floor plan of the discussed vernacular house (drawn by the researcher as observed during the fieldwork with some clarifications by its former resident)

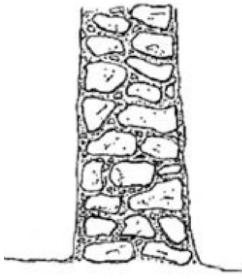


Figure 6.07: Cross section in a Karšif wall thickness showing that it gets thinner with the height (Source: Rovero et al. 2009)

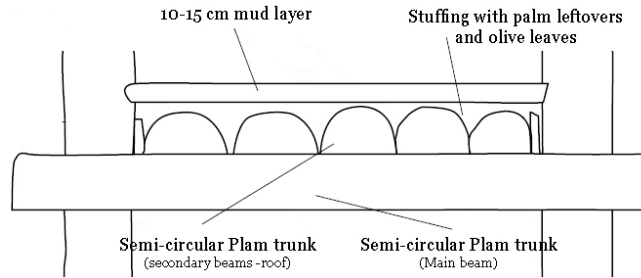


Figure 6.08: Cross section at the typical traditional palm trunks roof (Savolde 2009, 50)

in this house, however, people confirmed that palm and olive trees were used to construct doors, fig._6.11. Windows' design was similar to the Siwan four quartered opening, fig._6.10, agreeing to what (Vivian 2007; Yousef 2007) have both mentioned. It is also worth mentioning that the building had neither foundations nor an outside or an inside plastering.

B) Socio-cultural reflections

Socio-cultural aspects should be considered in the analysis of past and present experiences. This is supported by Dikman (2010) who insisted that the house morphology is a result of a complete phenomenon combining socio-cultural and physical factors. Hence, this typology verifies several aspects of the indigenous living environment of the villagers (socio-cultural and physical factors). Yet, they are reflected clearly and in their original patterns. The floor plan morphology shows the concept of the multi-entrances for purposes of gender segregation and household privacy, fig._6.06. Moreover, in addition to, the traditional service spaces such as; kitchen, 'Iṣṭāḥ-nṭābint, Ḥūr⁽¹⁾,



Figure 6.09: Left: A window opening supported by palm tree trunk from the upper side

Figure 6.10: Right: The traditional window is found in many of the neo-vernacular buildings constructed in Siwa



Figure 6.11: An old door made out of palm tree trunks

and the wet area , the house comprise main spaces for the daily life of its inhabitants. Those spaces are; *Marbū`ah*, the winter-room, bed-rooms; for the parents and for the children. In relatively large houses, such as the discussed one, there are more small rooms/lobbies. Most probably they are used as storage-rooms as also confirmed by Yousef (2007).

By building the extension of the first floor, downstairs *Marbū`ah* was transformed to parents' bed-room and another *Marbū`ah* was built at the first floor. The downstairs *Marbū`ah* (Parents' bedroom) was attached to *Mistāḥ* at the outdoor which was used for drying dates to feed the livestock Δ , this is confirmed by Yousef (2007) as one of the typical Siwan vernacular house features. The informant told that the first floor comprised the new *Marbū`ah*, a lobby space, *Ḥūr*, and two bed rooms; one for the newly married elder son and the another one for the children. As mentioned by Yousef (2007) that in the traditional houses parents used to sleep at the ground floor while children's room is located at the first floor. He mentioned about the staircase connecting the two levels, however, there were no traces for its location^[2]. *Marbū`ah* was furnished with mattresses, mat and *klim*, (Yousef 2007). They also made use of the roof tops for drying dates (Yousef 2007) and sleeping at summer nights Δ .

C) Environmental reflections

The vernacular house looks as a model for the thermal adaptation of the building to the surrounding climatic environment. This is reflected by means of passive design through; building orientation, internal spatial organization and the choice of the building materials.

Since, North-South orientation is preferable for the main façade orientation, in those regions, especially for windows (Givoni 1994), the main facades of the discussed vernacular house are oriented towards North-South, with most openings at the main facades and few at the East-West directions. This reduces the increase of the indoor temperature by the unwanted solar penetration (Givoni 1994) and reduces the thermal loads on the building's envelope, thus contributes in providing a better indoor thermal comfort. On another hand, it is reflected on

the internal spatial organization of the house. *Marbū'ah*'s openings are directed towards North along with the most usable spaces at the first floor, this plays a good role for the air ventilation. However, windows are narrow, in order to avoid heating up the indoor air temperature by the hotter outdoor air (Givoni 1994). In addition the compactness of the house, since, the surface area of the external envelope is relatively small comparing to the house floor area, which according to Givoni (1994) reduces the heat gain from the outdoor temperature.

The winter room is heated by convection. It is an interior space built in high-mass with no openings, provided with small *Kānūn. Ḥūr* is also positioned at the southern side of the house. Its opening is directed towards South in order to take away the smell with the ventilation out of the house, fig._6.06. Furthermore, the inhabitants used to sleep on the roof of the first floor at summer-nights Δ, by the emission of long heat radiation which indicates the application of the nocturnal convective cooling via the deep night sky effect.

The house is built in the traditional contextual materials, which reflects the self-sufficient know-how technique that the villagers developed along years. Using *Karšif* and *Tlaḥt* for the wall construction developed a high-thermal-mass to protect the indoor space from the solar radiation. The high-mass wall absorbs heat during daytime from the warm outside air, making the indoor surfaces cooler than outdoor in the forenoon and warmer in the afternoon and evening (Givoni 1991). In this way the indoor temperature could be maintained below the outdoor level, in summer-times, in case of, the absence of ventilation, by using narrow windows (Givoni 1991). Since *Karšif* and *Tlaḥt* are salty materials, absorb humidity, and release it to the indoor during dry times. Thus, it provides a comfortable humid environment at the summer daytimes and warm spaces at night and winter-times.

6.1.2. 'ALLĀM HOUSINGS

A sample house unit of '*Allām Housings* is analysed in its original form, fig._6.12. In addition to, analysing the users' interventions modified on it as a way to adapt their lifestyle requirements. Further detailed analysis on these

amendments and the behaviour patterns in each home zone is explained at the end of this chapter.

A) The House Morphology

The nucleus core of 'Allām Housings consist of; two bedrooms, a kitchen, a toilet and a central courtyard; as observed and told*Δ, fig._6.13. Yet, it is observed totally different after the modifications the villagers have added upon. According to the explanations given by its inhabitants for the step by step amendments, one concludes its two main reasons; either to adapt it to their lifestyle requirements or, as they trended in the Şālī life, to satisfy the needed spaces for the extended family members, fig._6.14. Other observed limited amendments were applied to supplement the contemporary needs of its inhabitants. in an area of 144 m2

This prototype was built in a mixture of contextual and non-contextual, but not the traditional building materials. Walls are built in rubble sandstone and *Tlaḥt* (Ṭflah) with 50 cm thickness adapting the wall-bearing system of The Vernacular House. However, roofs are built in mechanized fine wood panels, fig._6.15. It might be reasoned by saving efforts, time, and the limited palm tree resources in *The Village*, with the amounts needed for the mass production of the thirty housing units. It was built without foundations. Doors and window openings were provided in wooden frames different than the traditional window type, fig._6.16 & 6.17.



Figure 6.12: Sample house unit of 'Allām Housings

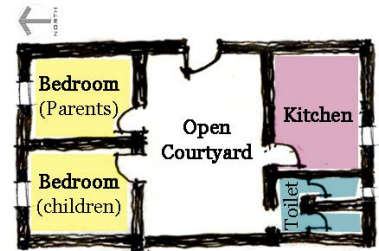


Figure 6.13: The nucleus core prototype of 'Allām Housings (The first thirty governmental provided units)



Figure 6.14: Ground floor plan of sample unit with its reasoned amendments (Read: the original core house, Blue: the added spaces by users, Green: the extension added to accommodate the extended family needs)

B) Socio-Cultural Reflections

The nucleus core of this prototype did not afford most of the traditional house concepts which *The Villagers* grown-up upon Δ . The house neither afforded the gender segregation concept through providing more than one entrance, nor provided a living space to gather the family members. However, a central courtyard was provided; as the *Mūriḥ*, in addition to, providing the toilets in the separated wet and dry *Hūr* zones.

-Adding lifestyle requirements: *Marbū'ah* is observed as the essential and firstly Δ added space. It provided both; a temporary space to gather family members, and to receive visitors, if any, with a separated outdoor entrance. In addition to a corner from the kitchen space is transformed to the traditional stove '*Iṣṭāḥ-nṭābint*. The private entrance of the house is enclosed with palm leaves trelis from the outside fig._6.18 . It is also repeated in the same pattern in most of the house typologies.

-Adding extended family needs: One or two bedrooms are constructed for the increase in the family members. Since, it is considered a small housing unit for the average of eight members* Δ for most of the village's families. In addition to, extensions supplemented for sons if getting married. In this case, either a room, or a suite^[3], or a complete house unit with its own *Marbū'ah* but shared services is added Δ . The latter case takes several years to be completed, and in most cases, the first two options are the primary situation of this final one Δ , unless the couple moves to a new house after their marriage.

-Emerging contemporary needs: In most cases in '*Allām Housings*, as observed, the PV system equipments are added in the constructed *Marbū'ah* ; its indoor equipments are installed in a built-in brick corner and high unreachable control panel.

C) Environmental Reflections

The thirty units of '*Allām Housings* have been oriented towards the North-South direction with its main facades. This to avoid the undesirable solar radiation falls in summer on the eastern and western facades. The most usable spaces

are positioned at the Northern façade, such as the two bedrooms, to allow for ventilation from the openings positioned at its facade. However, the large openings might cause an undesirable solar penetration at summer daytimes, (Givoni 1994), results in an elevation at the indoor air temperature. Thus, benefits in making use of the preferable wind directions coming from North, and lessening the direct solar radiation and heat gains on the most usable spaces, through placing them at the Northern façade.

Using the rubble sandstone as a construction material has been an appropriate solution to the problems associated with *Karšif* as a salty dissolvable and humid absorbing material. Constructing thick Rubble sandstones and *Tlaht* walls (50 cm), provided a high-thermal-mass similar to *Karšif*, to protect the indoor space from the solar radiation minimizing heat gains at the indoor spaces. *Tlaht* also provided an atmosphere to absorb humidity and release during dry daytimes. Hence, a kind of passive design thermal comfort is afforded at the indoor spaces of the main core unit, however, its environmental performance has been changed after the amendments people executed.

6.1.3. THE GOVERNMENTAL POST-PHASES

The users' interventions are again analysed on one of The Governmental Post-phases, fig._6.19; in order to juxtapose the interventions



Figure 6.15: *Wooden panels are used for roofing in the original prototype structure*



Figure 6.16: *Sample window frame in 'Allām Housing*



Figure 6.17: *Sample entrance door in 'Allām Housings private entrance*



Figure 6.18: *Palm leaves trelis enclosing the house's private entrance*



Figure 6.19: Location of the discussed sample of the Governmental post-phases (Source: after Google Earth, June 2013)

on the both models and analyse their manifestations and causatives.

A) The House Morphology

The nucleus core of this typology was constructed with the same functional organization of 'Allām Housings, but in larger bedroom areas increased to 216 m²*. Inhabitants executed modifications for purposes of satisfying their lifestyle requirements and the extended family needs, in addition to, their desire for the luxurious expression of modernity, fig._6.20. The resulted spatial configuration satisfy most of their inherited lifestyle requirements and mores, fig._6.21. Yet, those modifications were constructed using different building materials, fig._6.23, which were affordable for the users at the time of construction.

B) Socio-Cultural Reflections

House has multi-entrances, and separated *Marbū'ah* with its toilet facilities, in addition to a private living room for the family, to ensure enclosure. Children are gender segregated in two bedrooms, apart from parents' room. An outdoor space is constructed to function as the traditional *Misṭāḥ*, in addition to the indoor *Mūriḥ* (courtyard). Those are used for celebration in case of a newborn or marriage.



Figure 6.20: Illustration for the users' interventions on the nucleus governmental unit (blue: representing lifestyle additions, black: for the expression of modernity) (Floor plan is drawn by the researcher as told by its inhabitant)

Marbū'ah was constructed with limestone bricks as the inhabitants perceive it as an expression of luxury and modernity because of the neatly finished surfaces. Other rooms were constructed

in the available sandstone. Roofs were constructed either with palm trunks or palm reeds. However, in this particular house the roof of the storage room has been heavily insulated, hence it is an important room in case of any rains, which should be wisely protected fig._6.22.

C) Environmental Reflections

However, in hot arid climates it is preferable to build a compact mass (Givoni 1994), this house after being modified by the users expresses horizontal expansion. This results in a higher exposure of its exterior surfaces to the solar radiation which in turn increases the internal heat gain. The bedrooms and *Marbū`ah* are oriented towards North in order to benefit from the preferred wind direction. Although the living space benefits, in winter, from the direct heat gain on the southern façade, it is not desirable in summer, unless using a high-thermal-mass or providing means of cooling ventilation only in summertimes.

House walls are built in high-thermal-mass sandstone walls (50 cm thickness). This is beneficial for the indoor thermal comfort of each space. However, *Marbū`ah* is constructed in limestone brick walls (15 cm thickness), which did not provide a proper protection (time-lag) for the heat gains on each façade. Nevertheless, another beneficial point, which might lessen its effects, is the white external surface colour. It is preferable as a reflective colour in order to lessen the thermal

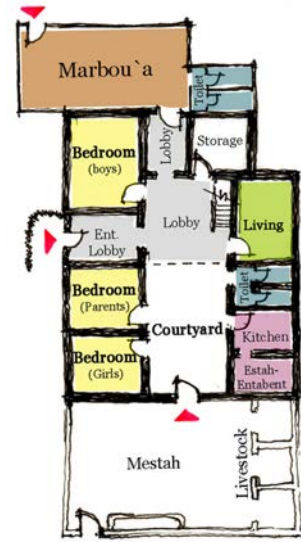


Figure 6.21: The discussed sample after executing users' interventions (drawn by the researcher as told by its inhabitant)

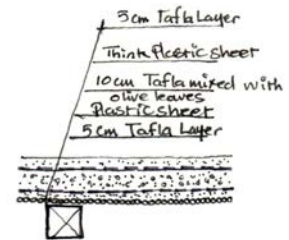


Figure 6.22: Cross section at the roof layers of the storage room

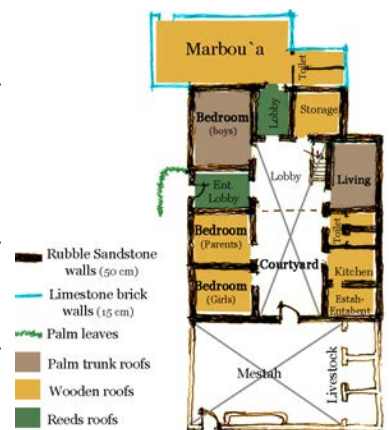


Figure 6.23: Illustration for wall and roof construction materials (drawn by the researcher as told by its inhabitant)



Figure 6.24: Location of the discussed Vernacular wanna be. (Source: after Google Earth, June 2013)



Figure 6.25: Façade of the discussed sample



Figure 6.26: Separated living and service zones

loads on the indoor spaces (Givoni 1994).

6.1.4. THE VERNACULAR WANNA BE

Present needs are also applied in a compromised approach polarized towards the vernacular model, fig._6.24 & 6.25 & 6.27. The discussion of one of those trends is meant to provide further understanding of the dilemma of present needs vs. inherited culture.

A) The House Morphology

This is the only prototype where the service and living zones are separated clearly fig._6.26. All the family's needed spaces are provided at the living zone; a parent's bedroom, two bedroom (for gender segregated children) an apartment zone for th new couples, *Marbū'ah*, and a living space. In addition, storage room, kitchen, *'Iṣṭāḥ-nṭābint*, *Mūriḥ*, toilets (wet/dry), are included in the service zone.

The house is mostly built in sandstone walls except for some added spaces. Roofs are different in each space, according to the affordability of materials fig._6.28 & 6.29.

B) Socio-cultural reflections

Separating the house in these two zones allowed access between them both through a door case fig._6.27. They have provided more than one entrance for each zone, in addition to an outdoor space for celebrations along with another separated zone for growing livestock. Provided two toilets, fig._6.30 & 6.31, a traditional wet/dry one

and another modern single zone. Two additional corners exist for practicing their daily lifestyle and providing contemporary needs; the washing basin corner fig._6.32, and the PV corner with the built-in battery corner and control panel fig._6.33 .

C) Environmental reflections

In terms of house orientation like in the other typologies it is directed in North-South orientation. *Marbū'ah* and the bedrooms are oriented to the northeastern façade. Nevertheless, the building is still horizontally expanded, not compacted,

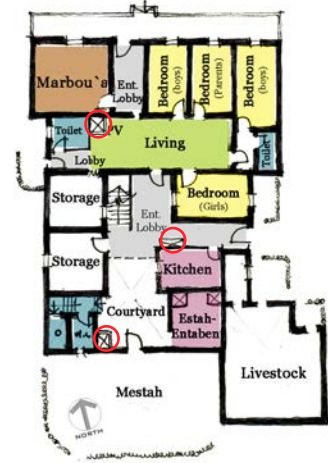


Figure 6.27: Floor plan for the discussed sample



Figure 6.30: *Hūr* (the traditional dry toilet)



Figure 6.31: Toilets' contemporary expression

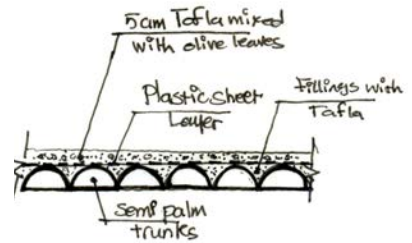


Figure 6.28: Typical present palm roof covering



Figure 6.32: Washing basin corner



Figure 6.33: PV interior corner

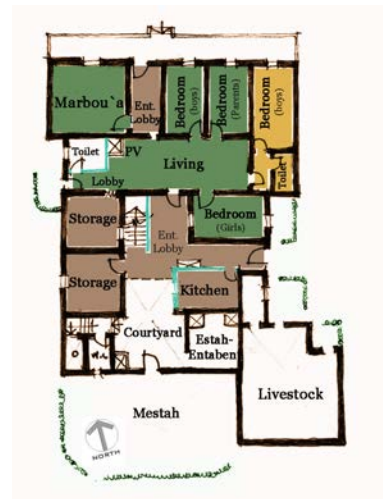


Figure 6.29: Illustration for wall and roof construction materials (The same colour key: fig._6.22)



Figure 6.34: Location of the discussed Limestone-Brick house. (Source: after Google Earth, June 2013)

which allows for more solar radiation . External walls are built in rubble sandstone thermal-mass of 50 cm thickness, which minimizes indoor heat gains and provides higher indoor temperature than the outdoor at nights. In addition, using *Tlaht* as a pasting material along with the thermal-mass provides an indoor thermal comfort, not only by minimizing the indoor heat gains but also, providing an indoor humid comfort atmosphere. On the other hand, constructing part of the indoor spaces with limestone bricks does not disturb the indoor comfort from an environmental point of view, since the walls are indirectly affected by the indoor heat gain.

6.1.5. THE LIMESTONE-BRICK HOUSE



Figure 6.35: The discussed Limestone-Brick house

Studying one of the recently emerged Limestone-brick houses is important in order to position the inhabitants' present needs comparable to the inherited cultural ones, fig._6.34 & 6.35. This is intended to re-track it in a compatible neo-vernacular living environment.

A) The House Morphology

The discussed sample is not yet inhabited; however, it is completely constructed. It is built to accommodate two newly married couples into two attached apartments with shared services and *Marbū'ah*, fig._6.36. The house is modern, yet vernacular; built in modern materials and construction methods; however, its interior functional



Figure 6.36: Analytical sketch showing the double attached apartments in one house

organization is still respecting the villagers' life-style mores, fig._6.37.

Wall bases are *Qišiyah*; built in *Āşfā* sandstone and cement mortar, fig._6.38. Interior walls are 15 cm thickness and 30 cm for the exterior walls. They are built in limestone-bricks plastered with cement mortar, from outside and inside. Roofs are constructed in wooden panels or reeds, fig._6.41 & 6.42. Door and window openings are wooden frames such as *Şiş* windows, fig._6.40 & 6.43. Other imported design features started to emerge in this typology such as; the semi-circular arches, arcade and the recessed entrance, fig._6.39.

B) Socio-cultural reflections

Each apartment's zone of the two apartments in this house consists of a bedroom and its toilet facilities, additionally one of them is attached to the *Marbū'ah*, which is used by both families.

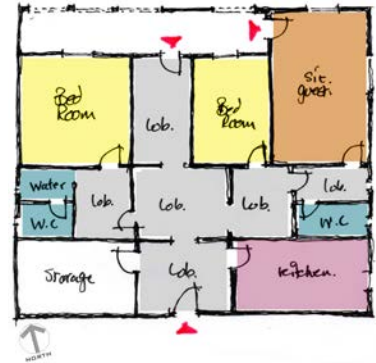


Figure 6.37: Floor plan for one of the modern Limestone-brick houses



Figure 6.39: Imported features started to emerge in this typology



Figure 6.40: *Şiş* wooden frame



Figure 6.41: Wooden panel roof

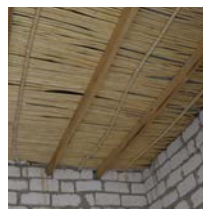


Figure 6.42: Reeds roof



Figure 6.43: Wooden doors

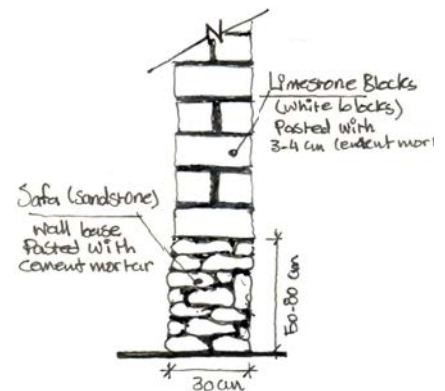


Figure 6.38: Wall section showing *Qişiyah* and the external limestone brick wall

Circulation spaces (lobbies) separate between the two apartments. Since the two families are an extended family root, house services are shared between the two apartments. Concept of the multi-entrances is also applied.

The house design applies most of the vernacularly inherited concepts. However, it is built in different industrialized materials, such as; the multi- entrances, *Marbū'ah*, storage room, and toilets even if using modern lavatories. Because the house is not yet inhabited part of the socio-cultural developments is not yet clear.

C) Environmental reflections

People living in those houses built of limestone brick are aware that it does not afford them thermal comfort inside their houses and that it is not compatible with the surrounding harsh weather Δ . They use fans inside the living space of the house, but this is not affordable as well, since, power supply is limited in The Village. For the same reason air conditioners are not applicable^[4], until present days, by any means there.

Directing the most usable spaces; *Marbū'ah* and the two bedrooms, to the northeastern direction, allow for the best usage of the preferable North winds. However, this might cause an undesirable increase in the indoor air temperature (Givoni 1991; Givoni 1992).

Nevertheless, building the exterior walls in 30 cm limestone bricks provide a thermal mass, but not as effective as *Karšif*, because of the difference in the convective heat transfer coefficient (Givoni 1991). On the other hand, using limestone as a reflective white material can significantly minimize the solar gain through wall (Givoni 1994). In addition, using *ŞiŞ* frames contribute in providing better indoor ventilation by allow for wind penetration and prevent direct sunlight.

6.1.6. THE FUTURE GOVERNMENTAL PROTOTYPE

The proposed future governmental prototype is analysed in order to position its situation from satisfying the current needs, villager's lifestyle and providing solutions for problems of the previous governmental housings fig._6.13 & 6.44 & 6.45.

A) The House Morphology

The prototype provides possibility for extensions, considering in its design the needed spaces that people added at the former prototype^ fig._6.46. The prototype will be built similar to *The Village's* modern limestone brick house. Walls will be built with limestone bricks (15 cm thickness) with *Qišiyah* bases (NWCDA 2012). It will be plastered with cement from indoor and outdoor. Roofs will be constructed out of wooden panels (NWCDA 2012). Openings will be modern wooden frames like the Limestone-Brick typology with *Şiş* windows (NWCDA 2012).

B) Socio-cultural reflections

In the proposed design after extension, it provides two entrances in addition to *Marbū'ah* space. On the other hands toilets are proposed to be provided in modern lavatories without separation of wet/dry zones fig._6.45.

C) Environmental reflections

Considering north orientation for the units in general and the most usable spaces in particular had not been considered in the urban design on the *Future Bedouin Village* fig._5.14. In addition, building the walls in 15 cm limestone brick without providing a high-mass at the outdoor skin might raise the indirect solar gain at the indoor spaces, unless, it is provided by an isolation layer.

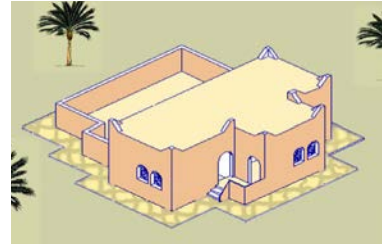


Figure 6.44: Perspective view for the proposed unit at the future Bedouin Village (Source: General Administration for Project, NWCDA, Maṭrūh)



Figure 6.45: Above: Floor plan for the proposed future governmental prototype. Below: The suggested future expansions (Source: General Administration for Project, NWCDA, Maṭrūh)



Figure 6.46: Exterior facade for one of Allām Housing after users' interventions

6.2. SAMPLE 'ALLĀM HOUSINGS: FURTHER ANALYSIS



Figure 6.47: Location of the discussed sample unit. (Based on Google Earth, 2013)

The analysis focuses mainly on the hierarchical adaptation of the users on the core unit, in one of 'Allām Housings, fig._6.48 & 6.49 & 6.50. in order to satisfy their cultural and social needs. Moreover, adapting the family's growth to apply the extended family needs and making use of its spaces.

This sample house has been transformed into an extended family house. The house is owned by the husband of *The Village's* midwife. It is located to the west of the second row in 'Allām Housings block, fig_6.47.



Figure 6.48: Plan for the spatial configuration of the original house core



Figure 6.49: Plan for the spatial configuration of the first additional constructed part



Figure 6.50: Plan for the spatial configuration of the whole house with its current situation after the modifications

6.2.1. THE HIERARCHICAL CONFIGURATION DEVELOPMENT

The hierarchical development of this unit went through three phases fig._6.14. The following is an analysis for the manifestations, the motivations and reasons behind these changes and its consequences on the adaptability of the indigenous culture to their homes. This analysis is based on the story told by the inhabitants of the house and the researcher's observations during the participant-observation fieldwork.

6.2.1.1. *The original core house*

At the beginning one of the two rooms was allocated for parents' and the other one for the children to sleep in at night, but a living space during daytime. The kitchen has been also amended by adding '*Iṣṭāḥ-nṭābint*, fig._6.56 & 6.57, which they used to have in their vernacular houses.

They did not perform much changes on toilets because it was originally provided in wet/dry zones, fig._6.54. They also did use the central courtyard as a circulation space, in addition to use it to dry clothes, fig._6.60, and sometimes, for rearing livestock.

6.2.1.2. *Adapting lifestyle and socio-cultural needs*

With the growth of their social needs, and the necessity to adhere to the inherited rituals, additional spaces were constructed, fig._6.49. The applied concepts for the house privacy, gender segregation and added a living space apart from the children sleeping room.

This started by constructing an additional *Marbū'ah*, which has been transformed into a living space later on, fig._6.53. This space was accessible from the outside without the need to enter the house itself not to harm the inviolability of the female household. In a later stage they constructed an additive larger *Marbū'ah*, fig._6.52, and an entrance lobby as a circulation space between the former and the new *Marbū'ah*. When these additional spaces had been constructed, two entrances were provided. The private household entrance has been enclosed by palm leaves trellis as it is common in *The Village*.

6.2.1.3. *Accommodating the extended family needs*

The family was satisfied by the last stage of amendments until their elder son planned to get married. They constructed the second-half of the house in the form of an attached apartment for the new couple. This new apartment shared services (Kitchen, *'Iṣṭāḥ-nṭābint*, toilets, and storage) with the whole extended family fig._6.50, and had a transitional space to move between the two parts, fig._6.59, in addition to another internal courtyard, fig._6.55.

6.2.2. ANALYSIS OF THE HOUSE IN ITS CURRENT SITUATION

6.2.2.1. *Socio-cultural reflections*

“Socio-cultural characteristics of the residents do not, by themselves, determine the spatial organization of activities in the home. The distribution of activities within the home reflects the extent to which the design of the “home” allows people to fulfil their social and psychological needs in a way that fits their lifestyle and priorities.” (Eid & Shehayeb 2006: 155). Therefore, villagers worked on adapting their homes to fit with their lifestyle requirements. The available final spaces allowed them to practice their contemporary lifestyle in adherence to their inherited rituals. Receiving guests and sleeping have been adapted to the gender segregation concept. Cooking, eating, talk gatherings, handcrafting and other daily life activities are allowed to be performed in groups like the way they traditionally rooted. The technological devices have also been integrated into their traditional life, such as TVs, fig._6.58, and the PV corner, which they favoured its existence after having experienced its advantages. Accordingly, they adapted their habits to regularly clean and maintain its devices (outdoor and indoor). It has been integrated into *Marbū‘ah* space in this example, fig._6.52 & 6.61.

6.2.2.2. *Environmental reflections*

House design and morphology: the horizontal construction of additional spaces affected the building’s compactness. It has affected the building layout and orientation as well, which resulted in larger East-West facades. This caused higher intensities of conductive heat gain to the indoor spaces. However,



Figure 6.51: Children's Bedroom



Figure 6.52: House main Marbū'ah (two doors: entrance and another one to inside the house)



Figure 6.53: Interior of the family's living room



Figure 6.61: PV internal control panel



Figure 6.54: Toilet is separated into wet/dry zones



Figure 6.60: Drying clothes in the central courtyard



Figure 6.55: Another internal courtyard



Figure 6.59: Transitional lobby space between the two parts of the house



Figure 6.58: Marbū'ah of the extended part of the house

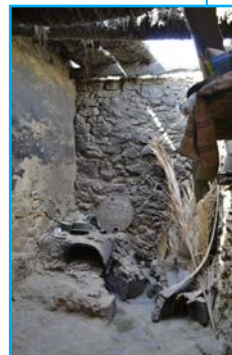


Figure 6.57: 'Iṣṭāh-nṭābint (added traditional cooking corder)

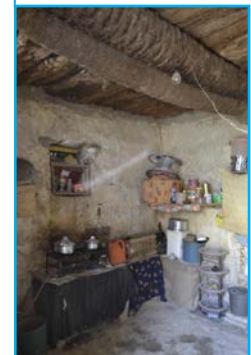


Figure 6.56: The house Kitchen

orienting the most usable spaces towards north contributed in providing indoor comfort ventilation. The added spaces has been constructed in high thermal-mass (50 cm thickness) of sandstone walls pasted with either *Tflah* or cement mortar for a neater finishing. This provided an affordable indoor thermal comfort.

Passive cooling techniques: supported further indoor comfort. Using the internal courtyard space to dry clothes provided daytime comfort ventilation due to the indirect evaporative cooling effect. In addition to the shading on the outdoor facades, this is caused by planting palms in the outdoor spaces. This decreased the solar heat gain on the external building envelope.

6.3. FINDINGS AND CONCLUSIONS

6.3.1. ON THE OF THE SOCIO-CULTURAL LEVEL

Cultural differences between people living in different geographical locations lead to different expectations in their houses (Dikmen 2010). Therefore, the analysis in this chapter revealed common modifications performed on the governmental provided prototypes in order to adapt them to the village's lifestyle requirements. These modifications included 1) Transformations of existing space functions, 2) Building additional spaces, and 3) Integration of technological devices into home spaces.

6.3.2. ON THE ENVIRONMENTAL LEVEL

The villagers succeeded in achieving indoor thermal comfort in their traditional house environments through making use of the available contextual materials, and applying passive design strategies. This came as a result of their deep understanding of the village's climatic conditions along with the properties of the available materials in their context. However, this experience started to be ignored by substituting it with the desire of modernity and an easier construction process.

The usage of air conditioners in the newly emerged typologies was not

observed because of the limited power provision in *The Village* in addition to the non-affordability of purchasing AC's. However, using fans is widespread in *The Village*, which is reasoned by the lack of proper passive solutions; either because of the house morphology or the building materials.

6.3.3. “VERNACULAR VS. ADVANCED”

Although the vernacular materials proved better environmental responses in *The Village*, it faced constructional and technical limitations, such as; 1) The non-resistance to heavy rain occasions, 2) The need for regular maintenance for serious cracks at the critical parts such as the corners and joints, 3) The longer construction time needed (not less than two weeks to build the walls of 4x4 m² *Karšif* room Δ). In addition to the number of the needed talented labours, 4) In nowadays calculations, the traditional building technique costs more than building with the modernized/industrialized materials*^Δ.

However, on the other side, skeleton structures do not yet exist in *The Village*. However, villagers developed their own way of building with the limestone blocks after rethinking building with *Karšif*. Thus, an imported yet different architectural character is starting to be emerged in *The Village*'s architectural style, fig._6.62. Especially after the government paused the provision of housing units until the proposed future plan comes to reality.



Figure 6.62: Building with the Limestone bricks is being emerged in *The Village*'s architectural style

6.3.4. GENERAL INTERPRETATIONS AND INSIGHT

6.3.4.1. The villagers' perspective

The villagers' aspiration of the modern life guided them to import fragmented elements from other cultures, which affected both the design feature and the choice of the building materials that provide them luxurious homes. They believe building with industrialized building materials is more affordable than building with the traditional building techniques and materials. Well-trained labours are hired for high rates, however, building with the industrialized materials is faster, and provides them with neat plastered walls and floors. Furthermore, their aspiration is limited to the available resources in their remote village, and their inherited cultural identity that they are still maintaining.

6.3.4.2. Governmental representatives' perspective

The design, facilities, and floor area of the provided governmental units are limited to the budget allocated for a particular phase of development. This is decided on the bases of what provides a higher number of units with the minimum cost that afford the villagers a human life in their homes. The governmental Bedouin prototype is developed since it is previously provided, before 1980's[^]. The same prototype design is provided to all Bedouin villages in Egypt[^]. The design of the housing units is not regularly studied according to the contemporary socio-cultural and lifestyle needs of the villagers. Accordingly, essential lifestyle needs are not fulfilled in the provided housing units, except for the self-built phases. In most cases, architects of NWCDA (and other responsible authorities) must abide by the tight regulations of the prototypes provided by the Ministry or the higher authority and the limited budget allowance. Usually, minor changes are only accepted if the architects believes in doing it.

6.3.4.3. Researcher's perspective

The architectural style of The Village is valuable component that should be preserved and maintained. In the present developments, people are treating the outer skin of their homes just for the homogenous look of their context. The

essence of the valuable contextual materials is ignored. *Karšif* is a rich natural, reusable material which is exclusively used in Siwa Oasis and the surrounding communities. Further research to come up with solutions for its adaptation losing its challenging characteristics is still needed. On another side, using the PV systems for the power provision in The Village is an intelligent solution to make use of the renewable clean sources of energy in such remote area and to provide its community with one of their contemporary needs.

CHAPTER SIX NOTES

1 For detailed information on the traditional features of *The Village's* house, refer back to; Chapter Four, section: 4.7. Conclusion and Architectural Reflections, p. 39.

2 This is the reason it was not possible to identify the spatial organization of the mentioned spaces in the first floor. However, the informant pointed out that the upper *Marbū'ah* with the two bed rooms were in the north direction.

3 Or as they call it *Şqqah*, which is a bedroom attached to a toilet.

4 Limitations of the power provision in *The Village*, refer back to Chapter Four, section: 5.4.2. The provision of The Domestic PV System, p. 53.

* Interview result with representatives from Siwa Town Council and *Qārrat 'Um-Āşaġīr* Local Administrative Unit.

^ Interview result with representatives from North-West Coast Development Authority (NWCDA); based in *Marsā Maṭrūḥ* city and Siwa Oasis.

Δ Interview result with *The Villagers* and the natural leaders.

CHAPTER SEVEN



DESIGN GUIDELINES FOR THE RESIDENTIAL DEVELOPMENTS

7. DESIGN GUIDELINES FOR THE RESIDENTIAL DEVELOPMENTS

This chapter is an attempt to develop design guidelines for the governmental institutions, private developers, self-led initiatives and also researchers, in order to increase the chances of success for the future architectural developments in *The Village*. It is also meant to come up with integrated compatible neo-vernacular built environment that integrates contemporary needs of the villagers with the inherited lifestyle patterns, and adapts the emergence of the highly-advanced-techniques with the low-tech ones. Hence, those guidelines are presented into two groups; the spatial configuration of the house, and the environmental adaptation to the context, followed by a concluding insight through the different interpretations. The discussed guidelines herein are based on the previous analysis of the different living environments, along with the fieldwork survey in *The Village* conducted through interviews and community meetings with the villagers and natural leaders, in addition to the experimental hands-on construction in Siwa Oasis.

7.1. GUIDELINES FOR THE SPATIAL CONFIGURATION OF THE HOUSE

Through the previous analysis defined functions were configured essential, for the villagers, in the living environment of *The Village*. Accordingly, part of them is defined as main spaces for the construction of a new house, and others for the house extensions.

7.1.1. A NEW HOUSE: MAIN SPACES

Based on the previous accumulative analysis of developments and living environments, particular spaces are found to be compatible with the villagers' lifestyle patterns, if designed in a proper way, fig. _7.01:

- Multi-entrances: For the gender segregation purposes and house privacy, house should have, at least, two entrances separating the guests/male zone and the private/female zone.

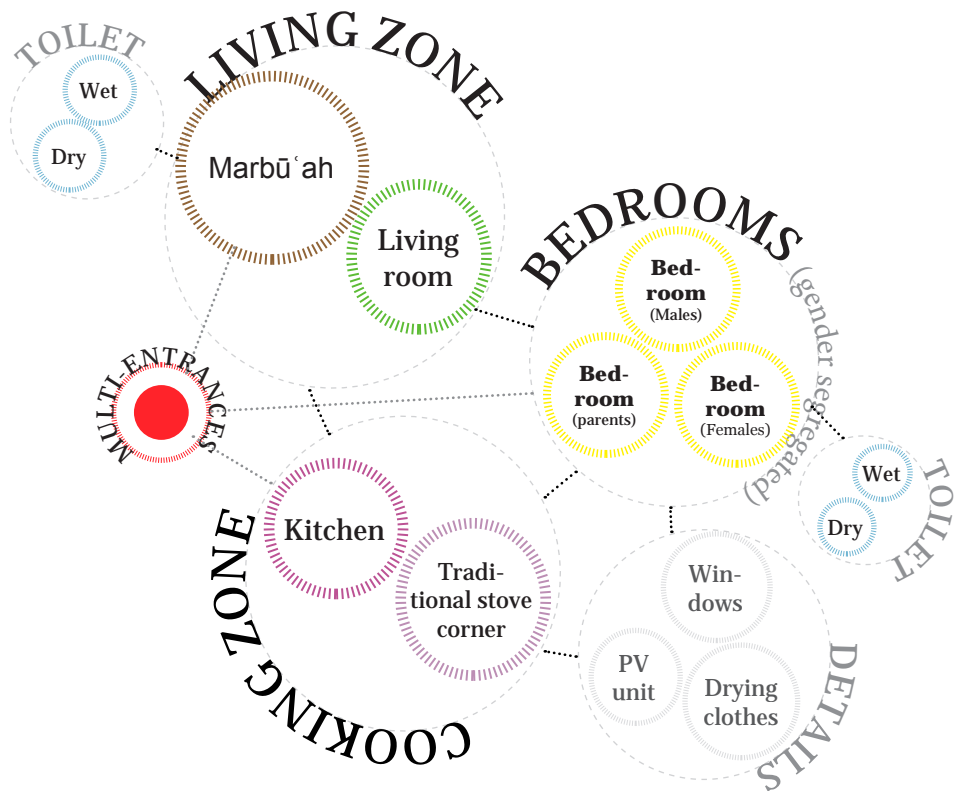


Figure 7.01: A diagrammatic illustration for the essential functional configuration and zoning

- Living spaces:
 - Marbū'ah attached to a toilet and a rest corner or a transitional space, is required for receiving male and foreign visitors.
 - Private living space for family gathering and female handcraft practicing during daytime is needed. This space compensate for the family gatherings during winter-times in the winter room.
- Bedrooms: A minimum number of two bedrooms; one for parents and another for children. In case of a third one, gender segregation concept for the children is adapted.
- Cooking zone: One main storage space close to the kitchen. Cooking corner might be provided with a traditional stove corner, to be used in cases of celebrations or preparations for a banquet.



Figure 7.02: *Drying clothes is taking different shapes in The Village's living environments*

- Outdoor spaces: An outdoor or a courtyard space for occasional celebrations, in addition to another outdoor space for livestock.
- Toilet: Main one with separated wet and dry areas. Squat toilets are common, hence, the usage of water closet is not justified/logic, since they do not use chairs even in their daily life.

7.1.1.1. *House Details*

-Windows: The double leaves window design, particularly wooden Shish frame, is preferable than the traditional four-quartered window design. Since “*people and causatives of the traditional four quartered window do not exist anymore^[1]*”. Window height in *Marbū‘ah* is preferred to be in a low level, to allow for visual accessibility between outdoor and indoor, on contrary of the rest of the house spaces. Windows in *Marbū‘ah* function as communication mean between both house zones in case of receiving visitors.

-Drying clothes: It is preferred to make the roof tops accessible in order to be used for drying clothes. People are randomly drying their clothes at house doors and outdoor spaces, fig._7.02.

-PV cells: In case of PV provision, an appropriate corner is required with proper roof construction, and indoor safe and uneasy accessible space.

7.1.2. A HOUSE EXTENSION: LIFESTYLE

NEEDS

As house extensions are part of the long-term lifestyle pattern of the villagers, considering a sufficient space at the land lot for the horizontal expansion is recommended. In case of extensions to apply lifestyles needs, such as receiving foreign visitors, an Integrated *Marbū'ah* Unit is suggested. This unit comprises of *Marbū'ah* attached to its toilet, and a lobby leading to the house Δ. This lobby could function as a relaxation space if any of the visitors needs to take a nap, fig._7.03 & 7.05. It is also suggested to attach a small room for guests to sleep in, in case of an overnight visit.

7.1.3. A HOUSE EXTENSION: EXTENDED FAMILY

NEEDS

The increase in the family number results in the need for house extensions. This is reasoned by either accommodating children or a newly married son. At the latter situation an Integrated Bedroom Unit is suggested to be constructed attached to the core family house. The villagers call this unit “*Şqqah*” or apartmentΔ. It comprises of a master-bedroom attached to its toilet with an intermediate lobby space Δ. This lobby leads to the house main lobby,fig._7.04. At the former situation one bedroom is constructed Δ following the spatial organization of the house. It should be close to the

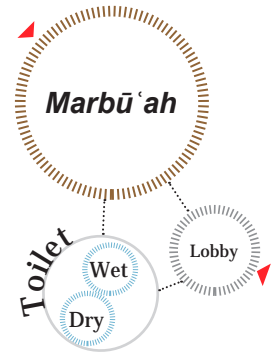


Figure 7.03: Zoning diagram for the suggested Integrated *Marbū'ah* Unit

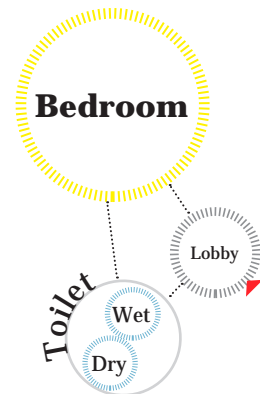


Figure 7.04: Zoning diagram for the suggested Integrated Bedroom unit for the extension of newly married couples



Figure 7.05: Separated Integrated *Marbū'ah* Unit

sleeping zone; at the private quarter of the house. In both cases, north is the most recommended orientation.

7.2. GUIDELINES FOR THE ENVIRONMENTAL ADAPTATION “Materials and Design”

In hot arid climates such as *The Village* providing an indoor thermal comfort during daytime is intended to minimize both; the heat stress in buildings, and its negative effect on health and productivity rate (Givoni 1991). Passive cooling systems are effective to provide an indoor thermal comfort during summertimes through applying careful design procedures, such as; daytime ventilation, high mass-thermal, and nocturnal ventilation. However, its cold winter should be considered as well. These will be considered in the suggested design guidelines. According to the analysed housing typologies, the different traced patterns of adaptation to the environmental contributed in shaping the means for the sustainable living of the villagers. Building layout and orientation, window sizes and detailing, and colour of the building’s envelope are effective design aspects to be included in the following sections discussing; the passive design principles, the house orientation and morphology, and the building materials.

7.2.1. PASSIVE VENTILATION PRINCIPLES

7.2.2. HOUSE ORIENTATION AND MORPHOLOGY

Because of *The Village’s* harsh climatic conditions; too-hot summers and cold winters, the aim is to provide an indoor warm environment during winter and reduce loads of cooling during summer (Givoni 1994). This is achieved by minimising heat gains in summer and heat loss in winter.

The compactness of the external building envelope is one of the principles contributes in reducing daytime heat gains. Given that the thermal transmission via walls and roofs constitutes more than half of the cooling loads (Ahmad 2004). In addition, the lack of air tightness might cause an elevation of the

indoor air temperature through daytime infiltration or undesired ventilation. Thus, it is challenging in the vernacular non-industrialized buildings especially with the traditional building technique applied in *The Village*.

Building layout and rooms' orientation is another added factor affects the indoor thermal comfort. Orienting houses to the North and avoiding the East and West facades lessen the thermal heat gains on the external building envelope and allow for a perfect ventilation if openings are monitored. This is according to the direct solar radiation intensities in hot arid areas (Hamza 2008). Accordingly, important and most usable spaces, are advised to be oriented towards North, such as; *Marbū'ah* and bedrooms. On another side, adding at least one space for each season (summer and winter) is feasible and advisable (Ibrahim 2010), like the vernacular concept of the winter-room.

In addition, the daily life attitude of the inhabitants contributes in providing better indoor thermal comfort. Using the internal courtyard for drying clothes supports indirect evaporation cooling to the indoor spaces, fig._7.02. This is also applicable from the outdoor if the wet clothes are dried in front of widows facing strong winds, fig._7.02. This contributes in 40-50% reduction of the indoor air temperature (Givoni 1991).

7.2.3. BUILDING MATERIALS

The Building Envelope: The thermal characteristics of a building are greatly influenced by its envelope. Walls, roofs and openings causes around 50% of the energy loss in residential buildings (Kos'ny *et al*, 2006 cited in Attia & Wanas 2012). Therefore, it is recommended to carefully choose and calculate the R-value^[2] of the building's envelope (Al-saadi & Budaiwi 2007).

Because of the thermal time lag of the building materials, the indoor air temperature in a high-mass building reaches its maximum in the evening. "*If a building is ventilated, day and night, the indoor temperature is close to the outdoor level during the daytime but is higher than outdoor during the night hours.*" (Givoni 1991)



Figure 7.06: *Karšif blocks*



Figure 7.07: *Rubble sandstones*



Figure 7.08: *Limestone bricks*

No doubts that *Karšif* has been the inherited contextual material that provides an indoor thermal comfort, fig._7.06. But nowadays it proved to have many technical limitations^[3]. Therefore, technical studies on its properties might end up with practical solutions for its associated problems.

The choice of the building material and colour^[4] of the building envelope has effective impact of the building's thermal performance especially for roofs, western, eastern and southern facades, while the northern one is the least sensitive. According to Givoni (1994) applying a reflective envelope colour such as white is a cost-effective feature to effectively minimize unwanted heat gain during summer. However, low-mass envelopes, even if the building is ventilated during night, cannot maintain enough "coolness" to significantly affect the high rate of temperature during the daytime (Givoni 1991). This is the fault the villagers fell in building in the limestone bricks without paying attention to the difference in the thermal conductivity rate between the limestone bricks fig._7.08, *Karšif* and sandstone, fig._7.07. the coolness and warmness effects during night and daytimes depend on the rate at which heat is absorbed and later released to the indoor air (Givoni 1991).

The high-mass rubble sandstone wall is an appropriate substitution solution for the *Karšif* technical limitations. It provides a relatively good

indoor thermal comfort if mixed with *Tflah* for the balance of the indoor humidity and the sandstone high conductivity rate. However, building walls in sandstones should be maintained in thickness not less than 50 cm, in order to provide a higher thermal mass. Thus, provides a better indoor thermal comfort. The choice of the pasting material affects the thermal storage capacity of a certain thermal mass. Accordingly, calculating the U-values for each wall section; either for the usage of cement mortar or *Tflah*, leads to the most environmentally effective solution.

Since lime properties do not match with the salty materials such as, there is no option to suggest an integrated wall. However, for the betterness of the usage of the limestone bricks, it is suggested to build it either in thick thermal mass or in a double skin bases, fig._7.09. In the later case, the air cavity could act as a thermal barrier or solar chimney, while the exterior wall layer reduces direct solar heat gain in rooms (Hamza 2008). This results in a reduction of the conductive heat gains through the inner facade layers into the indoor space. (Hamza 2008) providing a relatively better indoor thermal comfort than a half-single wall (15 cm). The Trombe wall system^[5] is another passive application for the double skin that motivates passive heating in winter, fig._7.010, and passive cooling in summer (Ibrahim 2010). However, its application in The Village might be

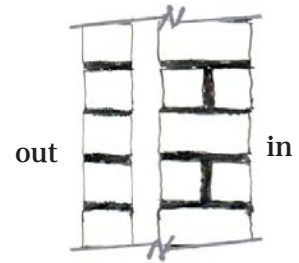


Figure 7.09: Double skin limestone wall for a better thermal performance

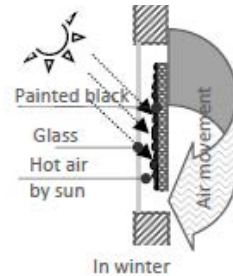


Figure 7.10: Trombe wall system (Ibrahim 2010: 28)



Figure 7.11: Integrated ideas for the Qişiyah base (using red bricks)



Figure 7.12: Integrated ideas for the Qişiyah base (inserting flexible tubing)



Figure 7.13: *Qišiyyah base*



Figure 7.14: *Building a base gabion technique (source: <http://www.flickr.com/photos/yah-ninkabul/605439171/>, accessed: 21.06.2013)*

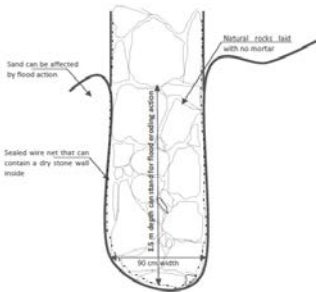


Figure 7.15: *Gabion wall technique (Ibrahim 2010: 13)*



Figure 7.16: *Roofs are just covered with plastic sheet and earth layer*

limited, because using glass is not yet wide-spread in *The Village*, in addition to the rigorous technique needed.

Making use of the earth as a source for cooling is applicable in hot-arid climates like *The Village*; by shading it and enabling water evaporation from earth. Since water level in *The Village* is close to the surface, Givoni (1991) suggested to raise the building off the ground and “facilitate evaporation from the shaded soil surface” beneath and the high water surface level. This results in a conductive cooling through the building’s floor to the ground spaces. This was practically applied in Siwa Spring School in April/May 2013 for reviving neo-vernacular architecture and suggesting new solutions. Two alternatives of the wall base were constructed. The first used hollowed red bricks to allow for air penetration, fig._7.11. The second one integrated a kind of flexible tubes into the normal *Qišiyyah* base fig._7.12. The idea of these two solutions came as a solution for the earth humidity problems, at the same time, making use of the common *Qišiyyah* base for passive cooling purposes, fig._7.13. The idea included evacuating the volume of the *Qišiyyah* base, which has been usually filled with earth. This allows air ventilation that provides conductive earth cooling for the ground floor spaces.

Another application for the same concept is the gabion wall, fig._7.14 & 7.15. It is a latticework

container filled with loose rubble stone. It insulates the earth's moisture from affecting wall in addition to provides conductive earth cooling (Ibrahim 2010).

Roofs: Several wooden structures are traced in the house roofs of *The Village*, however, those trials were not based on environmental reasons. Reinforced concrete roofing is still very limited there, not because of its limited environmental performance but because of un-affordability of the villagers, for transportation and cost reasons, comparing to other wooden alternatives. Individual initiatives took place for integration of basic insulation layers, fig._6.22, yet, most of the roof tops are covered with poor plastic sheets in addition to a layer of earth, fig._6.28 & 7.16. Therefore, roof structures need to be provided with insulation layers in order to resist rains and reduce solar gains.

Windows: Small windows are recommended for desert regions. The larger the window the higher its heating effect (Givoni 1994). Windows' orientation can elevate indoor air temperature through solar energy penetration if positioned on the western or eastern facades. Thus, northern and southern openings provide better comfort ventilation. Prevention of undesirable sun rays in summer on the southern openings can be achieved via horizontal overhangs, while irradiating the southern wall in winter (Givoni 1994). However, large windows are desired if provided by openable shutters that can prevent direct sunlight, penetrating air through small areas in between shutters. This can be opened at summer night to allow for indoor cooling ventilation. At the same time, providing large southern windows allow for direct solar heating in winter. Its shutters can be closed at night to trap indoor heat maintaining the indoor thermal comfort (Givoni 1994).

7.3. SUSTAINABLE POWER PROVISION

Making use of the solar energy as a renewable source of power provision for a 24/7 of power supply is beneficial on all levels. It is an appropriate solution for the remoteness of *The Village*. In addition, it provides a clean source of energy, perfect and sustainable solution. Moreover, it integrates a high-tech solution in a compatible system with the low-tech means embedded in *The Village*, fig._7.17 & 7.18. The introduction of this new system into home spaces, introduced in turn



Figure 7.17: Domestic PV system on the roof top of a house

social changes in home habits. These changes are, but not limited to, the daily cleaning and maintenance duties.

Studying the feasibility and means of widespreading the provision of this system to include both the present and future developments in *The Village* is recommended. However, this is conditioned to be compatible with the existing built/living environments.



Figure 7.18: The domestic PV corner inside homes

7.4. CONCLUSION AND RESEARCH SIGNIFICANT RESULTS

The guidelines presented in this chapter tried to find an appropriate fit between the local culture and the introduction, if not the need, of a technology. It did not object the existence of specific technologies, but adapting it to the surrounding context. The introduction of the PV system proved that environmentally friendly solutions do not, all the time, compromise the users' lifestyle.



Figure 7.19: High-tech photovoltaic system are integrated with the low-techniques and lifestyle in a compatible living environment

Attempts of regulating and adapting the present interventions to the context and most common requirements of the villagers, is an intended aim supports the development of the compatible neo-vernacular approach for the living environments in *The Village*. This helps the society to be brought into maturity, according to Oliver (2003), to accept what contributes to the realization of the village's future and reject what does not. Thus, "*A dependent society which cannot function without the injections of concepts, technology of finance is ultimately doomed*" (Oliver 2003: 266). However, a wise and mature injection is required, fig._7.19.

7.5. POTENTIAL CONTRIBUTION IN FURTHER RESEARCH

Accordingly, the research contributes to further related researches into different potential research realm, such as:

- A quantitative study of the building materials' properties and its environmental performance in hot-arid climates is needed, in order to provide the most appropriate guidelines/solutions to the context.
- A holistic assessment study of the approach of the sustainable architecture that integrates low-tech and high-tech to fulfil the daily life needs.
- A study of an approach for modernization of the traditional building techniques; in contributes in developing a contemporary appropriate model for the architecture in *The Village*.
- An archeological historical study of the old *Şālī* in *The Village* is a missing research point, especially if studied in comparison to the other two *Şālī*'s in Siwa and *'Aġūrmī*; both in the province of Siwa Oasis.
- A study of the decision making process and the social structure of the villagers; that affected the implementation of the different development projects is also needed.
- A study of the participatory rehabilitation and capacity building processes applied during the rehabilitation project in part of the *Old Şālī*.

CHAPTER SEVEN NOTES

1 Said one of the natural leader in the community meeting, for further details on the discussed topic, refer to Appendix I, section (1).

2 R-value: “or thermal resistance is a measure of the ability of a material to retard heat flow. “R” is the numerical reciprocal of “C” (thermal conductance). The higher the “R” value, the higher the insulating value.” (Code 2010: 1)

3 For details about the problems associated with the traditional building techniques, refer back to Chapter Six: section: 6.3.3. Vernacular vs. Advanced, p. 85.

4 In addition, “Solar heat gains can be minimized effectively through shading by plants, as well as by isolation for walls and roofs.” (Givoni 1994: 24)

5 “This system depends on collecting solar heat inside a cavity of a double wall. This double wall has a glass sheet from outside that can be opened from the top, and a black painted thin wall from inside. The glass can be opened from the top and the black wall has two openings: one on the top and the other is at the bottom. In the wintertime the glass is closed so that the cavity collects solar heat which can be transmitted inside the room by the act of the two openings in the black wall. In summer, the glass is opened from the top and the top opening in the wall is closed. When another window at the opposite side of the room is opened, air ventilation is triggered to enter the room.” (Ibrahim 2010: 28)

* Interview result with representatives from Siwa Town Council and Qārrat 'Um-Āṣaḡīr Local Administrative Unit.

^ Interview result with representatives from North-West Coast Development Authority (NWCDA); based in Marsā Maṭrūḥ city and Siwa Oasis.

Δ Interview result with *The Villagers* and the natural leaders.

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APPENDICES

APPENDIX I

List of Conducted Interviews and Community Meetings

1) Community Meetings

Place	Date	Attendees	Topics Discussed
Siwa Oasis	2nd Jan, 2013 (4 hours)	<p>Total attendees: 9 local Siwans in addition to the IUSD group (around 40 in total)</p> <ul style="list-style-type: none"> • <i>Sh</i> Omar (a tribe's head) • Secretary-general of Siwa City Council • EQI representative • Siwa-CultNat representatives • Manger of the Siwan House Museum • Natural leaders • M.Sc. IUSD (2011/13) students • The accompanying staff and researchers 	<p><u>Discussion on IUSD workshop outcomes including:</u></p> <ul style="list-style-type: none"> • Rethinking the traditional architecture and the present urban invasion. • Governance and the city planning: how is it affecting the urban morphology and society? • Infrastructure and water landscape challenges. <p><u>Discussion on the community's argument on the suggested proposals:</u></p> <ul style="list-style-type: none"> • The urban invasion and the outdoor making up of buildings. • Social structure, solidarity and security. • The excess and high water level challenges. • Alternative environmental friendly and adaptable building materials.
Qārrat 'Um-Āṣaḡīr Guest-hall	3rd Jan, 2013 (45 min.)	<p>Total attendees: not less than 12 villagers in addition to the IUSD group (around 43 in total)</p> <ul style="list-style-type: none"> • <i>Sh</i> Mahdy (the tribe's head) • A number of youth villagers • M.Sc. IUSD (2011/13) students • The accompanying staff and researchers 	<p><u>General information about <i>The Village's</i>:</u></p> <ul style="list-style-type: none"> • Social structure • Number of inhabitants • The Old Ṣālī and reason for abandonment • Building materials and the vernacular houses. • Infrastructure facilities. • Available public services and income sources. • A normal day life of a villager.

<p>Şiḥ Mahdy's house (<i>The Village</i>)</p>	<p>29th March, 2013 (2:30 hours)</p>	<p>Total attendees: 8-10 persons</p> <ul style="list-style-type: none"> • Şiḥ Mahdy • Imam of the village's mosque • A trustworthy eldest natural leader • Natural leader • Interested youth • The researcher and escort 	<p><u>Detailed background on <i>The Village's</i>:</u></p> <ul style="list-style-type: none"> • History. • Lifestyle. • Ethnic origin and solidarity with the Siwan community. • Remoteness and communication. • Traditional building technique and materials • Development projects in the past four decades and reasons of failure or success. <p><u>The housing developments:</u></p> <ul style="list-style-type: none"> • The governmental housing phases • Satisfaction of their current houses and housing developments • <u>Brain storming on the aspired future house:</u> <ul style="list-style-type: none"> • Architectural style. • Building materials and appearance. • Size and minimum required functional configuration. • Architectural features and detailing. • A critical comparative analysis between the vernacular house and the future aspired one.
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2) Interviews with the villagers

Interviewee	Place	Date	Topics Discussed /Sample Questions
Şiḥ Mahdy (Head of the tribe)	Qārrat 'Um-Āṣaḡīr Village	-Jan, 2013 -March, 2013	<p><u>General Info.:</u></p> <ul style="list-style-type: none"> Name, age, marital status, job, education? Since when do you live in The Village? How do you think The Village started? What was the reason? What are your tribal distinctive traditions? <p><u>Their living environment:</u></p> <ul style="list-style-type: none"> What is the type of your house? When have you moved to this house? Where did you live before? How do you organise your rooms? How do you utilize each space? Which space is the most usable? How do you compare the vernacular Karshief houses and the new housing developments? Are you satisfied with the environmental adaptation of both? Do you work in the building sector? Have you built your house by your own? What are the needs that your house did not satisfy for your lifestyle requirements? What kind of modifications and extensions have you added to your house after construction? What are the essential socio-cultural requirements in a new house in your opinion? <p><u>Housing Developments:</u></p> <ul style="list-style-type: none"> What was the reasons behind the emergence of the industrialized materials in the village? What problems did face the vernacular Karshief house? How can a one build a new house (logistics, procedure and subsidy)? What the reasons that motivates new housing developments? How do you find the governmental provided units? Do you live in one of them? How do you get it? how much do you pay for it? <p><u>The provision of the PV units:</u></p> <ul style="list-style-type: none"> What kind of services are you still missing in the village How do they affect the situation in your village? Do you have a PV unit in your home? How do you use it? Is it enough to fulfil all your power needs? When was the PV power provision project implementation? Who was the responsible company? How do you find this project? Who regularly clean and maintain it? How much did you pay for it?
Hajj Soliman (A natural leader, joined the researcher in most of the guided observations)	Qārrat 'Um-Āṣaḡīr Village	March, 2013	
Mr. Younes (LAU employer)	Qārrat 'Um-Āṣaḡīr Village (The LAU)	March, 2013	
Um-Abderrasul (The village's midwife)	Qārrat 'Um-Āṣaḡīr Village	March, 2013	
Awvam (A master builder and two assistants)	Qārrat 'Um-Āṣaḡīr Village (On a construction site)	March, 2013	
Hajj Senosey (An elder villager)	Village	March, 2013	
Mr. Hassan (A local builder and LAU employer)	Qārrat 'Um-Āṣaḡīr Village	March, 2013	

3) Interviews with Governmental Institutions

Institution	Interviewee	Place	Date	Topics Discussed /Sample Questions
Cabinet of <i>Maṭrūḥ</i> Governorate	Director of the Village development department)	<i>Marsā-Maṭrūḥ</i>	March 2013	<ul style="list-style-type: none"> • What are the recent development projects implemented in The Village and other surrounding villages? • What was their impact on the development of the village? • How was the PV project started? Who funded and implemented it? • Who is responsible of it maintenance? • How was the rehabilitation project executed? How did the villagers participated in this project? • Who is responsible of the governmental housing projects in the village? • What are you future development plans for the village?
NWCDA	Architect in the department of projects	<i>Marsā-Maṭrūḥ</i>	March 2013	<ul style="list-style-type: none"> • What are kinds/phases of the housing projects did you provide in <i>Qārrat 'Um-Āṣaḡīr Village</i>? • When has each phase has been implemented? • What were its motivations? • What are the regulations and prerequisites in order to apply for a housing unit? How much does it cost? • Who was responsible for the execution of each phase? • What are the designs of each phase? • How did you work on satisfying the community's needs in your provided designs? • Did you give them the opportunity to amend or add more extensions on the provided unit? • What is the exact role of your department in the project? • What are your future development plans for the village?
	Director of the Siwa execution department	Siwa Oasis	March 2013	<ul style="list-style-type: none"> • What was the process of providing the housing units to the villagers on each phase? On which bases do you choose them? • How much does it cost? What is the payment process? • On which bases do you decide on providing further units? • How is this process administratively performed? • What is the exact role of your department in the implementation process?

DHU	Director of the Department of Housing and Utilities	Marsā-Maṭrūh	March 2013	<p>Most of the interview in this case was focusing on the housing developments in Siwa Oasis, in order to understand the village's housing situation in relation the near settlements.</p> <ul style="list-style-type: none"> • In which housing projects did your department take a role? What was your exact role? • When did each project take place? • How do you work on providing the community's socio-cultural and contextual needs? • What are the process of providing a housing unit? How much does it cost? • What are the future plans for the housing section in both Siwa and Qārrat 'Um-Āṣāḡīr?
LAU	Head of the Local Administrative Unit in the Village	Siwa Oasis	March 2013	<p><u>Housing projects:</u></p> <ul style="list-style-type: none"> • How did the villagers abandoned the Shali to the governmental units? • What was the reasons behind the initiating this housing development? • Who was the executive contractor? or did the villagers build their units by their own? • How was the process of applying for a unit? How will it be in the future? How much does the unit cost? <p><u>The provision of the PV units:</u></p> <ul style="list-style-type: none"> • How many domestic PV units and PV street-lamps did the project provided? • How did you decide on the distribution of the units (houses and streets)? • Who was the implementation company? • Did this project affected the amount of diesel consumed by the village (before and after)? • How do you find/ evaluate this project? • Is there any future plans for further wide-spreading of the project? <p><u>In addition to questions related:</u></p> <ul style="list-style-type: none"> • The published works on the village. • The rehabilitation project of the old shali? • The development project in the past four decades in the different fields and on different levels? • The future plans for a mobile network coverage? • The future plans for better infrastructure and road provision. • The future project for a better health and other services provision.

4) Other Interviews

Interviewee	Job/Position	Place	Date	Topics Discussed /Sample Questions
Arch. Ramez Azmy	Project Manager at EQI	Cairo	March 2013	<ul style="list-style-type: none"> • Their current development projects in the field of eco-tourism. • Gathering information about the execution of the rehabilitation project of the Old Shali in <i>Qārrat 'Um-Āṣaḡīr Village</i> (limitations and difficulties of the project).
Mr. Soliman Abdallah	Executive contractor of EQI in Siwa	Siwa Oasis	April 2013	
Am Hamza	Siwa's master builder in <i>Karšīf</i>	Siwa Oasis On a construction site visit, with practicing building with <i>Karšīf</i> and <i>Taflah</i>	March 2013	<ul style="list-style-type: none"> • Techniques of building with <i>Karšīf</i> and <i>Taflah</i>. • What are the limitations and problems of this technique? • How do they get the materials? • What are the materials properties that enable it to be environmentally adaptable? • How long does it take to build a small room in <i>Karšīf</i> comparing to modernized materials? Is the latter more cost effective?
Local Siwan	Shali-lodge employer	Siwa Oasis	March 2013	General questions about the housing and architectural development of the Oasis.
Local Siwan	Tour guide	Siwa Oasis	April 2013	

APPENDIX II

Sample of Observation Sheet

Building info.:

House No.		Who built it?	
Built in year		Orientation	

Spatial Configuration and floor plan:

Ground floor plan	A sketch is inserted with dimensions (if applicable) + indications of the functional organisation
Cultural features	e.g. Enclosed private, gender segregation, extended family reflections..etc.
Special usage of spaces	e.g. Outdoor celebrations, washing and drying clothes, handcrafting...etc.

External features:

Main facade (sketch, features)		
Window openings (materials, dimensions, concept)	Notes	Drawings
Doors (materials, dimensions, concept)		

Distinctive cultural features (Aesthetical, cultural, functional)	
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Constructional features:

Foundations (Materials, dimensions)	Notes	Drawings
Walls (Materials, thickness, internal and external finishing)		
Roof (Materials, construction concept, insulation layers)		
Flooring		
Toilets (Sketch, concept, furniture)		

Aesthetics and finishing:

Ornaments (if any)	Colours	Finishing features
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Cultural and other features:

Food stuff storage	Internal behaviour patterns	PV units?
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Limitations and problems:

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Notes:

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ملخص الرسالة

تحقيق الاحتياجات المتزايدة للمجتمعات الصحراوية النائية و الأقل حظاً في عمليات التطور أصبح من أهم التحديات المعاصرة و الحتمية. فالتحدي لا يكمن فقط في مدى امكانية امداد تلك المناطق بمقومات و عناصر التنمية، حتى و إن كانت في احدي الدول النامية، و إنما في تطويرها مع ما تميز منها بثقافته الموروثة و عروقه الأصيلة. فقد أصبحت تلك المناطق مهددة بما يشوبها من غزو عمراني و استخدام غير مسئول للمواد المصنعة بعدما تألقت تلك المناطق بما تركه سالفوها من معمار تقليدي إنما يشهد على محاولات متباعدة و متراكمة لأقلمة بيئاتها المعيشية لاحتياجات سكانها الأصليين.

تعتمد الدراسة في هذا البحث على منهجية حالة الدراسة و التي تم تطبيقها في احدي القرى النائية في الصحراء الغربية بجمهورية مصر العربية، و هي قارة أم الصغير. و تقوم الدراسة بمناقشة نهج neo-vernacular للتكامل في عمليات التطوير المعمارية بجمع بين التقليدية و الحداثة تطبيقاً على هذه القرية كمثال لإحدى القرى النائية محدودة الخدمات و الامكانيات. حيث يخلص النقاش - كأحد أهم نتائج البحث - أن التكامل بين التقنيات عالية الحداثة و المتطورة و التقنيات التقليدية البسيطة هو إحدى السبل الفعالة لتحقيق الاحتياجات المعاصرة في البيئات المعيشية الخاصة بسكان تلك المناطق المعزولة مع الحرص على عدم اختراق قيمتها المعمارية المتميزة. و من هنا فتهدف الدراسة إلى تطوير مجموعة من المبادئ التصميمية للأنماط المعيشية في تلك المناطق وفقاً لذلك النهج المقترح عن طريق استعراض و تحليل ردود أفعال المجتمع المختلفة تجاه تحقيق احتياجاتهم المعيشية المعاصرة، و ذلك وفقاً لعدة عوامل؛ اجتماعية و ثقافية و بيئية تؤثر في تصميم و انشاء الوحدات السكنية. يتم ذلك الاستعراض و التحليل من خلال متابعة انعكاس تلك العوامل على التطور في أنماط الاسكان المختلفة خلال الأربعة عقود الأخيرة في القرية محل الدراسة.

نظراً لمحدودية المراجع الخاصة بالقرية محل الدراسة فقد اعتمد البحث بشكل أساسي على عمليات المسح الميداني التي قامت بها الباحثة. و التي كانت دعائمها الأساسية قائمة على العديد من طرق و أدوات المسح الميداني؛ عمليات الرصد من خلال المشاركة participant-observation، الرصد المباشر direct observation أو الرصد بمساعدة مرشد guided observation، بالإضافة إلى اللقاءات المجتمعية و العديد من المقابلات الشخصية مع سكان القرية و المسؤولين في الجهات الحكومية المعنية بعمليات التطوير و مؤسسات خاصة قامت بالعمل في القرية. و يستهدف التحليل بشكل أساسي أنماط الاسكان المختلفة بالقرية.

وفقاً لنتائج هذه التحليلات يتم اقتراح مجموعة من المبادئ التصميمية التي تسهم في تحقيق بيئة معيشية معاصرة و متكاملة تدمج بين التقليدية و التجديد في ذات الوقت. هذه المبادئ قد تكون موجة لعمليات التطوير المستقبلية المتوقعة في القرية و في القرى الصحراوية النائية و المتميزة بشكل عام.

إقرار

هذه الرسالة مقدمة إلى كلٍ من كلية الهندسة، جامعة عين شمس وكلية العمارة و التخطيط العمراني، جامعة شوتغارت كجزء من متطلبات الحصول على درجة الماجستير في العمران المتكامل والتصميم المستدام. إن العمل الذي تحويه هذه الرسالة قد تم إنجازه بمعرفة الباحثة عام 2013.

وتقر الباحثة بأن العمل المقدم هو خلاصة بحثها الشخصي وأنه قد تم اتباع الأسلوب العلمي السليم في الإشارة إلى المراجع العلمية التي تم الاستعانة بها، كلٌ في مكانه و في كامل أجزاء الرسالة.

وهذا إقرار مني بذلك،،،

التوقيع:

الباحث: نهلة نبيل محمود مخلوف

التاريخ: 20/07/2013

نحو بيئة مشيدة متكاملة (تقليدية - مستجدة)

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قرية قارة أم الصغير
صحراء مصر الغربية

نحو بيئة مشيدة متكاملة (تقليدية - مستجدة)

مبادئ تصميمية للأنماط المعيشية مستوحاة من الجوانب الثقافية والاجتماعية و البيئية
قرية قارّة أم الصّغير، صحراء مصر الغربية

رسالة مقدمة كجزء من متطلبات الحصول على درجة الماجستير في العمران المتكامل والتصميم المستدام

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تاريخ المناقشة:.....

الدراسات العليا

أجيزت الرسالة بتاريخ:.....
موافقة مجلس الجامعة .../.../...

ختم الإجازة
موافقة مجلس الكلية .../.../...

جامعة عين شمس



جامعة شتوتغارت





نحو بيئة مشيدة متكاملة (تقليدية - مستجدة)

مبادئ تصميمية للأنماط المعيشية مستوحاة من الجوانب الثقافية والاجتماعية و البيئية
قرية قارة أم الصغير، صحراء مصر الغربية

رسالة مقدمة كجزء من متطلبات الحصول على درجة الماجستير في العمران المتكامل والتصميم المستدام

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