Available online at www.sciencedirect.com

ScienceDirect

Procedia Environmental Sciences 37 (2017) 342 – 355

Procedia Environmental Sciences

International Conference – Green Urbanism, GU 2016

Green Architecture as a concept of Historic Cairo

Hanan S. Saleh*, Salah Z. Saied

Associate Lecturer, Dept. of Architecture, Faculty of Engineering, Future university in Egypt, Cairo 11841, Egypt
Professor of Architecture, Department of Architecture, Faculty of Engineering, Al-Azhar University, Cairo 12613, Egypt

Abstract:

Green Architecture appeared as a result of the negative impacts on the environment surrounding the buildings and in a wider scope as a result of the power consumption increases and the use of environment pollutants, besides other elements attributing to environment imbalance of the Earth. Thus, Green Architecture appeared as a sort of historical reconciliation with the environment. Meanwhile, the majority of the developing countries including Egypt showed an intensive increment in the building's volume that were blind copied from the current international architectural trends neglecting any environmental aspects. On the other hand, the Egyptian historical heritage, particularly old Cairo districts, used to give great respect to the climatic conditions of their environment while maintaining the unique value of their architectural style. Therefore, this research aims to focus on this Egyptian architectural of the historical Cairo are to study and analyse its environmental aspects and treatments in order to derive their architectural bases that are suitable for their local environment with Egyptian green methods. The research was carried out through two main phases; the first phase was based on a theoretical analytical study of a specific house form Historical Cairo, El El-Suhaimi house, while the second empirical phase was conducted for the same case study using simulation methods through Design Builder simulation software in order to assure that all findings conform to the recommended ones that could achieve the desired thermal comfort. The results of the case study showed great potentials in using the passive designs methods of this historical house to enhance thermal comfort in residential buildings which located in hot arid climates. Thus, this paper concludes that the traditional architecture, specifically the historical Cairo architecture, proved to be suitable to become a permanent reference to make use of its elements and particulars in the formation of modern green architecture of a local identity and style.

Peer-review under responsibility of the organizing committee of GU 2016

Keywords: Islamic Architecture, Historical Cairo, Resedential buildings, Thermal comfort.

* Corresponding author. Tel.: +20-01117400454; fax: none.
E-mail address: hanan.salah@fue.edu.eg

Peer-review under responsibility of the organizing committee of GU 2016
doi:10.1016/j.proenv.2017.03.064

1. Introduction

There are trends of modern architecture that have been recently emerged in the development of environmental awareness of architects in addition to advancement in the technical and technological systems of the buildings to cope with the environmental requirements and needs of architects and user(Romm, 1994), .(UNCH,1990) .Among such modern trends, the term "Green Architecture" appeared as a result of the negative impacts on the environment surrounding the buildings and in a wider scope as a result of the increase in power consumption and the use of environment pollutants, besides other elements attributing to environment imbalance of the Earth .

Despite the fact that the roots of ancient Egyptian civilization were formed through stages of human creativity associated with natural environmental awareness that later on was merged with architectural awareness to develop architecture compatible with the surrounding environmental conditions proved to be successful like the historical architecture of Cairo, which is neglected this impetus of architectural heritage, which is one of the most important leads of civilizations, without consideration to its architectural, environmental and aesthetical values (Hanna,1981). The Egyptian architectural product turned to be completely far away from our local style and climatic conditions. On the architectural level or mass designing, the present buildings have become like machines with no specific identity. In view of the call for matching with modernism and the environmental renaissance for the implementation of "Green Architecture" we started to realize that our traditional architecture is our significant lead civilization. Therefore, it is imperative to focus on a part of that Egyptian architectural heritage, particularly, the historical Cairo area and study it's environmental aspects in order to understand and comprehend such architecture and derive architectural bases suitable for the local environment with Egyptian green methods (Fathy,1986), (El-Basha,1989) .

Hence, the concept of this research emerged, a study of the green architecture phenomenon on academic bases, based on reconsideration of the previous experiments "the historical Cairo area", which most of the research focused on, not only from the theoretical perspective but also based on analytical study of selected residential house, to reach the determinants which achieved such environmental features for this historical city. This will be done by utilizing the technology of making Virtual Models that precisely simulate such architectural reality, then by making use of the available software in producing analytical studies for the architectural structures to understand its environmental and climatic performance. Thus, a certain the historical building of this city, which is **El-Suhaimi house** shall be subjected to a contemporary evaluation process by using digital technology aiming at giving attention to such traditional indicators, then developing them and introducing the adjustments required to suit the present climatic conditions to eventually obtain green buildings with local identity and style.

Nomenclature of Arabic terms

bayt	House or dwelling
darb	Route or way
quaa	Hall usually with high ceiling
durqaa	A square central high ceiling space
hara	Lane or quarter
iwan	Recessed room
maqad	Seat or sitting area
malqaf	Wooden structure in the ceiling for ventilation
qamariyya	Opening composed of colored glass
salamlik	Men's guest area
Harmlik	Women's guest area
Shukhshikha	Lantern or sky-light
Takhtbosh	A place surrounded two sided wall, third side mashrabiya and forth side is open
Feskia	water element, fountain