



International High- Performance Built Environment Conference – A Sustainable Built Environment Conference 2016 Series (SBE16), iHBE 2016

## Towards adaptive residential buildings traditional and contemporary scenarios in bioclimatic design (the case of Aleppo)

Hadya Salkini<sup>a,\*</sup>, Laura Greco<sup>a</sup>, Roberta Lucente<sup>a</sup>

<sup>a</sup>*Department of Civil Engineering, University of Calabria, Rende, Italy*

---

### Abstract

Traditional architectural typologies could play a crucial role in the environmental architectural contemporary framework, due to many attempts developed in last decades to adopt passive house model and bioclimatic criteria in the Mediterranean areas. According to climate responsive approach, the interactive and adaptive relationship between building, site, and climate consider a basic rule to reduce the environmental impact and improving energy efficiency in buildings. In recent decades this concept has extended to the preservation of the cultural identity of the places. High level of adaptive, sustainable and functional performances could be deduced from the traditional residential buildings as the case of Aleppo proves. The traditional Arab house in Aleppo is based on series of adaptive and sustainable-oriented principles derived from the integration of active and interactive design approaches. The old city of Aleppo (included in the UNESCO List of World Heritage Sites) is considered one of the largest historical cities in the world, in terms of its population number (110,000 people before the war). The damage to cultural and historical heritage by the war asserts the peculiarity of the city in the Eastern Mediterranean area. This paper presents the study that the authors are carrying out on Aleppo, considering the bioclimatic approach as a key element to reorient the future construction process of the Syrian city to achieve the objectives of global sustainability and identify design criteria's for the development of the residential buildings. The study also aims to analyse the mutations which appeared through evolution process of residential buildings and identify the invariant elements and the main trajectories of modification established in the past, confirming their compatibility with the future development of Aleppo.

© 2017 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the organizing committee iHBE 2016

*Keywords: Adaptive architecture; bioclimatic architecture; aleppo*

---

\* Corresponding author. Tel.: +39984496949.

E-mail address: [hadya.salkini@unical.it](mailto:hadya.salkini@unical.it)

## 1. Introduction

Nowadays, many initiatives have been developed to create a contemporary environmental framework for achieving sustainable buildings design, where the quantitative aspects in the residential buildings overwhelmed the qualitative aspects because of the population growth and city development. In addition, the use of modern building materials and new construction technologies have led to a radical change in architectural principles, articulated through the abandonment of local traditional architecture elements, instead of employing them to serve local architecture and environmental circumstances [1]. The historical experiences (in terms of adapting to the current environment) have a wealth of knowledge derived from the past experiments, worthy of consideration to develop innovative solutions that fit with contemporary architecture and maintain the cultural identity of places [2].

In this regard, a conscious and responsible approach of Aleppo post-war should consider the traditional buildings, on the one hand, to preserve the complex cultural identity of the city. On the other hand, to propose new design solutions derived from the conceptual design of the traditional typologies, through balancing the relationship between local materials, building techniques, and climate conditions. When we speak about the traditional buildings (courtyard house) of Aleppo, we enter the lives of a community that lived in simplicity and in harmony with its surrounding. This paragraph discusses the historical evolution of residential buildings in Aleppo city to comprehend the formation and mutations processes in this city. Where the relationship between architecture and nature formed a pivotal force in the architectural design of the courtyard house, thus, this bioclimatic typology could adapt and survive for a long time. Since the Ottoman period, traditional courtyard house in Aleppo was composed of three parts:

- First part: the underground floor, which used for storing the food during the year.
- Second part: the ground floor comprising the main living areas called ‘Al Salamlek’, kitchen, al Iwan, family Living room, guest room, toilets and large courtyard for different activities in summer.
- Third part: comprising the private areas called ‘Al Haramlek’, this floor dedicated for women and consists of
- Bedrooms and terraces for women and children [3].

While the old city’s population was reduced to 100,000 in 1970, the most distinguished development took place in the 16th century at the northern and eastern extramural of the city. Where the western suburbs were developed considerably until the second half of the 19<sup>th</sup> century. The eastern and northern areas of the city were already covered by the suburbs until the 19<sup>th</sup> century. Therefore, the new districts with Western style planning principles were established at the western and northern parts of the city, due to two critical mutations occurred in the social structure of Aleppo. 1- Declining the family size and the transformation of women’s role, where they started working outside the home, 2- To address the new living conditions and adapt with the new family size, most of the families considered that multi-story apartments more compatible than large courtyard houses. These reasons drove to densification the residential buildings at the western and northern parts of the city. This process progressively led to fill the central space in the courtyard house. Which began in 1960 through doubling the height of all facades surrounding the courtyard space to achieve multi- floors units with internal open space surrounded by balconies like a closed patio, also there were external balconies overlooking the road. Many of buffer zone areas structured around the historic center, like Al Saba Bahrat, and Al Gidaida districts, where gradually converted the inner open space to a linear passageway. In the second part of the seventeenth new European building typologies were appeared in the buffer zone areas (the multi-storey connected blocks). In this new typology, the inhabitants tried to maintain their privacy in a new way. The building’s plan consisted of central hall used as living space overlooking to the inner passageway, surrounded by the bedrooms and kitchen, and opened to the surrounding through several small balconies. This topology existed in the western parts of the city, such as Al Gamilia and Al Sabil districts. Then in the beginning of the 21<sup>st</sup> century, new urban areas of the multi-family building (solid housing block) were erected on the western side of the city by public and private housing associations and consisted of separate buildings overlooking the open space. While the courtyard typology continued in the poor residential (informal settlements) and industrial areas like Al Sheikh Maskon and Al Haidariyeh (in the eastern part of the city), as a dominated typology in the illegal areas.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات