

Research Papers on Architectural Heritage

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# Research & Heritage<sup>2</sup>



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|  |            |  |
|--|------------|--|
| ▶ <b>Problems Facing Urban Conservation in Saudi Arabia: Legal and Administration Perspective</b>                                | <b>31</b>  | Nouf bint Mohammed bin Fahd Al Saud  |
| ▶ <b>Urban Heritage as a Brand</b>   | <b>61</b>  | Mona Helmy   |
| ▶ <b>Heritage, Conservation and Good Governance Case Study: Saudi Arabia Heritage</b>  | <b>73</b>  | Damna Alzahrani  |
| ▶ <b>Revitalizing Declining Heritage Areas The Case of Muttrah, Sultanate of Oman</b>  | <b>99</b>  | Dr. Shaibu B. Garba  |
| ▶ <b>Building traditions in the Asir</b>   | <b>123</b> | D.I. Alexander Sieghartsleitner  |
| ▶ <b>Conservation Of Built Vernacular Heritage. A Case Study Of Siwa, Egypt</b>  | <b>143</b> | Mohamed Atef Elhamy  |
| ▶ <b>A critical survey and a design proposal for Al Balad, the Historic District of Jeddah, KSA.</b>                             | <b>165</b> | Dr. Osama bin Mohammed al-Jawahri<br>Prof. Arch. Livio Sacchi<br>G. D'Annunzio |
| ▶ <b>The Nature of Historic Buildings Restoration in Libya</b>   | <b>183</b> | Salem Mokhtar Tarhuni  |
| ▶ <b>Rehabilitation and Adaptive Reuse. A current issue in contemporary Austrian building reality.</b>                           | <b>201</b> | Dr. Caroline JAEGER-KLEIN  |
| ▶ <b>Interdisciplinary Approaches to the Built Heritage and their Role for World Heritage Sites</b>                              | <b>221</b> | Ulrike Herbig  |
| ▶ <b>The Art of Women in Traditional Architecture of Asir</b>  | <b>232</b> | Haifa Mohammed Alhababi  |
| ▶ <b>Women in Traditional Architectural Production Amongst The Beti in Southern Cameroon</b>                                     | <b>241</b> | Professor Martin ELOUGA  |
| ▶ <b>Gender roles and women's influence on traditional architecture and its development in Indonesia: a case study from Nias</b> | <b>263</b> | Ulrike Herbiga<br>Gabriele Weichartb<br>Julian Breulingc                       |
| ▶ <b>Women In Traditional Architecture In Ecuador</b>  | <b>287</b> | María de Lourdes Abad Rodas  |
| ▶ <b>Women and the creation of space and architecture in West Africa: an overview</b>  | <b>301</b> | Ishanlosen ODIAUA  |



# Interdisciplinary Approaches to the Built Heritage and their Role for World Heritage Sites

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**Abstract:**  
The built heritage encapsulates the collective memory of a society. A village, a house, the built environment as a whole is a part of every single person's history and is an important element to define a place as "home". With the UNESCO World Heritage Convention, an international commitment for the importance and the need for the preservation of cultural and natural heritage sites was developed. Profound analysis, recording and research are needed in order to propose a site for listing and management under the World Heritage Convention. As the built heritage is the result of multi-layered developments and influenced by various factors, its recording, research and management requires an interdisciplinary and holistic approach. This paper will demonstrate examples of the concepts involved in dealing with traditional heritage in general, and with World Heritage Sites in detail, with different cultural backgrounds.

## 1. Introduction:

Besides its priceless cultural value, the architectural heritage is a part of the history of people. The built heritage has grown over centuries with the development of settlements, villages and cities and is an inevitable consequence of habitation. Its presence is taken as certain and its importance may only be recognised when lost. Facades of the past are not noted in everyday life but, when absent, can be felt as a missing part of the personal past.

The most significant reflection of the awareness of the importance of the world's cultural heritage is the "Convention Concerning the Protection of the World Cultural and Natural Heritage". In 2012, we celebrate the 40th anniversary of the adoption of the convention by the General Conference of UNESCO on 16 November, 1972. Whereas the concept for the protection of the cultural and natural heritage is focused in the frame of objects, ensembles and regions of outstanding value enrolled on the "World Heritage List". Its measures can be taken as guidelines for other sites and monuments.

For the nomination process, the detailed recording and documentation is a necessity; comprehensive documentation is the first step for preserving cultural heritage. Collected and well compiled data shows the condition of the objects, establishes the base for any restoration and management measures and supports the monitoring of the site. Furthermore, objects and sites are recorded for future generations even if they are lost.



Figure 1: The Maiden Tower, Baku

**2. Interdisciplinary approaches for the recording of monuments and sites** Architecture is the result of a complex process influenced by numerous factors. Therefore, the recording of the built environment needs a multi-layered approach. To do a comprehensive recording of an object or a site needs an interdisciplinary and collaborative effort.

At the Department for History of Architecture and Building Research, methods for the multidisciplinary recording and documentation are researched and developed in various projects within the educational and scientific frame at the Vienna University of Technology. In the following project, the introduction of different possibilities for the documentation and the research of built environment will be described.

### 2.1

#### Recording of the Maiden Tower at Baku, Azerbaijan

In the year 2000, the old town of Baku, Içeri Sheher, was inscribed on the World Heritage List, along with two outstanding buildings, the Shirvanshah's Palace and the Maiden Tower. The Qız Qalası, as the tower is named in Azeri, is a noted landmark and one of Azerbaijan's most distinctive national emblems, yet its fascinating history is not fully discovered. The research of the legendary past, the recording and the preservation of this prestigious monument is a challenging task for Azerbaijan.

In collaboration with the Azerbaijan University of Architecture and Construction, recording of this important part of Azerbaijan's architectural heritage was conducted in three stages.

#### 2.1.1 Phase I: City Analysis

Within the frame of the comprehensive analysis of a building, its embedment into its built environment is the first step of approach. Especially a landmark like the Maiden Tower has to be researched studying the history and the development of the settlement. Whereas the original purpose is still not known, its position offers different ways of interpretation. Situated at the northern end of the city wall, it formerly stood directly on the seashore. Functions as a part of the defence system or as a lighthouse seem possible, but could not be proven so far. But besides this mystery, the tower is an important identification mark for the Azeri people and therefore its contemporary use and its preservation in context with surroundings is vital. To provide a profound base for future planning, the lay out for the analysis of the old town of Baku was developed with staff and students of the Azerbaijan University of Architecture and Construction. In collaborative work, topics about former and contemporary use of spaces, different kinds of building typologies and their adaptations, the development of the town by comparing historic and actual maps and the analysis of

different architectural elements concerning their originality have been compiled. Furthermore the movement within the walled city was studied and completed a general picture of the surroundings of the Maiden Tower, which can give hints for its role in the city and will provide material for future planning to exhibit the tower itself within the city context and to show its importance for the history and identity of Azerbaijan.

### 2.1.2 Phase II: Building Survey

Each preservation and restoration work needs, as a base, a detailed and comprehensive survey of the building. The extraordinary shape of the building needs special careful preparation and handling of the process and it is therefore a very good candidate for the application of 3D laser scanning technology. With the recording of millions of points at a time, this method provides the possibility to create metric information and furthermore, it allows the visualisation and analysis of details, which often are not directly visible on site.



Figure 2: Comparing old and new functions of spaces around the Maiden Tower

Figure 3: Section of the 3D Point Cloud of the Maiden Tower

Additionally, the laser scan data could be used for interpretation of the terrain around the tower. According to historical sources, ritual places have been situated close to the extension building that can be identified in the terrain model.

### 2.1.3 Phase III: Building Archaeology

A detailed analysis of archive material, historic photographs and plans act as the starting point for building the archaeological research of the tower. In addition, a survey of the building detailed to deformation may be conducted using the laser scan data for mapping. Samples of the stone and wood material are analysed to provide an accurate dating of the building phases. This information can be used to unveil the history of the building and may provide a new approach to determine its original function. This work is done accompanying the restoration of the building and in close cooperation with art historians and archaeologists.



Figure 4: Terrain model of the Maiden Tower with the plan of the third level.



Figure 5: Analysis of the stonework of the Maiden Tower

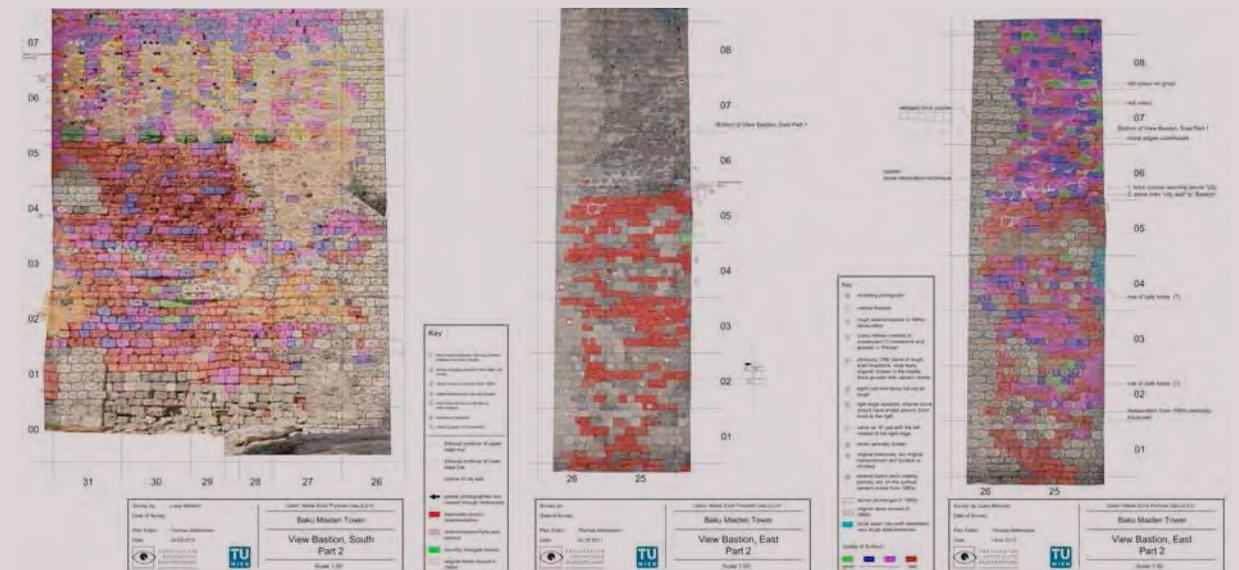


Figure 6: The Baron Palace, Heliopolis, Cairo

## 2.2

### Educational cooperation Project – Baron Palace Cairo

Situated in the district Heliopolis, in the northern part of Egypt's capital Cairo, the Baron Palace is an eye-catching landmark. Erected between 1907 and 1910 by the Belgian businessman Baron Edouard Empain as his private residence, it mirrors the eccentric tastes of its owner. Baron Empain was at the forefront of the development of Heliopolis in 1905 after he established the Cairo Electric Railways and Heliopolis Oases Company, which bought a large stretch of desert some distance to the northeast of Cairo. The idealistic goal of the settlement was to create a place of 'luxury and leisure' where people can live together in harmony independent of their religion.

The Baron Palace was designed by the French architect Alexander Marcel, who followed the idea to create a Hindu-style palace. Today the palace is empty and has been completely closed for several years, but remains an outstanding example of the early use of new techniques with concrete.

As a joint educational program, the recording was done in collaboration with Department of Architecture and Department of Islamic Archaeology of the Cairo University and the Civil Engineering Department of the Assiut University. After the introduction into the methods of city analysis, building survey and building archaeological research, the students worked in international interdisciplinary groups.

Of the utmost importance was the close co-operation between the disciplines of geodesy, architecture and archaeology to allow for a comprehensive and detailed documentation to be compiled, including the maps of the city analysis, describing the interrelation of the building with its surroundings, the plans which provide the lay out of the construction and finally the catalogue of details. In

total, this work can be used for the revitalisation of the building and can support any planning for future use and integration into the contemporary life of Cairo.

The research project ASSIP (Architecture, Space, and Society in Post-Disaster Built Environments in Indonesia) investigates the relations between architecture and society in the context of reconstruction programs after natural disasters. The project goes beyond the recording and analysing of a single object and is focused particularly on changes and interdependencies between the built environment - individual houses and settlements – and local socio-cultural factors. The examination of the influence of these socio-cultural factors on community participation in reconstruction programs and, ultimately, on the social acceptance and sustainability of these programs, is aimed at developing, on the basis of the research results, a database and software tools that will provide easy access to relevant background information about socio-cultural and architectural particularities in regions affected by a natural disaster. This will accelerate the transfer of knowledge and information especially useful in the rebuilding of homes and settlements, between people who need help, the helpers and researchers working in that area.



Figure 7: Example of the room book, a part of the documentary of the Baron Palace



Figure 8: Two villages in Indonesia: Nias (left) a village close to Yogyakarta (right) are sharing similar problems for the preservation of their architectural heritage

Two regions in Indonesia, the island of Nias (west of Sumatra) and the Special Region of Yogyakarta in Central Java, have been selected to compare different approaches to the reconstruction of architecture after major earthquakes.

The methodology of the project requires intensive collaborative research between geodesist, architects and anthropologists. Geodesists are responsible for generating the framework for the collection and the management of the data using a geographical information system (GIS), providing the capability to manage the data according to its geo-referenced place of acquisition. Settlement maps, plans of buildings and the accompanied interviews of house owners, stakeholders, craftsmen or other relevant informants can be collected in a way that allows an analysis of interrelations for a transparent and comprehensible visualisation of the results. Data is collected by conventional surveying methods, by using satellite and aerial pictures and by using GPS records. Maps and GPS tools are provided for the other members of the team.

Figure 9: Orthophoto of Hiliamaetaniha, Nias, images captured with a Quadrocopter



Architects are charged with conducting building surveys of different building typologies and with managing their data within the prepared framework. The results of the building surveys are used to analyse the development of the architecture in the regions of research, focusing on the transition between the pre and post-disaster era. Additional to the survey of the construction, the architects work on the analysis of the utilisation of space in and around the houses.

Figure 10: Sketch of a function analysis on site



This work has to be done in close collaboration with anthropologists, who carry out interviews with the house owners. This oral information will provide an insight into traditional and contemporary living. Only through an intensive interview process can the changes in the built environment and its impact for the social life be collected and interpreted.

Through this interdisciplinary work, the importance and the meaning of the traditional architectural heritage, especially facing disasters, can be analysed. From the architectural point of view, the details in construction and adaptations of traditional elements are studied. Combining these results with the findings of the anthropologists, possible scenarios for the future of this part of the world heritage can be estimated.

### 3. Conclusion

Facing a globalised world and the concomitantly uniformity of architecture, the tasks of the world cultural heritage are more important than ever. Our heritage shows us the human capacity to form communities, enhance life and continuously appeal for a natural and cultural balanced world.

In this regard, cultural heritage must fulfil an essential function in clearly stating the sustainable principle and offering, protecting, presenting and developing cultural carriers of meaning. Communal participation will engender a sense of individual and collective ownership of culture and history.

By recording and documenting the architectural heritage and introducing any discipline related to a factor that might influence the built environment may be a first step into the right direction.

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