Prerequisites for Post-Disaster Regeneration of Historic Cities

Judith Ryser
Fatemeh Farnaz Arefian

Editors

Silk Cities

Silk Cities is an independent professional and academic initiative for knowledge exchange, research, engagement and raising awareness on under-explored contextual and global challenges and opportunities. Its initial geographic focus was on those countries along the Silk Roads in the Middle East and Central Asia. This region is the home of long lasting urbanism and civilisations, therefore enjoys rich tangible and intangible heritage built over millenniums and centuries of history. However, the region also suffers from contextual and global challenges affecting societies and cities. Additionally, it has suffered from a variety of destructive incidents especially in recent decades, ranging from natural hazards to human induced origins, from earthquakes to wars.

Fostering international dialogue and knowledge sharing, the geographic coverage of Silk Cities reaches out further to other cities, regions and countries which are prone to similar issues and global challenges.

With a vision to improve the quality of cities and urban life, Silk Cities bridges the gap between local and global efforts, between younger and experienced generations of diverse urban stakeholders, and brings together academia and practice. It has a growing network of individuals and organisations both in the region and internationally.

Book and E-book Publications:

Historic Cities in the Face of Disasters
Book edited by Arefian F.F., Ryser, J., Hopkins, A., MacKee, J.Springer- forthcoming in 2021

Prerequisites for Post-Disaster Regeneration of Historic Cities
E-book edited by Ryser, J., Arefian, F.F., 2021, Silk Cities

Urban Heritage Along the Silk Roads
Book edited by Arefian F.F., and Moeini S.H.I., 2019, Springer

Organising Post-Disaster Reconstruction Processes
Book authored by Arefian, F.F., 2018, Springer

Urban Change in Iran
Book edited by Arefian F.F. and Moeini S.H.I., 2016, Springer

Website silk-cities.org

Contact info@silkcities.org

Mailing list silk-cities.org/join-our-email-list

Judith Ryser
Fatemeh Farnaz Arefian
Editors

Prerequisites for Post-Disaster Regeneration of Historic Cities

Judith Ryser
Editor

Fatemeh Farnaz Arefian
Editor

Ali Puya Khani
Cover design, book layout and research assistance

Nafiseh Irani
Data management and communication

Maria Diez
Geographic coverage maps

ISBN: 978-1-8383625-0-8

Preface

Post-disaster reconstruction, disaster management, risk reduction and urban resilience form important themes of Silk Cities activities as the initial geographic focus of Silk Cities is the Middle East and Central Asia which during recent decades have suffered a variety of destructive incidents, ranging from natural hazards to conflicts and wars. This is also linked to my personal practice-based experience. My four years of working with reconstruction stakeholders including disaster-affected families during post-disaster urban reconstruction in the historic city of Bam, a world heritage site, triggered my doctoral study and further research and academic activities on the subject matter at international level. This experience was influential in founding Silk Cities.

Post-crisis city recovery is multidimensional and post-disaster reconstruction is a manifestation of physical recovery that should facilitate other kinds of recovery, including psychological, social and economic recovery and enhance future resilience of residents. Nevertheless, even in normal situations cities are complex mega-systems and managing them in historic contexts is even more complex as it also connects with collective memory and layers of history underneath tangible and intangible urban aspects. Dealing with disasters in such contexts significantly intensifies complexities and requires understanding layers of complexities from disaster management, urban development and heritage perspectives, their overlapping areas, stakeholders and practical consequences in the field, especially when working with disaster-affected locals.

There is a need for multi-perspective and multidisciplinary examinations of cases, listening to different voices and trying new approaches and tools. This publication aims to contribute to such explorations by bringing together different disciplines and standpoints. It is the first self-published and open access e-publication by Silk Cities and represents another milestone in its journey.

As acknowledged separately, chapters are based on peer reviewed and updated revisions of a selection of papers presented at the 3rd Silk Cities international conference. Silk Cities 2019, entitled: Reconstruction, recovery and resilience of historic cities and societies, held at University of L'Aquila, 10-12 July 2019. The idea of holding the third Silk Cities international conference on historic cities suffering destructive disasters emerged from the 2nd Silk Cities conference in 2017, hosted by the Bartlett Development Planning Unit (DPU) at University College London (UCL) in

2017. The focus of Silk Cities 2017 was on reconnecting population with urban heritage in the Middle East and Central Asia that included a theme on post-disaster reconstruction. During and after the related thematic sessions at the second conference the need for further discussions and more in-depth attention to this urgent matter was highlighted. Soon after, I first visited L'Aquila in 2018, nine years after the 2009 earthquake, and heard the testimony of the city's disaster-affected residents. It was a clear case that, when disaster occurs, it is the city and its residents who bear the consequences of insufficient attention paid to complexities of organising urban reconstruction and to their role in the multidisciplinary aspects of city recovery. Given the specific nature of the conference subject and the fact that L'Aquila, like many disaster-hit cities in the Middle East and Central Asia, enjoyed a rich history of urban life and heritage it made sense to take the conference there.

The large geographical coverage of the papers presented at the conference portrays the subject matter as a global challenge, for which this e-publication together with the Silk Cities printed book on historic cities in the face of disasters (published by Springer in 2021) act as frontiers. Aligned with Silk Cities strategy, they are forward looking and aim to set new directions and to initiate new discussions. Directions set out in this publication can be traced further in the printed book.

What next?

Under normal circumstances we would have been preparing our 4th international conference, but nothing has been predictable nor normal in 2020 and 2021 so far. Confronted by a global health crisis the challenges the global community had to face because of Covid-19 tested the resilience of us all. With social distancing in place and cautionary measures likely even after successful vaccinations Silk Cities moved toward digital tools. "Urban Talks" around new directions and critical thinking on our cities in the context of a global pandemic and beyond is one example.

Silk Cities continues to engage with both younger and experienced generations of academics and practitioners and the public who care for and have experience in dealing with real life urban matters of cities of concern.

Hope you enjoy the book!

Dr. Fatemeh Farnaz Arefian

Geographic coverage

Fig.I Geographic coverage of this publication - global level (created by Maria Diez, Fundacion Metropoli)

Fig.II Geographic coverage of this publication - Italy (created by Maria Diez, Fundacion Metropoli)

Acknowledgements

Preparing a peer-reviewed e-publication during a global pandemic requires collective dedication. The editors therefore are grateful to Nafiseh Irani and Ali Puya Khani our colleagues at Silk Cities, Maria Diez, and all the authors for their commitment to the project, patience, and flexibility to pursue it as it was envisioned. Thanks all who made this publication possible in a challenging period of "Work-from-home".

Chapters of this e-publication are based on peer reviewed and updated revisions of a selection of papers presented at the third Silk Cities international conference, Silk Cities 2019, entitled: Reconstruction, recovery and resilience of historic cities and societies. It was held at the University of L'Aquila, 10-12 July 2019. Initiated by Silk Cities, the conference was organised by Silk Cities, University of L'Aquila and University College London (UCL). Organising conferences is a collective effort and this conference enjoyed support and contribution of the conference conveners, strategic advisors, and the scientific committee which reviewed papers for the conference and provided feedback, also as guest speakers. They are acknowledged in alphabetic order: Prof. David Alexander, University College London, UK; Dr. Fatemeh Farnaz Arefian, University of Newcastle, Silk Cities & University College London, Singapore, UK; Prof. Yves Cabannes, Emeritus Professor in Development Planning, Portugal, UK; Prof. Lina Calandra, University of L'Aquila, Italy; Prof. Simonetta Ciranna, University of L'Aquila, Italy; Prof. Julio D Davila, University College London, UK; Dr. Donato Di Ludovico, University of L'Aquila, Italy; Prof. Alireza Fallahi, Shahid Beheshti University (SBU), Iran; Arch. Barnaby Gunning, Independent, UK; Mr. Arif Hassan, Independent, Pakistan; Prof. Andrew Hopkins, University of L'Aquila, Italy; Prof. Paola Inverardi, University of L'Aquila, Italy; Prof. Cassidy Johnson, University College London, UK; Prof. Hidehiko Kanegae, Ritsumeikan University, Japan; Dr Alexy Karenowska, University of Oxford, UK; Prof. Ramin Keivani, Oxford Brookes University, UK; Prof. Jamie MacKee, University of Newcastle, Australia; Dr. Roger Michel, The Institute for Digital Archaeology, UK; Dr. Iradj Moeini, Shahid Beheshti University (SBU), Iran; Mr. Babar Mumtaz, DPU Associates, Pakistan; Dr. Florian Mussgnug University College London, UK; Prof. Antonella Nuzzaci, University of L'Aquila, Italy; Dr. Richard Oloruntoba, University of Newcastle, Australia; Dr. Lucia Patrizio Gunning, University College London UK; Prof. Paola Rizzi, University of L'Aquila, Italy; Prof. Salvatore Russo, Iuav University of Venice, Italy; Ms. Judith Ryser, ISOCARP and Fundacion Metropoli, UK; Prof. Antonello Salvatori, University of L'Aquila, Italy; Ms. Anna Soave, DPU Associate, UN-Habitat Iraq Programme, Iraq; Prof. Alessandro Vaccarelli, University of L'Aquila, Italy; Prof. Suzanne Jane Wilkinson, University of Auckland, New Zealand.

This publication is sponsored by Silk Cities. Sponsors of the conference are acknowledged here: Silk Cities; The Bartlett Development Planning Unit (DPU), UCL; The University of L'Aquila; City Partnership Programme, UCL; The DICEAA, Dipartimento di Ingegneria Civile; Edile-Architettura ed Ambientale, Univaq; The DSU Dipartimento di

Scienze Umane, Univaq; The Dipartimento di Eccellenza, Univaq, The History Department, UCL.

Organising the conference to become a success is undoubtedly owed to the support of professional teams at Silk Cities, University of L'Aquila and the Bartlett Development Planning Unit (DPU) at UCL who behind the scene took the responsibility for various stages and tasks during the whole process and made it happen. They are acknowledged here. Professional team at Silk Cities: Maryam Eftekhar Dadkhah, Belgium; Nafiseh Irani, Singapore; Mona Jabbari, Portugal; Ehsan Fatehifar, Iran. Professional team at University of L'Aquila: Carlo Capannolo, Italy; Michela Fazzini, Italy; Sabrina Madia, Italy; Massimo Prosperococco, Italy; Alfonso Pierantonio, Italy. Professional team at The Bartlett DPU at UCL: Jacqueline Hartley, UK; Alexander, Macfarlane, UK; Ottavia Pasta, UK.

Thank you all!

Table of contents

Setting the scene

Fatemeh Farnaz Arefian f.arefian@silkcities.org

Judith Ryser jryser@dircon.co.uk

Cities are complex interconnected social, economic, political and ecological systems. Dealing with disasters, enhancing resilience and managing urban reconstruction and recovery require decision makers to understand these interdependent processes and their interactions. Doing so in a historic landscape adds significantly to complexity. In practice, making sense of such complexities is easier said than done. There is a need for multi-perspective and multidisciplinary study of cases, listening to different voices and trying new approaches and tools to deal with them. This publication offers an opening to such explorations by connecting the built environment, heritage and disasters. Disasters referred in this book are twofold. Most of them originate in natural hazards such as earthquakes, but they also address 'human induced disasters' like deliberate destruction or destructive consequences as a result of development. These calamities are indeed devastating for the built environment, heritage and most of all society and have to be treated accordingly as disasters.

In practice, urban reconstruction programmes and heritage preservation strategies are greatly interdependent for disaster management during and after disastrous situations affecting historic cities and their societies. Influenced by subjective as well as technical and political considerations both reconstruction and preservation are undergoing continuous change driven by material as well as cultural values and priorities.

In recent decades the way disasters were perceived moved away from being an act of god and since 1990s those who analysed disasters were beginning to link their studies to development and to attribute more importance to society. International advancements in this field and the increasing importance of pre-disaster risk reduction evolved alongside each other and led to the Sendai Framework which has set the global agenda for 2015-2030. Since then, reconstruction has become the strategic physical agent of urban recovery, closely linked to future development strategies and the need for resilience. Yet the question of how this is to be achieved in practice is still underexplored (Arefian 2018). Expectations of what can be achieved in reconstruction are changing continuously. To date two expectations are most commonly acknowledged. They are: to integrate strategies, measures, and other tools to reduce future disaster risk in the reconstruction process while enhancing urban resilience; and to enable active participation of disaster-affected people in both the reconstruction of their physical assets and the preservation of their social-cultural identity. Other case-specific expectations, such as maintaining heritage values, are also becoming more prevalent.

In parallel, cultural heritage studies have also progressed. It is now widely acknowledged that cultural heritage is not confined to the preservation of monuments and the collection of historic objects (UNESCO, n.d.). More specifically, urban heritage was gradually perceived as a dynamic asset for the future instead of a dead weight from the past. This led to a move away from static, museum-style conservation of historic buildings and neighbourhoods to the recognition of the many multi-faceted aspects of urban life. The UNESCO Recommendation on Historic Urban Landscape of 2011 promoted a significantly more global vision and gave special prominence to the communities which inhabit historic towns, as well as to their broader built environment. This approach also implied a disciplinary expansion of horizons, with an increasing number of inputs sought and coming from the social sciences (García-Hernández and Calle-Vaquero, 2019). Yet, many of the historic cities whether they are admired by local, national or international communities are potentially at risk. An example is Hoi An in Vietnam that its city centre is a world heritage urban fabric recognised as a living heritage (Fig. Intro.1). The city is in Central Vietnam which is highly exposed to climate change-related incidents (Fig.Intro.2).

Fig.Intro.1 Hoi An, Vientam, a world heritage urban fabric recognised as a living organism (source: Arefian, 2019)

Fig.Intro.2 Flood levels in historic urban fabric of Hoi An (Source: Arefian, 2019)

Another step which became important in the urban context and for the New Urban Agenda (UN 2017) adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador in 2016 was to bring together the UNESCO recommendations of 2011 with other qualitative aspects considered essential for cities and urban development.

Nevertheless, the global challenge of what to do when historic cities are hit by destructive incidents prevails, considering that disastrous and destructive incidents in historic cities are not waning. Recent examples of cities which have undergone natural disasters are L'Aquila, Aleppo, Kathmandu, Erbil and Bam. Figures 3 presents the city centre and historic heart of L'Aquila in Italy that more than a decade after its 2009 earthquake resembles a vast construction site. Figure 4 presents the scale of damage in the historic city of Bam in Iran after its 2003 earthquake. The gravity of the impacts historic cities

and disaster-affected people underwent due to these disasters have triggered further experimentation with innovative approaches to reconstruction and preservation and, in particular, of how to balance competing forces and urgent demands in such a context of highly complex and uncertain post-disaster situations. Acknowledging the wide and diverse range of expectations about how to deal with the historical landscape of a city greatly intensifies and amplifies the complexities of post-disaster urban reconstruction, which is already high and requires multi-objective operational mega-systems (Arefian, 2018). When disaster strikes policymakers, professionals and stakeholders have to confront these issues in the field and in practice, even if they have not thought about them before. They need to be able make sense of the bigger picture, interconnections of competing forces and overlapping policies and operations which may are originated from different disciplines. Highlighting such complex scenarios, ICOMOS has acknowledged the urgent need of bringing together the complexities of post-disaster reconstruction and urban development processes in historic contexts (ICOMOS, 2014, 2016).

The growing international and national recognition of the importance of the population affected by disasters has attracted new entrants to this debate beyond the built environment professionals and the heritage experts. They often belong to those struck by both natural and planned destruction, among them teachers, artists, youths and community activists defending their right to their local identity and some of their experiences are included in the book.

Fig.Intro.3 L'Aquila city centre after10 years from its 2009 earthquake (Source: Arefian, 2018)

Fig.Intro.4 The extent of damage after the 2003 earthquake in Bam (Source: Arefian, 2004)

The examples in this e-publication are chosen from both developing and developed countries with a broad variety of cultural and political values. They are comprising the following countries in alphabetic order: India, Iran, Italy, Latvia, Mexico, and Pakistan. The chapters discuss a wide range of situations and approaches to heritage issues related to urban disasters and resilience, exploring innovative approaches to the everlasting dilemma between reconstruction and preservation in both historical and contemporary cases. The presented experiments and studies focus on urban planning issues and research tools connected to post-disaster reconstruction; how to deal with listed and

unlisted heritage; seismic construction technologies; as well as pedagogical, perceptual and emotional aspects concerning a broad understanding of heritage, including more active involvement of the affected population in making decisions on reconstruction and preservation.

The publication starts with a planning critique on the notion of cultural heritage and urban planning. Chapter 1 poses the question of "whose cultural heritage?" in India and makes the case for the significance of socio-economic values associated with cultural heritage and the importance of local actors in strategic plans. Chapter 2 uses a technical research tool to analyse the impacts of such plans on the Kashan bazaar in Iran and argues that they reduce the resilience of a historic urban fabric to disaster.

A number of chapters address the still prevalent and unresolved dilemma between rebuilding post-disaster the exact past of a certain period "as it was" and updating damaged historic urban fabric using a broader range of criteria about what to retain, what to repair and what to reconstruct. Chapter 4 compares the two opposing methods and their relative measures in the historic case of post-war reconstruction in Latvia and the contemporary case of the post-earthquake reconstruction of L'Aquila, Italy, while Chapter 3 uses local heritage to build resilience and deal with complexities of reconstruction, arguing that reconstruction is not only about preserving past values, but handing down values and contemporary buildings that leave traces of memory to future generations. Chapter 5 deals with human-induced destruction by dams planned to submerge existing settlements under water-reservoirs and how to deal with regenerating memory when resettling the affected communities elsewhere.

Chapters 6 and 7 deal with earthquake resilient building technologies. The former discusses a patented design of round structures applied but not realised for the reconstruction of Messina Italy. The latter develops a model of nonlinear technical analytical procedures to understand seismic impacts applied to the post-earthquake reconstruction of a cathedral in Mexico, also applicable as preventive measure. Chapter 8 also deals with reconstruction methods in Italy but by focusing on a psychological dimension when proposing to use physical 'debris' as a tool to reconstruct memory rather than just physical objects.

The last two chapters are intrinsically forward looking. Chapter 9 advocates cracking silos to make different institutions cooperate in educational processes in Italy by means of a strategy to communicate and disseminate joint actions on cultural heritage sites in cooperation with schools. Chapter 10 focuses on the young generation in Italy and Pakistan, advocating heritage education as a tool of rethinking cities and local areas, thereby mobilising civic engagement and heritage activism.

The objective of this collection is an invitation to think of the bigger picture and how to balance different forces or disciplinary mindsets around heritage conservation, disaster management and urban development programmes. The publication provides an entry point to such explorations and indicates directions for future understanding and action. It aspires to assist researchers and practitioners alike, among them reconstruction managers, urban governance officials, built environment professionals and academics interested in bringing together historical and contemporary cases of reconstruction, as well

as opportunities for self-reflection on the past for stakeholders, academics and affected communities, and the current state of theory, policy and practice in this field.

Publishing these experiences in an easily and widely accessible e-book aims to reach beyond an academic and professional readership and to attract new participants in cultural as well as material reconstruction.

References

García-Hernández, M., Calle-Vaquero, M., 2019. Urban Heritage in Oxford Bibliographies, DOI: 10.1093/obo/9780199874002-0208

Arefian, F.F. 2018. Organising post-disaster reconstruction processes. Springer, Cham, Switzerland.

UNESCO, n.d. UNESCO - What is Intangible Cultural Heritage? [website] Available at: https://ich.unesco.org/en/what-is-intangible-heritage-00003 [Accessed 18/02/2021]

United Nations (UN) 2017. The New Urban Agenda, available from https://uploads.habitat3.org/hb3/NUA-English.pdf [Accessed 15/02/2021]

ICOMOS, 2014. Tangible Risks, Intangible Opportunities: Long-term Risk Preparedness and Responses for Threats to Cultural Heritage Proceedings of the ICOMOS Scientific Symposium, 31 October 2012, Beijing, China. Available from: http://openarchive.icomos.org/1509/1/ICOMOS_2012_Proceedings_final.pdf [Accessed 09/03/2016]

ICOMOS, 2016. Post -Trauma Reconstruction Colloquium proceedings, 4 March 2016, Charenton-le-Pont – France, Available from: http://openarchive.icomos.org/1707/1/ICOMOS%2DPost%2DTrauma_Reconstruction_Proceedings%2DVOL1%2DENGok.pdf [Accessed 09/04/2016]

Whom and whose cultural heritage?

Reflections on the notion of "cultural heritage" in contemporary Indian conservation and planning systems

Mehrnaz Rajabi, Politecnico di Milano, Italy mehrnaz.rajabi@polimi.it

Abstract

The objective of this research is to portray a better understanding of history, significance, and socio-economic values associated with Indian cultural heritage and its contexts. The research depicts two examples of stepwells to investigate them as "cultural heritage," with the aim to highlight the fundamental concerns about the role of diverse local actors involved in the conservation process of such a cultural heritage.

The process of post-industrialisation and rapid urbanisation in the historical cities and villages of western India dramatically affected the social, cultural and economic structure of those contexts in which stepwells, were very well rooted. The stepwell was one of the most important fundamentals of traditional Indian life within the ritual of daily water collecting. Now these stepwells lost their original functions, they were either drastically abandoned or became centres of speculation for the real-estate market targeting immigrants or wealthy clients and tourists. One can observe the same situation around the two stepwells under investigation in this research. They have approximately the same physical, historical, and architectural settings. Both are recognised as recorded monuments of "national importance". However, as they were in two completely different contexts, policy and management situations, they were dealt with totally differently as regards their capacity to serve as cultural heritage for their people.

The current strategic plans and policies affecting those two stepwells, rise considerable doubts about the very notion of who "benefits" from these stepwells as cultural heritage, and from the conservation of their authenticity, under heavy post-industrialisation and rapid urbanisation processes. Therefore, the main challenge which this research addresses is the valid concerns about the identification of legitimate "beneficiaries" from the notion of "cultural heritage" in Indian contemporary planning and conservation strategies.

Keywords: Stepwell, Cultural heritage, Conservation, Post-industrialisation, Rapid urbanisation, Ahmedabad, India

1.1 Introduction

In India, heritage conservation has mainly focused on the fabric of the monuments or, in other words, on "material-based approaches", because in most cases the "colonial-based heritage policies" constituted the heritage legislation and policies in India. Even after independence the Archaeological Survey of India (ASI), established during the British colonial period, has been the sole governmental organisation in India - under the Ministry of Culture - with the responsibility of the protection, conservation, and maintenance of the listed monuments and sites, already recognised as the monuments and sites of "national importance" by Indian law. Alongside the ASI, the archaeological departments of the States are conducting protection and preservation activities for the other protected monuments in the States and the National Trust for Art and Cultural Heritage (INTACH) – the non-governmental body of professionals – is also involved in the identification, documentation, protection, and conservation of the Indian unprotected heritage.

During the post-colonial period, ASI and INTACH have adopted several heritage discourses as well as international charters and guidelines formulated by UNESCO, ICOMOS and international funding agencies, to define conservation approaches for Indian monuments better (NPC – AMASR, 2014). Recently, the first 'National Conservation Policy' deliberated by the Government to safeguard, protect and conserve the ASI's protected monuments and sites was taking into account the contemporary heritage discourses and, in particular, those attempts which demonstrate a paradigm shift from "material-based" to "values-based" approaches. Lately, the 'Council on Monuments and Sites' (COMOS) of India, registered as the national committee of ICOMOS in 2012, started some fresh initiatives through the network of various National Scientific Committees and the Professionals Working Groups of young professionals "to dialogue, develop and advocate appropriate mechanisms, policies and frameworks relating to India's diverse heritage" (COMOS India, 2020, p. 13).

Meanwhile, the "Five-year Plans" of the "Planning Commission" centralised and integrated the contemporary planning system in India with the national economic agendas. The planning system followed the "predict and provide"[1] approach. This was making plans, such as "excessively deterministic"[2] development plans with the strong intention to achieve stable and "secure, balanced and planned development of the urban areas"[3] in Indian cities. More recently the Indian planning system adopted contemporary international trends, such as the "smart cities" concept and approaches like "smart development", as well as the integration between "land use and transportation planning contemplations". The aim was to drive economic development and the quality of life of people in the Indian cities and regions through the empowerment of local development. In 2015, the Government of India launched a policy "think tank", 'The National Institution for Transforming India (NITI) Aayog', to design "strategic and long term policies and programmes for the Government of India", as well as to "provide relevant technical advice to the Centre and the States"[4].

1 Bimal Patel 2020, in conversation with B. R Balachandran on the *Planning the city for an unpredictable future.*
2 Ibidem.
3 See: https://townplanning.gujarat.gov.in/#:~:text=The%20Town%20Planning%20and%20Valuation,the%20urban%20areas%20in%20Gujarat.%E2%80%9D&text=Disseminate%20information%20for%20Land%20Development%20and%20Building%20Construction (Accessed 10 August 2019).
4 See: https://niti.gov.in/ (Accessed 20 June 2020).

Looking into both recent national planning systems and heritage conservation programmes in India, it can be argued validly that India has made a long journey of prised and robust efforts to arrive to its 21st century planning and conservation by contextualising, and sensitising the adaptations of these plans, policies and regulations. Nevertheless, this research tries to identify the main limits and potentials of these attempts to bring critically to the light the actual condition of heritage conservation and its role in the Indian planning systems. To do so, the research examines the recent stories of two of the most significant examples of Indian historical underground water structures, known as stepwells; the Rudabai and Dada Harir Stepwells. Both stepwells are very similar in origin, yet they had different fates in facing the process of urbanisation over last 60 years. Taking advantage of this comparison, the main aim is to trace the key policies, development plans, conservation plans and actions, the process of decision making and the significant actors involved in those stories in order to picture a clearer landscape of conservation in India and specifically the critical contemporary condition of these stepwells.

Historically speaking, Indian stepwells were a brilliant response to the conditions of scarcity of water resources. The stepwell was one of the most fundamental traditions of Indian life when men and especially women founded their principle of social freedom within the ritual of daily water collecting. The finest types of stepwells and the most intense use of a variety of its types could be found in the Gujarat state in the west of India. Ahmedabad city and its hinterlands hosted a significant amount of those water-related buildings. Gujarat has a semi-arid climate with raining monsoons and a dry season of almost half a year. In pre-modern India, stepwells were the strategic infrastructures and celebrated architectures with the capacity to store the water collected from the monsoons underground and to make it accessible during the dry season. Their strategic locations in the vicinity to the main roads and settlements, were well complemented by the nature of rural India. With the late arrival of modernisation to India, almost all these stepwells lost their original function. At present, they are either drastically ignored or, on the contrary, their cultural image is used as the centre of speculation for the real-estate market. The process of suburbanisation took advantage of the geopolitical location of these stepwells usually near lakes or ponds, and of their vicinity to the new infrastructures which made their contexts desirable for real-estate investments.

1.2 Rudabai and Dada Harir Stepwells: two similar historical, physical, and architectural settings

The Rudabai and Dada Harir stepwells were both constructed around 1499[5] A.D, during the reign of Sultan Mahmud Begarah (1458-1511 A.D.), a Muslim ruler. However, both stepwells were built with ladies' patronage. The Rudabai stepwell was built by Queen Ruda, the wife of the Vaghela chief Virasimha (Burgess, 1874; Jain-Neubauer, 1981) at Adalaj village, and the Dada Harir Stepwell was constructed by Bai Sri Harira, a lady who belonged to the court of Mahmud Begarah (Jain-Neubauer, 1981) at the north-eastern part of Ahmedabad city. Both stepwells were established in the fusion style between Hinduism and Islamic periods. Although they were built in the Solanki style (Hindu style) with its architectural and structural features, one can observe the Islamic

5 The date mentioned here is according to the Sanskrit inscriptions.

influence in the specific carving, decorated sculptures and motifs. The architecture and sculpture of those stepwells fit into the context of the late eleventh century of the Maru-Gurjara[6] monuments of the period of Karnadeva (1064-1093 A.D.). The two stepwells were typologically linear subterranean water buildings, with a plain basic structure. Both had their main entrance on the ground floor, raised from the soil by a few steps as the demarcation which led a linear stepped corridor to the underground, reaching the final well shaft at the end of the building[7]. In a more detailed view, both stepwells introduced the journey into the depth of earth, with pillared multi-storeyed pavilions and supporting frameworks that accompanied the stepped corridor along the five floor journey, passing from an octagonal shaft with a square tank, to reach the last stop to the water. The octagonal shaft with a trabeated system of pillar and beams was constructed to counterbalance the earth pressure exerted from both sides of the corridor's retaining walls of the structure (Figs.1.1 and 1.2).

At present, the Rudabai stepwell, its temple, and its small garden and the Dada Harir stepwell with its mosque are confined, protected and categorised as monuments of "national importance" by the Indian Government under the provision of the 'Ancient Monuments and Archaeological Sites and Remains' (AMASR) Act of 1958 (amended and revalidated in 2010). According to the act, no new construction, development, or alteration of the monument, site, or the protected surrounding area can be undertaken without the approval of the National Monument Authority and ASI. Both stepwells are in a proper consolidated condition and protected by the ASI, which under the Ministry of culture is responsible for the excavation, exploration, protection, conservation, and maintenance of the listed monuments and sites of "national importance" throughout India. The Rudabai stepwell, located in the outskirts of Adalaj, a small historical village in the northern periphery of Ahmedabad city of Gujarat State, has recently become one of the destinations for tourists, due to the gradual loss of its original function. The stepwell itself acts like a heritage site and a museum. Conversely, having the same historical and architectural values the Dada Harir stepwell, located in the city of Ahmedabad near the core historic city which since 2017 has been inscribed in the UNESCO World Heritage List, is somewhat ignored, not only by international and domestic tourists but also by the State Government, decision makers, as well as citizens and local people.

6 Maru-Gurjara style was the combination of two styles, which "inherited the propensities of its parents, the basic structural forms and architectural ability of the one, and the ornateness and rich ornamental designs of the other". (Dhaky, 1975. p. 120.)

7 Jutta Jain in "the stepwells of Gujarat," classified them into five non-chronological categories, based on semi architectural and structural features. While Dada Harir stepwell was the representative of the first category with the straight stepped corridor and one entrance, Rudabai stepwell can be put in the second category which was the variation of the first type with three entrances (two perpendicular ones to the main one).

Fig.1.1 Rudabai stepwell at Adalaj (source: author, 2016)

Fig.1.2 Dada Harir stepwell at Ahmedabad (source: author, 2016)

1.3 Rudabai and Dada Harir Stepwells: two contexts within historical Ahmedabad city developments

Originally, stepwells were built within the village or in proximity with the settlements, as well as on overland-roads or cross-roads. They were also resting places for villagers, travellers, and caravans. The Rudabai stepwell at the edge of the historical Adalaj village, in the outskirts of Ahmedabad city, and the Dada Harir stepwell, located on the outer part of the Ahmedabad walled city at the edge of the historical village of Asarwa, followed similar principles of location and construction. Throughout history, the Adalaj village and the Ahmedabad walled city were the main exchange points of trade between northern cities and southern ports of India, and agriculture was the main occupation of the historical villages in western India. That situation gradually changed when the British East India Company (1818–1857) launched its significant career of commercial enterprise, focusing primarily on trade and later the erection of the British Indian Empire (1857–1947).[8]

During the nineteenth and twentieth centuries, the Ahmedabad district and its historical villages, such as Adalaj, had faced significant transformations which changed their social, economic and political structures, mainly due to the opening of the Bombay, Baroda and Ahmedabad Railway system in the 1860s. Consequently, Ahmedabad city "opened up the door of opportunity toward industrialisation of the mill system and the historical city extension beyond the city wall" (Heidari Afshari and Rajabi, 2016, p.936). Once the textile mills were successfully incorporated in the city, the new immigrant labour forces located messily around the mills outside the historical core city around its eastern walls. Thus, rapid population growth in those areas dramatically transformed the settlement patterns of that part of the city edge in which stepwells such as Dada Harir, were once well embedded in their local villages. In contrast, the western side of the Sabarmati River where the Adalaj village is located "was still considered as hinterland [with] a network of villages located beside water lakes or tanks and agricultural land oriented along the geographic and hydraulic system" (Heidari Afshari and Rajabi, 2016, p.936).

After Indian independence in 1947, while the eastern side was urbanised by industries and mostly low-class workers, a better environment was planned in the western part, accommodating a large number of middle-class cooperative housing societies and educational establishments, research institutions and universities. Accordingly, both the eastern and western sides of the city witnessed partial agriculture deterioration and neglect of related water networks, such as the ones vital for Indian villagers' lives. Furthermore, once the new hydraulic engineering system – a piped system- was introduced by the British in India, the "social ecology" of water-related buildings were dramatically altered in the whole region. Although "caring for the wells was once a critical community responsibility and created an invisible circle around a well", "they stopped cleaning it" (Livingston, 2002, p.139). The new piped system became an overarching substitute for the traditional water structures.

8 See: https://www.britannica.com/topic/East-India-Company (Accessed 5 August 2019).

From the late 1960s, emergent start-ups led to the Green Revolution of agriculture and the introduction of new technologies such as deep bore wells. It transformed not only the agricultural watering system forever, but it also changed the pumping system of the thirsty industrial district. By overloaded mass drawing of water, the ground water reached a lower level than the bottom level of the wells, which caused the stepwells such as Rudabai and Dada Harir, to dry up completely. That was the final blow to leaving the water-related buildings abandoned. In the late 1980s, the collapse of textile mills led them to closure. That process was already accelerated by the Central Government's New Economic Policy of 1991(Mahadevia et al., 2014). The eastern areas of the city around the mills – originally inhabited by working class families – gradually accommodated more informal settlements and slums which remain till today, especially around the water bodies and stepwells such as Dada Harir, as well as backyards of the railway. Finally, the main significant event for Ahmedabad city was the shift in the state administrative capital from Ahmedabad to the new-built Gandhinagar city in the 20th century. As a result, the Adalaj village which belonged to the Ahmedabad District was added to the Gandhinagar District. The construction of Gandhinagar revived the Adalaj village as the geopolitical point between Ahmedabad and Gandhinagar which opened up further developments of the two districts (Figs. 1.3, and 1.4).

1.4 Rudabai and Dada Harir Stepwells: actual condition of the two contexts

According to the economic reforms and policies of the 1980s and 1990s, the textile industry crisis and the effects of the "liberalisation of the Indian economy", Ahmedabad's major economy shifted to tertiary or service sector activities and at present the city is one of the "important economic and industrial hubs in India". Around the city and in its periphery at regional level "petrochemical and pharmaceutical enterprises, automobile industries, agro-food processing, and chemical and dying factories" had settled among historical villages. Thus, land prices increased and attracted "large speculative investments" by the private sectors, which transformed the social, cultural, economic, and spatial structures of this context significantly (Mahadevia et al. 2014) and accelerated rapid urbanisation and population growth.

Consequently, several urban projects were initiated by the 'Jawaharlal Nehru National Urban Renewal Mission (JNNURM)' supported by the 'city development plan of Ahmedabad, 2006-2012'. They all formed part of that comprehensive vision which transformed Ahmedabad into the sixth largest city of India, with 5,633,927 population according to the Census of 2011. Although, the post-industrial context of the eastern side of the city was earmarked for development in the 'city development plan 2006-2012' and the 'Comprehensive Development Plan of 2021', it still accommodated industries and settlements of low-income populations where different castes and religions lived together in close proximity. A similar condition can be observed around the Dada Harir stepwell which is threatened by the degraded backyard of the historic railway, besides the informal settlement and an active coal yard located controversially very near several new hospitals, colleges, schools, shops, temples, and mosques.

On the other hand, Adalaj has become a "Census Town city" in the District of Gandhinagar, with a population of 11,957 according to the census of 2011, with 4,000 engaged in the labour market or in business activities.[9] Due to the development of infrastructures of Gandhinagar city and surrounding villages by the 'Gandhinagar Development Plan' of 2011-2031, Gandhinagar Urban Development Authority (GUDA) offered to buy their agricultural land. Thus, in recent years, most people had sold their land and changed their occupations to shop keeping and business start-ups. Controversially, new significant technological developments in the agricultural sector – not only in the Gandhinagar District but on a major scale in the Ahmedabad region – opened up opportunities for new private-sector investments. As a result of the rapid developments of Ahmedabad and Gandhinagar cities, the Adalaj village was transformed dramatically during the last decade. Although the historical core of the village is being considered under protection, the edges of the Rudabai stepwell were altered due to the recent infrastructure developments, such as the Sarkhej-Gandhinagar highway reaching out from Ahmedabad/ Moreover, new touristic facilities were constructed in the tourism promotion year of 2006 which have transformed the social and spatial structure of the village.

Fig.1.3 Dada Harir Stepwell and its context; Top: Google Earth, 2000; Bottom: Google Earth, 2018 (source: base map from Google Earth) (accessed 5 August 2019)

9 In census survey of 2011, worker is defined as person who does business, job, service, and cultivator and labour activity.

Fig.1.4 Rudabai Stepwell and its context; Top: Google Earth, 2002; Bottom: Google Earth, 2018 (source: base map from Google Earth) (accessed 5 August 2019)

1.5 Rudabai and Dada Harir Stepwells: contemporary Policies and decisions

The Integrated Mobility Plan for Greater Ahmedabad (GA) Region, 2031 – the first implemented programme in India in a time span of 20 years – was originally supposed to be "a comprehensive plan, prepared alongside the Development Plan, for the management and development of the transport system in the city, supporting long-range land use objectives of the Development Plan."[10] The vision for the GA region was to increase its inhabitants from 8.1 million inhabitants in 2011 to about 12.5 million in 2031 with 70% employment growth by 2031. The new region would encompass the area under the Ahmedabad Urban Development Authority (AUDA) and the GUDA consisting of Ahmedabad and Gandhinagar cities, four urban centres and 270 villages outside AUDA and GUDA. The plan envisaged major industrial developments, Special Investment Regions (SIRs) in the western and south-western parts of GA, major financial centres, some industrial investments, and areas for residential development.

In the new plan, the main vision was "smart development" set to "integrate the city structure and its transport system, with greater accessibility, efficiency and lower carbon consumption". The plan considered to improve integration of the transport system

10 *Integrated Mobility Plan for Greater Ahmedabad Region Horizon year 2031*, Foreword.

between the prime cities of Ahmedabad and Gandhinagar and surrounding nodes and towns, with new freight corridors for the specially developed zones, regional rail and buses traveling among the nodes and the main cities, and a metro along with BRT, as well as a regular bus service inside the boundaries of the main cities. The new network was also designed to reach the external boundary of the Adalaj village and to provide transportation services for the existing industrial and residential districts near Dada Harir stepwell. Thus on paper, the two stepwells would achieve better statutes within the system. However, it is important to examine the corresponding development plans elaborated for the context of those two stepwells to understand their condition within the comprehensive plan.

Regards the Dada Harir stepwell, although working within the limits provided by the State Government Policy, the "Comprehensive Development Plan 2021" of AUDA proposed an increase of residential areas, new gardens and lakes for the areas accessed by the new transportation systems, and the development and regeneration of the large areas abandoned by the closed textile mills in Eastern Ahmedabad, mainly dedicated to public use. Regarding the historical core of the village and surrounding expansion, according to major spatial arrangements in the land use zoning plan and the General Development Control Regulations (GDCR), the area surrounding the Dada Harir stepwell in Asarwa is dedicated to "Residential Zone I", "commercial zone", and "General Industrial Zone"[11], and only the village is a non-developable area. One can clearly observe in this plan the alterations in the post-industrial context of the eastern part of the walled City of Ahmedabad due to economic speculation of residential extensions. especially since 2002. While the city development plan was planned to conserve the heritage sites in areas of AUDA, both the Dada Harir stepwell itself and its immediate context were not marked as "cultural heritage" by the decision-makers and the developers of the plan and were thus left available for drastic transformations.

Meanwhile on the other side of Ahmedabad, *the* GDCR for the areas under the GUDA, was sanctioned in 2004, while the 'Draft of Gandhinagar *Development Plan' for 2024 was* to ensure population growth, infrastructure and land development for the area of the Gandhinagar Municipal Corporation (GMC), as well its surroundings. The GDCR of the plan proposed separate regulation for heritage conservation in the whole area of GUDA.[12] Likewise, the Rudabai stepwell of the Adalaj village was classified as "Heritage Grade I" which "richly deserves careful preservation" thus "no interventions be permitted either on exterior or interior of the heritage building or natural feature unless it is necessary in the interest of strengthening and prolonging the life of the buildings or any part or features thereof. For this purpose, absolutely essential and minimal changes would be allowed and they must be in accordance with the original" (GDCR of the Draft Development Plan for GUDA, 2004, p. 42). Also, the plan limited any development for changes in the heritage to permission of GUDA only.

11 The "Residential Zone I", includes "residential, commercial and mixed use", which permits variety from single dwelling units to high-rise buildings. The "General Industrial Zone", considers the "light industries" such as "small scale factories, transport terminals" and also the "residential buildings for industrial workers" and "other public utility service staff working within the industrial premises" as well as the "commercial and institutional buildings supporting the existing industries." For the "Commercial Zone," it is permitted high-density housing." (*Comprehensive Development Plan 2021*, 2015, pp. 61-62)

12 That "is applicable to those buildings, artefacts, structures, areas and precincts having aesthetic and/or

The new regulations proposed to conserve the existing organic structure of the historical core of the Adalaj village, with additional promotion of "natural growth in tune with the original village settlement" (GDCR of the Draft Development Plan for GUDA, 2004, pp.74 and 99). On paper, the new regulations would consolidate the stepwell with the Adalaj village, and their context. While the Adalaj village itself still preserved its entity thanks to the plan, the surrounding areas of the village and the edges of the stepwell were under alternation process. These drastic modifications were mainly due to the consequences of separate developments based on the promotion of tourism in India, initiated by the National Tourism Policy of 2002. They were followed by the tourism policies of the States. This includes the Gujarat Tourism Policy of 2003-2010 and the Gujarat Tourism Policy for 2015-2020 envisioned in 2015.

However, in 2005, based on the National Tourism Policy, the Government of Gujarat decided to redefine the Adalaj Stepwell as the gate to North Gujarat for any further development.[13] Subsequently, a new touristic facilities area, known as "theme park,"[14] covering an area of 120,000 m2 was constructed at the northern edge of the protected boundary of the stepwell. Reinforced by the development of the new Sarkhej-Gandhinagar highway reaching out from Ahmedabad and the additional construction of the paved road between the historical core of the village and the stepwell's boundary, the construction of the new touristic facilities not only changed the existing natural lake of the Adalaj village into an artificial water reservoir, but also dramatically modified the edges of the protected ASI boundary of the stepwell. And yet despite all efforts, almost all the new buildings in the new touristic facilities area are left unused, in a state of degradation and isolated from the village. The separation between villagers, local people, national and international tourists was indeed the result of one-way promotions and imposed development of tourism, which worked against the overall spirit of the GDCR, especially in relation to "cultural heritage" and its local communities.

1.6 The main issues and reflections

During recent developments of the two contexts in Ahmedabad city and Adalaj village, and despite the fact that both stepwells are declared as monuments of "national importance," and are both protected by the central government and the ASI, the actual conditions of both cases reveal considerable doubt about the effectiveness of policies and plans, and point rather to political and economic intentions behind some controversial actions. The question is whether there is a consensus among the decision-makers and local people on the significant historical, architectural, cultural, social, and economic values of both stepwells, Looking into the real results of recent developments around those two stepwells puts into question the actual level of protection of their heritage, in favour of economic and political benefits by decision-makers and developers.

The Dada Harir stepwell and its mosque, and the Rudabai stepwell, its temple and small

architectural and/or cultural and/or environmental significance" and "natural areas of scenic beauty including but not limited to sacred groves, hills, hillocks, waterbodies (and the areas adjoining the same), open areas, wooded areas." (*GDCR, GUDA,* 2004, p.39)

13 See: http://www.guda.gujarat.gov.in/ (Accessed 10 August 2019).

14 According to the regulations, Theme Park means, "an amusement park based on specific themes like water park, Disneyland, wonder world, fun-world, adventure land, etc. it includes related facilities like cafeteria, gardens, etc."

garden are protected by their physical boundaries, and they are regularly and by necessity repaired, maintained and preserved by the ASI. They are isolated in their contexts and separated from their physical environment and social and economic structures of their contexts. Unlike other monuments in the walled city of Ahmedabad, the 'protected' Dada Harir and its mosque are not actually provisioned as a heritage site in the development plan of eastern Ahmedabad. This is not that surprising in the context of Ahmedabad city in which Hinduism is the majority religion, up to 81.56%, whereas the legend behind the stepwell is still being followed by a Muslim patroness. One should draw attention to the level of ignorance about that nationally protected monument, not only by the city politicians and decision-makers but also by those neighbouring non-Muslim post-industrial societies. On the contrary, due to its context the protected Rudabai stepwell, being a Hindu stepwell, is considered as the main tourist attractor to bring opportunities to the Adalaj district. Yet even there, one can argue that the stepwell has been used as a point of attractiveness only for the real estate market by developers or/and private actors. It is clear that both stepwells, are not validated truthfully as "cultural heritage;" and their significant values are not fully recognised by decision-makers, politicians, developers. as well as the local people.

Under the AMASR Act of 1958, which was amended and revalidated in 2010, both stepwells are marked by 100 metres around the protected boundary as "Prohibited Area" or "Buffer Zone" where no construction is allowed. By the act, a further area beyond the prohibition area, up to 200m in all directions is also delineated as the "Regulated Area" where any new construction will be granted permission only with the approval of the 'National Monument Authority.' Nevertheless, both prohibited and regulated areas around the two stepwells are partial and deliberated. There seems to be a big gap between the considerations and regulations by ASI and what is actually happening in those contexts, which gets even wider due to lack of effective legal communication and interrelationship between different bodies such as ASI and actors involved: decision-makers, developers, and local people. It seems that when the profit calls the more powerful bodies prefer not to deliberate those further protections around heritage, nor to involve others in the process of decision making.

Moreover, one should not neglect the fact that, in recent years, the decision makings, policies, and planning strategies in India were generally oriented towards the two main concepts of "tourism development" and "smart development," using historical monuments, as the engines for "local development." The discourse on the "tourism development" in India, in emerging recent designations, was introduced by the 'National Tourism Policy of 2002,' while the initial concept of "smart development" in Indian city planning was started by the '12th Five Year Plan (2012–17).'[15] That concept was intended to take into consideration several fresh concepts for India, such as "Sustainable Development," "Smart Growth," and "Smart City." Those concepts have been already defined and have been tested and developed - maybe not always with successful outcomes - not only in the USA and Europe, but also in several other Asian countries. Comparatively, the concept of "smart development" is quite new, and its definition is still under discussion by decision-makers, planners as well as researchers. It is obvious that introducing, developing, and implementing that concept in Indian urban planning, which is so much

15 See: http://planningcommission.gov.in/plans/planrel/fiveyr/welcome.html (Accessed 20 August 2019).

based on "top-down" decision making, could add further issues to the previous unsolved ones.

Realistically looking into the developments discussed here, one can question the actual value and the nature of being "smart," even if the plans were conceptualised by "smart growth" to cover "a range of development and conservation strategies that help protect our health and natural environment and make our communities more attractive, economically stronger, and more socially diverse."[16] By definition, "smart growth" as internationally known, includes "fostering distinctive, attractive communities with a strong sense of place," "strengthening and direct development towards existing communities," and "encouraging community and stakeholder collaboration in development decisions."[17] Above all, in "smart growth" strategy, the role of "community" – existing, local ones, and/or new arrivals - is strongly highlighted in all decisions concerning city development. Unfortunately, that aspect seems very much absent in almost all the developments made by top-down decisions in India. Also, under the reforms of 'Smart Cities Mission' of 2006-2012, although 'the 74th Constitutional Amendment Act of 1992' and 'the Community Participation Law (CPL) of 2007 were presented as "mandatory governance reforms" at State level, "to achieve a democratic decentralisation of power and participatory governance," they "have not been implemented in the city" (Mahadevia, et al., 2014, p. 21). Unfortunately, that central "non-participatory governance" is clearly recognisable in the urban transformation projects near the two stepwells, and in projects such as the Sabarmati Riverfront development, where the vision of producing a "world class" city excluded and neglected the informal settlements like slums (Mahadevia, et al., 2014).

Finally, alongside the Indian Heritage Acts the ASI adopted several international charters and guidelines in 2014 to define conservation approaches for "protected monuments" better. Moreover, the 'National Policy for the Conservation of the Ancient Monuments, Archaeological Sites and Remains' (NPC – AMAS) deliberated safeguarding, protecting, managing and conservation of the ASI's protected monuments and sites and declared them of "national importance" by law. Remarkably, the first conservation policy in India tried to put on the table more contemporary aspects of dealing with cultural heritage. They include: "Community Participation in Conservation," "Public-Private Partnership in Heritage Conservation, and Management" and "Disaster Management" underpinning "the role of local communities."[18] Although the attempts carried out by the Government and the ASI have manifested a shift in the attitudes of policy makers toward "values-based and people-based" approaches to heritage conservation, in practice they have not yet been implemented successfully by the ASI. Likewise, both policy decision-makers, as well as other diversified actors have still not recognised the contemporary notion of heritage and cultural heritage, instead of the old British "archaeology-based conservation practice". As a result, "conflicts between colonial-based heritage policies and contemporary heritage practices prolong value related tensions that have yet to be reconciled at the level of governance and within the heritage profession" (Avrami, et al., 2019, p. 5).

16 See: https://www.epa.gov/smartgrowth (Accessed 20 August 2019).
17 *Ibidem*
18 See: https://mmrhcs.org.in/images/documents/regulation_guidelines/national_consrv_policy_monuments-2014.pdf (Accessed 27 May 2020).

1.7 Conclusions: request for a comprehensive vision

To put it briefly, it seems that in the case of both stepwells, the process of economic speculation, residential extensions and tourism development prevailed over the conservation programmes for the two monuments, and the realistic true weight of beneficiaries and actors were miscalculated in the corresponding smart development plans. Looking at selected issues, opportunities, and threats concerning the actual conditions of the two stepwells (Table 01), it is obvious that the very critical role of local and low-income people, slums, and their informal economy is very much missing. Moreover, in all the strategic plans that government institutions produced, despite their recent robust efforts, another missing link is the strategic orientation towards conservation, management, and protection of cultural heritage. This does not mean that the plans and strategies should include conservation of monuments inside their programmes, but rather that they put the conservation of resources, especially cultural heritage and the territorial capital[19] of "context-specific" cultural assets in the centre of all key decisions. Despite certain economic conditions, actively involving citizens - local professionals, experts, NGOs, cooperatives, social enterprises, educational communities, cultural and creative industries and hubs, etc. in providing context should be the main orientation of the policy-making processes.

Understanding and recognising the contemporary definition of "cultural heritage" is a very constructive yet often absent point in cross-disciplinary policy making and management of cultural sites. And, although in heritage discourses of international debates it is echoed significantly, it still has a long way to go to be respected effectively in local decisions, in particular in countries such as India. Today, we are sure that in the evolution of the built heritage concept "cultural heritage" is no longer a burden for contemporary society, but rather one of the economic drivers of countries, at territorial, regional, and local environmental scales. However, to obtain benefits from the economic, social, cultural, and environmental domains of cultural heritage, the traditional "downstream" approach of investment cannot totally harvest its full potential. Instead, "upstream investment" across a wide range of policy areas has the capacity "to deliver significant 'downstream benefits'" (CHCfE Consortium, 2015, p. 16), by "introducing non-heritage funding into cultural heritage to achieve non-heritage goals, such as social cohesion" (CHCfE Consortium 2015, p. 197) or, in other words, to achieve "positive spill-overs."

To sum up, the effective recognition of those two stepwells or generally of any historical environment constructed as cultural heritage requires a critical shift in attitudes towards comprehensive management strategies. Policies and decision making should aim to harvest optimal performance of local resources, and above all, of people themselves, which needs an insightful cultural heritage led design of "a set of different tools (regulations, incentives, education, and dissemination of best practices…)" (Della Torre, 2010, p.169), at different levels and scales of actions and strategies. That is only possible if a sensitive cultural heritage driven management system, incorporating a long-term vision

19 The concept of territorial capital was introduced for the first time into the regional policy context by OECD in 2001. In 2005, it was relaunched by DG Regio of the European Commission: "each region has a specific 'territorial capital' that is distinct from that of other areas and generates a higher return for specific kinds of investments than for others, since these are better suited to the area and use its assets and potential more effectively." (European Commission, 2005, p. 1)

of planning for diverse aspects of heritage management would be given the chance of getting "implemented in the design of regional development projects which encompass investments in cultural heritage properties and sites" (Della Torre, 2013, p.123). Hence, such a comprehensive vision requires a realistic systematic view and coordinated management programmes in favour of a long term sustainability of site specific cultural heritage.

Table 1.1 Issues, opportunities and threats for the management and conservation of the two stepwells. (source: author)

Dada Harir Stepwell		
Issues	**Opportunities**	**Threats**
The stepwell and its mosque are isolated in degraded industrial context and informal settlement. There are no facilities in and around of the stepwell for the visitors and tourists, etc. The social structure of the context around the stepwell in the process of removal and reduction of local industrial activities is changed. The economy in this post-industrial society is changed. The Government is the sole funding resource.	Fund raising possibility outside Governmental Body, Crowdfunding platforms; Partnership with private players such as sponsors, NGOs, entrepreneurs, renters, culture and creative industries/hubs, etc. Involvement of the local community and skilled people in the maintenance, management of the stepwell and its context and transfer of skills and knowledge from the experts to the local professionals; Raise more consensus among the local people about Dada Harir history and cultural, social and economic values. Promote the site as one major tourist attraction within cultural events, such as heritage walk of Ahmedabad, (during World Heritage Week, City Tours, Festivals such as Gujarat's International Kite Festival and Navratri Festival (nine nights of the Garba folk dance), etc.	Completely changes the economy and social structure of society. Conflictual interests and benefits, too much gentrification and migration, and huge amount of residences around the site that is provisioned in the new AUDA development plan for 2024; Losing the identity of the industrial context and consequently the stepwell itself.
Adalaj Stepwell		
Issues	**Opportunities**	**Threats**
Despite a very high level of costs, the relationship between the monument and its new touristic facilities and therefore the village has fundamental problems. The Government is the sole funding resource; Marginal role of the stepwell in the economy of the village and no economic benefit from the stepwell itself; Touristic facilities aren't economically productive. Inadequate community Involvement; Lack of educational esp. public programmes involving the site and its heritage value; There is no interaction between tourists and the villagers.	Fund raising possibility outside Governmental Body, Crowdfunding platforms; Partnership with private players such as sponsors, NGOs, entrepreneurs, renters, culture and creative industries/hubs, etc. Involvement of the local community and skilled people in the maintenance, management of the stepwell and its context and transfer of skills and knowledge from the experts to the local professionals; Raise more consciousness and consensus among the villagers about the Adalaj history and cultural, social and economic values. Promote the site as one major tourist attraction within cultural events, such as Adalaj Water Festival (in the occasion of the World Heritage Week), etc.	No proper integration between villagers and tourists: failure in successful activation of touristic facilities; Loss of the critical time for achieving the new project goals; Shifting from win-win to win-lose scenarios for the villagers and the Tourism Department. Transforming agricultural fields to residential; Too much commercialisation, gentrification and huge amount of residences around the site that is provisioned in the new GUDA development plan for 2024; Losing the identity of the village and consequently the stepwell itself.

References

AUDA, 2015. Comprehensive Development Plan 2021 (Second Revised), Part III, General Development Control Regulations. https://townplanning.gujarat.gov.in/monitoring/documents/dps-milestone-documents/08D2728415909D1Ejxxnknu5agx0.pdf (Accessed 27 July 2019)

AMC, AUDA and CEPT University. Jawaharlal Nehru National Urban Renewal Mission, City Development Plan for Ahmedabad 2006-2012. http://resma.info/images/file/auda_cdp.pdf (Accessed 27 July 2019).

ASI and Ministry of Culture and Government of India. 2014. National policy for conservation of the ancient monuments, archaeological sites and remains (NPC – AMASR). https://mmrhcs.org.in/images/documents/regulation_guidelines/national_consrv_policy_monuments-2014.pdf (Accessed 27 May 2019).

AUDA, CEPT University and Urban Mass Transit Company Ltd & LEA Associates. Integrated Mobility Plan for Greater Ahmedabad Region, Horizon year 2031, Volume 1-Plan Document. https://wricitieshub.org/sites/default/files/Integrated%20Mobility%20Plan%20for%20Greater%20Ahmedabad%20Region.pdf (Accessed 27 July 2019).

Burgess J., F.R.G.S., M.R.A.S., (ed.). 1874. *Photographs of architecture and scenery in Gujarat and Rajputana.* Calcutta, Bombay and Simla: Bourne & Shepherd.

Campbell, J. M., 1879. *Gazetteer of the Bombay Presidency (1879),* Vol. IV, Ahmedabad. Bombay: The Government Central Press.

CHCfE Consortium, 2015. Cultural Heritage Counts for Europe, project co-funded by the Culture Programme of the European Union, full report. http://blogs.encatc.org/culturalheritagecountsforeurope//wp-content/uploads/2015/06/CHCfE_FULL-REPORT_v2.pdf (Accessed 20 June 2020).

COMOS, 2020. ICOMOS India, Annual Report 2019-2020.

Della Torre S, 2013. Planned Conservation and Local Development Processes: The Key Role of Intellectual Capital, In Koenraad Van Balen & Aziliz Vandesande (eds): *Reflections on Preventive Conservation, Maintenance and Monitoring*, (pp. 123-127) Leuven: Acco.

Della Torre, S, 2010/a. Conservation of built cultural heritage, laws enabling preventive approach: the case of Italy. In M. Gustin and T. Nypan (eds): *Cultural Heritage and legal Aspects in Europe*, (pp. 168-178) Koper: Institute for Mediterranean.

Gillion, K. L., 1969. *Ahmedabad: A Study in Indian Urban History,* Canberra: Australian National University Press.

Government of Gujarat, Industries & Mines Department, 2015. Tourism Policy for the State of Gujarat (2015-2020). https://www.gujarattourism.com/innovator/images/tourism-policy%202015.pdf. (Accessed 20 July 2019).

Government of India and Ministry of Tourism & Culture, Department of Tourism, 2002. National Tourism Policy 2002. http://tourism.gov.in/sites/default/files/policy/National%20Tourism%20Policy%202002.pdf. (Accessed 20 July 2019).

Government of India, Ministry of Tourism (MR Division). 2005. *The Documentation of Best Practices adopted by the State Governments for the development of tourism, Vol. III, State profile and tourism development, Final report.* New Delhi: International Consultants and Technocrats Pvt. Ltd.

Heidari Afshari, A. and Rajabi, M., 2016. Interior urbanity; in-between scales' scenarios for contemporary urban design, learning from Ahmedabad, India. *European Symposium on Research in Architecture and Urban Design: In Between Scales eurau2016 Bucharest, Romania*, 935-942.

Jain-Neubauer, J., 1981. *The stepwells of Gujarat in art-historical perspective.* New Delhi: Abhinav.

Livingstone, M., 2002. *Steps to water, the ancient stepwells of India.* New York: Princeton Architectural Press.

Mahadevia, D., Desai, R. and Vyas, S., 2014. City profile: Ahmedabad. Ahmedabad: Centre for Urban Equity. https://cept.ac.in/UserFiles/File/CUE/Working%20Papers/Revised%20New/26CUEWP%2026_City%20Profile%20Ahmedabad.pdf (Accessed 20 July 2019).

Impacts of master plans on the urban historic area of the Bazaar of Kashan

Parichehr Shafie, University of Kashan, Isfahan, Iran parichehr.shafie@yahoo.com

Jamal S. Hashemi, University of Kashan, Isfahan, Iran jamal.s.hashemi@gmail.com

Hamidreza Jayhani, University of Kashan, Isfahan, Iran jayhani@kashanu.ac.ir

Abstract

With the beginning of modernisation and the arrival of automobiles, changes began in the cities of Iran, followed by the development of urban master plans. These plans have focused on road network improvement, new streets, public access, and housing. In recent decades, urban development to improve historical contexts, including the availability of historical sites in times of crisis, has led to some current interventions. However, these interventions lack innovation and do not pay attention to the characteristics of the historical city and have been constructed with a naive and superficial view. This research seeks to see what effects the creation of new streets has had on a specific example, the urban historic area of the Bazaar of Kashan in Iran. For this purpose, the spatial configuration of the historic area in different periods was studied with the Space Syntax technique. To analyse the spatial configuration, three plans of Kashan, which we produced in 1920, 1960, and 2010, were studied respectively according to four factors: Integrity, Depth, Connection, and Choice. Findings show that changes caused by new streets had adverse effects during the last century, which has led to the disintegration of Kashan's historical areas. The integrity of the Bazaar of Kashan has also been ruptured in terms of spatial and social aspects. It is concluded that some parts of the Bazaar, which are situated next to newly developed routes, have subsequently faced a decrease in integration value and social and economic value. For example, the newly constructed Bab-al-Hawaij street has profoundly impacted the middle part of the Bazaar. The current state of this growing street shows that developing the road will probably cause lots of problems in future for the Bazaar and its central parts.

Keywords: Urban master plans, Historical area, Kashan, Bazaar, Street development, Space Syntax, Iran

2.1 Introduction

Kashan is one of the historical cities located on the central plateau of Iran. According to the results of archeological excavations, this city is known as one of the first centres of prehistoric civilisation and human settlement. It has always been of special importance in all historical periods due to its location on the main trade and communication routes. However, it lost its prosperity for various reasons, including the change of the main communication route from Tehran to Isfahan, previously leading through Kashan to another location. Due to the rich history of the city, the development of its tourism industry and the provision of appropriate infrastructure have been on the government's plan in recent decades.

The first phase of construction of a new street network in the old part of Kashan occurred in line with the modernisation programmes of the first Pahlavi period and under the influence of the entry of automobiles into urban areas in the 1940s and 1950s. The process of constructing these streets which cut through the historical fabric has continued over recent decades, causing disruption to historic neighbourhoods and destroying their integration. Studies show that this important part of the city, which was very prosperous until a few decades ago, is not in good condition now, and its position in the city has been greatly weakened. Most of the native residents of this part have left their homes and have been replaced by the weakest strata of Kashan urban society. Many shops have closed. The buildings have been destroyed or physically worn out, and if restored, they have been restored from a purely physical and aesthetic point of view, or have been replaced by new houses that have been designed and built outside the rules of design in historic contexts. An example of these new streets is Alavi street, which was built in the 1970s under the pretext of better access to the historic fabric.

After that, the development of the street network has always been part of Kashan's urban development programmes and the centre of attention in master plans. Besides, the city's background and its seismicity have intensified such decisions because Kashan is one of the earthquake-prone areas of Iran and has undergone earthquakes many times over the years which have caused a lot of damages and casualties. Typically, destructive urban development is justified by reducing the risks of natural disasters, as well as the aim of urban regeneration and the provision of facilities to the heart of neighbourhoods. These actions and interventions have taken place while urban development programmes have been based on the tourism industry and the use of rich history and urban heritage.

Although these developments are taking place in all parts of the historic urban core, their broader manifestations can be seen around important urban structures such as the Bazaar. A Bazaar is a main characteristic factor of Middle Eastern and Asian cities throughout different historical periods. Since the early days of urbanisation in Iran, Bazaars have been present in cities and have become a key factor in exchanging culture between civilisations. About six to seven decades ago, a complex of four streets, Abazar, Mohtasham, Kashani, and Baba-Afzal streets, was built around Kashan's Bazaar, separating it from the urban environment. In the last two decades, Bab-al-Hawaij street in the north of the Bazaar has been developed gradually by destroying the immediate fabric of the Bazaar (Fig.2.1).

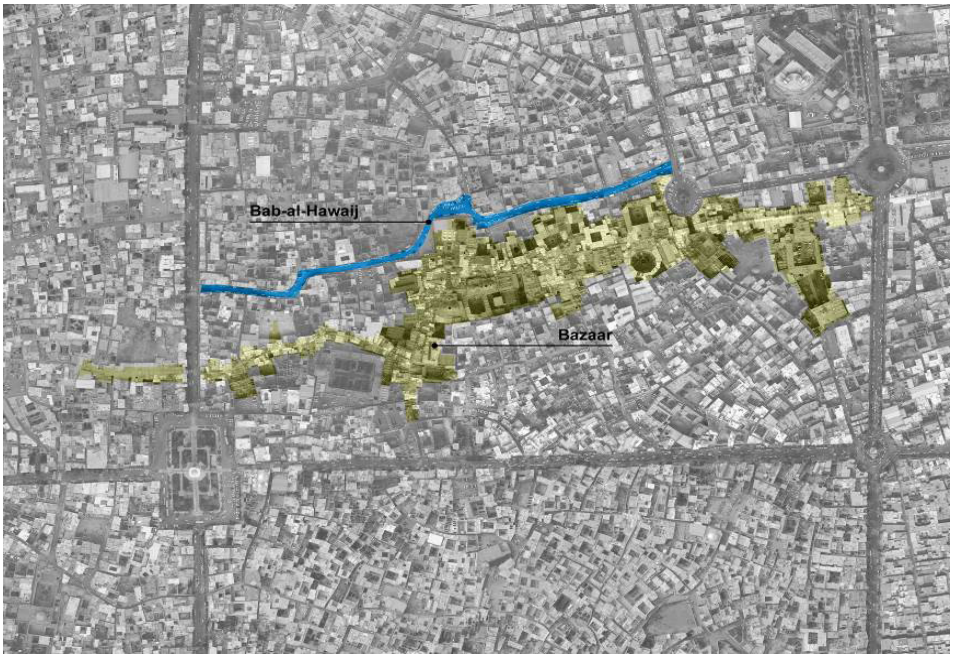

Fig 2.1 The Bazaar of Kashan and Bab-al-Havaej Street (source: authors)

Not only has this destructive process not stopped in recent years but it has gained new scope. For example, in the middle of the newly established Bab-al-Havaej street and just north of a central area of the Bazaar of Kashan, a commercial complex has been under construction since last year, with extensive destruction. This complex is in the northern part of the Bazaar comprising Miyan-Chal school, the Qaisariye district and important Timchehs such as Amin-al-Dowleh and Bakhshi. It seems that this commercial development will pave the way for the evacuation of some of the Bazaar units and their relocation to the outside of the Bazaar. The bigger problem is the spread of this pattern of business development across Bab-al-Havaej street, which could make it a very serious competitor to the Bazaar and provide opportunities for the transfer of activities from the inside of the Bazaar to its outside. This pattern may also extend to the other parts of the Bazaar, including its southern part, because it seems that the construction of new streets is going on in the south of the Bazaar with similar justifications. The demolition of the historical context in this area is ongoing and includes the intention to build a street in the place of the Darb-e-Golan passage. Besides, some houses, other urban elements and a part of the Jewish neighbourhood have been damaged, and this process is accelerating. This new street has also been suggested in urban plans to improve permeability within the historic area.

A preliminary examination of Kashan's Bazaar shows that this critical part of the city is not in good condition. Within the Bazaar, the first problem can be attributed to the inadequate functioning of outlets and elements within the Bazaar. Although a significant amount of the original units is still operating, lack of prosperity and activity is widely visible, even with the arrival of new elements near the units containing spatial quality.

In the area surrounding the Bazaar, the problem has occurred in a broader form in that the Bazaar building has been disconnected from its urban context. Unfortunately, urban plans and the approach to the Bazaar itself are increasing such disruption. Also, the change in the local economy of the city and the decline of manufacturing workshops result from the extensive economic changes of the 1960s and later have turned the Bazaar from being the heart of the historic city into a decaying historical part.

This research seeks to examine how the position of the Bazaar has changed during city construction and development. Studies show a significant relationship between the city's structure and spatial form and social and economic processes. With the expansion of population and the size of cities and the emergence of new urban planning, the physical-spatial complexities in cities increased as well. This meant that understanding the main structure of cities and their morphology based on the analysis of all components of the city became more difficult. Therefore, the analysis of the spatial structure of cities and, in particular, the recognition of the distribution of facilities and services and their impact on socio-economic development of different textures of the city need methods that can respond to these complexities (Abbaszadegan, 2012). One of the theories and methods that study the structure and configuration of urban spaces is Space Syntax method which was selected for this research.

2.2 Literature review

Kayvan Karimi's research on six historical cities, using the Space Syntax method, clearly reveals the importance and the position of the Bazaar in Iranian cities. Karimi seeks to find the spatial logic of these historic cities by studying the spatial structure of Kerman, Shiraz, Hamedan, Semnan, Kermanshah, and Qazvin. Analysing the spatial structure of these cities, he shows that they have a consistent and dense core at their centre, which usually corresponds to the geographical centre of the city. The physical form of the core typically has two structures: linear and grid. However, regardless of the form, the core in all these cities has been the Bazaar. He considers the city's economic core as the most significant Iranian urban space and its social and cultural centre and he terms the Bazaar as "the backbone of the city" (Karimi, K. 1997). Karimi's studies also refer to the Space Syntax method to determine the existing connection between the part and the whole urban network and to explain the ratio between the central core and the entire city. According to his findings, historical cities produce different levels of part-whole correlation. In the city centre, the Bazaar and the main street are the places where the most intense internal and external interactions occur, and where the part-whole connection is very strong. It also shows how the spatial structure has developed in response to community activities. The extent of this relationship is lower in the larger central area around the core than in the centre of the core. However, it is still significantly higher than in residential areas that are usually off-centre (Karimi, 2000). Following the study of the Bazaar and the historic core of the city, Masoudi Nejad studied various typologies of Iranian Bazaars, determined the state of the Dezful and Shooshtas Bazaars by referring to Space Syntax and presented these new findings to categorise the Bazaars in Iran (Masoudi Nejad, 2017).

2.3 Methodology

In this research, the study of the city's spatial structure is carried out by the Space Syntax method. Architects, urban planners, and geographers use geometric language to design or describe artificial and natural environments, as well as to describe and visualise the dimensions, shape, and form of space. These geometric descriptions are usually provided with the help of a map. Because geometry focuses on shapes and sizes, it is inadequate to explain relationships which are non-geometric in nature. This is treated by topology derived from other branches of mathematics. The foundation of topology is based on graph theory, which is concerned with the relationship between the components of a system and how it is configured as a whole, rather than describing the shape of the components (Masoudi Nejad, 2017). Graph theory and topology were used to analyse the artificial environment in the late 1960s and especially in the 1970s. The most important contribution in this regard was made by Bill Hillier whose studies in the 1970s led to the introduction of Space Syntax theory.

Space Syntax is a set of measurement methods that analyse the spatial configuration of architectural and urban scale and its relation to the social structure of the environment (Hillier, 1997). The outcome of this analysis enables the study of features such as integrity and choice. Any changes in the relationship between constituent elements of a city affect and modify these characteristics. Investigating these changes can make it possible to analyse a city's spatial configuration and the changes that have occurred. After examining the relationship between all urban spaces, this method presents the results in mathematical and graphical models (Abbaszadegan, 2002). The aim of the research is to gain a detailed understanding of the relationship between the Bazaar of Kashan and the city. To achieve that the scope of the research extends to three different periods of time during the past and the present century. This is to clarify the changes that have occurred in the spatial configuration of the city in general, the streets, the historic city limits and, in particular, the spatial and commercial position of the Bazaar. To that effect the Space Syntax method is used to study the position of the Bazaar in the spatial configuration of the entire city in the three years of 1920, 1960 and 2010.

2.4 Kashan and its historic bazaar

Beyond its role of historic city, based on the evidence of settlements and civilisations identified in this area, Kashan gets described as a depiction of centuries and millennia of living in one of Iran's central plateaus. In addition to giving a brief overview of Kashan's history, the essential rows and orders of the Bazaar are given particular attention.

2.4.1 Kashan formation and development

Being close to the main commercial and communication routes, Kashan has always been of particular importance, but the region's history cannot be confined to that of today's city. According to Ghirshman's studies, the first biological complexes of the Kashan plain had a natural path to the north and northeast, associated with Sialk residents (Ghirshman, 1939). Apart from Sialk, ancient sites such as Ziarat Castle hill, one kilometer west of Fin garden, which goes back to prehistoric times, indicate a very ancient settlement in the area around 40,000 years ago. Despite numerous habitats and

long records, from the first centuries after Islam and probably earlier during the Sasanian period, Kashan's urban core has been formed in relation to water resources and regional roads. The impact of roads on the body of the initial city and its developments has created an enclosed city with the road extensions shaping the main city passes (Birashk, S. 1996). However, the passage through the Bazaar has long been one of the most critical passages in the city influenced by the road connections and extensions.

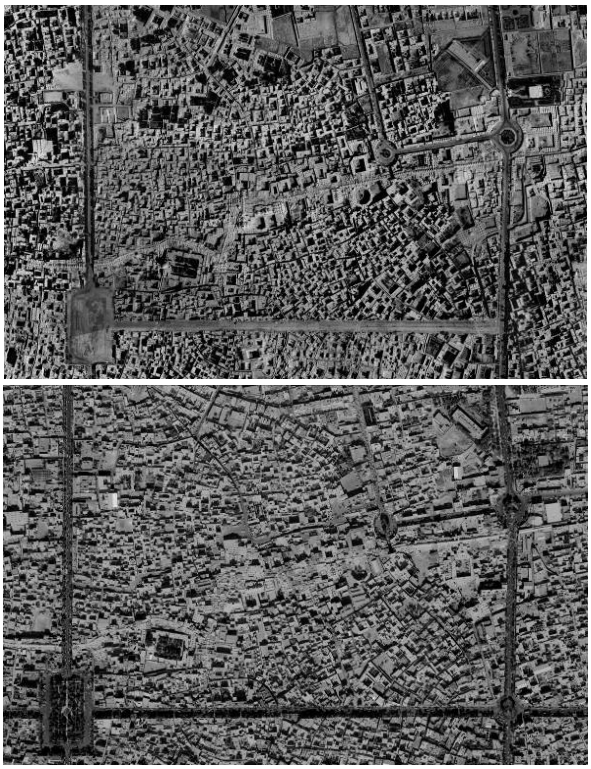

Fig.2.2 Location of the Bazaar in the city of Kashan: The aerial image on the top is from 1956 and the image on the bottom from 1999 (source: National Cartographic Centre of Iran).

2.4.2 An overview of the Bazaar of Kashan: introducing sections, passages, and its important components

The Bazaar of Kashan starts from the Paa-Nakhl passage in the northwest of Kamal-al-Molk square and extends to the Bazaar-e Mesgarha (Copper Bazaar) near Darvazeh Doulat. In the past century, the east end of the Bazaar extended to Abazar street towards the east (Fig.2.2 and 2.3). This demonstrates the importance of the passage of the Bazaar and its development due to the need for indoor space. The Bazaar includes significant segments such as the Paa-Nakhl Bazaar, Gozar-e Now Bazaar (New Passage), Bazar-e Zargarha (Goldsmiths' Bazaar), Bazaar-e Kaffashha (Shoemakers' Bazaar) , Mercers Bazaar, Qaisariye & Miyan-Chal Bazaar, Bala-Bazaar and the Bazaar-e Mesgarha (Coppersmiths' Bazaar) (Fig.2.3). This linear structure, which includes a grid form section between itself and Qaisariye, as well as within Qaisariye contains many sub passages

and elements such as Timcheh, Sarai, and Caravanserai, as well as Mosques, Baths, and Cisterns. In recent decades, especially in the 1960s and 1970s, several marketplaces and passageways have emerged in some segments of the Bazaar, usually together with the destruction of some sections of the Bazaar.

The Bazaar of the early city, now known as Paa-Nakhl Bazaar, located on the south side of the Old Town square (Fig.2.2), reveals the early surroundings of the city. After the arrival of Islam, Kashan's physical development has been along roads leading east and south of the city.

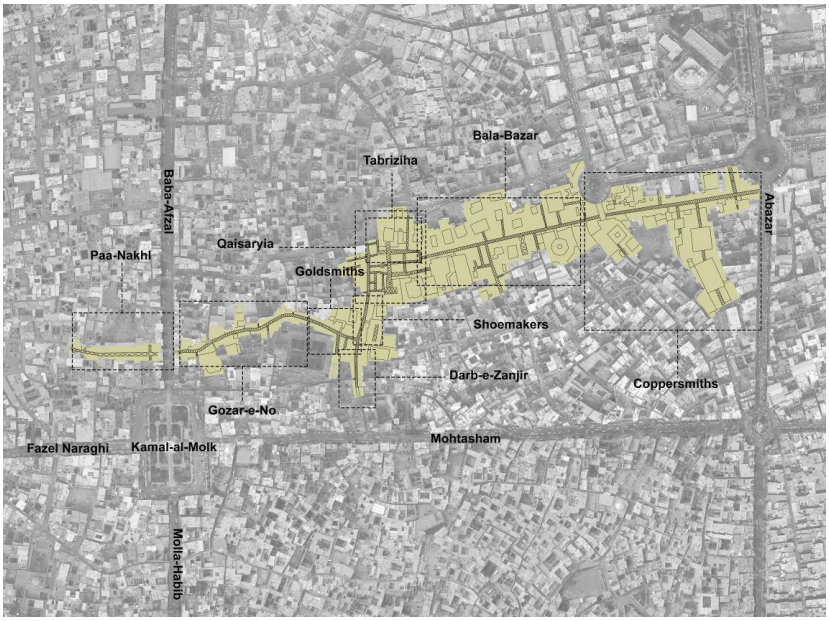

Fig.2.3 The Bazaar of Kashan and its passages (source: authors)

The Bazaar has been flourishing in recent centuries, which is evident from tourist descriptions, such as Adam Olearius in the seventeenth century who reminisced about the extraordinarily beautiful and spectacular Bazaar (Olearius, 1990). However, this growth did not last long. Hassan Naraghi explained about half a century ago that at that time, more than a tenth of the stores of the old Copper Bazaar had few workers (Naraghi, 1966), a situation that is much worse today.

2.5 Evaluation of the Bazaar's status

2.5.1 The Bazaar and its role in Kashan space configuration

An examination of the Bazaar shows that changes such as the roadblocks of the 20th century urban development impacted market performance significantly. The last century was divided into three important and influential moments in time: 1920, 1960, and 2010. These years were chosen to examine these changes more closely. The first moment, 1920, dates back to the time when the city's urban fabric was still intact. The

second, 1960, shows the state of the city after the first changes of the first half of the 20th century. In addition to the relatively modest development of the city of that time, the main streets and Kamal-al-Molk square were constructed. The third, 2010, reveals the construction of streets in the historic area to facilitate traffic, in addition to reflecting the city's extensive developments over the last three decades.

2.5.2 The status of the Bazaar based on the evaluation of the global integrity of Kashan

In 1920, the largest numerical value of global integrity (according to the Space Syntax method) was visible at the market boundary, as well as at another limit where the Kamal-al-Molk field was later built over (Fig.2.4, left). Within the Bazaar the Paa-Nakhl, Darb-e-Zanjir and Goldsmiths passages had the highest degree of integrity, respectively, at that time, while other Bazaar passages, such as Shoemakers, Bala-Bazaar, and Coppersmiths, had a status which was distinct from their surroundings. On the south boundary of the Bazaar, particularly the passage that lies parallel to the Gozar-e-No lane and extends to the right of the Paa-Nakhl (the current boundary of Mohtasham street) had the highest global integrity. At the Paa-Nakhl Bazaar passage junction with the perpendicular Paa-Nakhl crossing, the global integrity ratio reached 0.66 as the climax. According to graph centrality, despite the importance of the Bazaar and its prominent role in the spatial configuration of the city and its eastward expansion from past centuries, the core and heart of the city were inclining towards the western part of the Bazaar, where it was geometrically in the middle of the city.

In the global integrity map of 1960 (Fig.2.4, middle), the highest values were observed in the Kamal-al-Molk square, Mohtasham, and Baba-Afzal streets. Thus, it seems that by building these two streets and Kamal-al-Molk square, the Bazaar had significantly lost its place in the city and was taken over by three new elements of the city. Overall, based on the map of 1960, Paa-Nakhl and Gozar-e-No passages, the junction of Goldsmith's passage with Darb-e-Zanjir and Shoemakers and the Coppersmiths and Bala-Bazaar, had the highest integrity, respectively. As the map shows, this integrity climaxed at the intersections with the cut-off axes of Bazaar's passages, such as Baba-Afzal and Abazar streets. It shows that the two streets, Baba-Afzal and Abazar, have made the Bazaar more accessible, thereby enhancing the integrity of the above sections with the surrounding urban areas.

In 2010, the highest integrity levels were in Rajai and Kashani streets, which were built parallel to the Bazaar and north of it (Fig.2.4, right). After that, Baba-Afzal street and the northern border of Kamal-al-Molk square had the highest amount of integrity. On the same map, the index had fallen within the range of Qaisariya relative to the whole Bazaar. Part of the reason had to do with the fact that it was far from the main streets, such as Baba-Afzal, Abazar, Rajai, and Kashani.

Fig.2.4 Global integrity index of Kashan. From left to right: 1920, 1960 and 2010 (source: authors)

This analysis makes it clear that building a street around the Bazaar thus changing the integrity index and establishing a new network rather than organically building the Bazaar and other crossings made the status of the middle section of the Bazaar unstable, although it was such as essential constraint of Qaisariya. This was despite some parts made available through cut-offs with the streets which enhanced the integrity index. Nevertheless, the potential impacts of the newly renovated Bab-al-Hawaij street should not get overlooked. In particular, it had a more significant amount of integrity than some sections of Qaisariya. In the same year (2010) in the Bazaar, the Gozar-e-No and Paa-Nakhl crossings (at the intersection with Baba-Afzal street) and the Coppersmith's passage had the highest integrity, followed by the Goldsmiths' passage. Therefore, it seems that passages adjacent to the main road paths had a higher degree of integrity than other passages and more active units. The Paa-Nakhl passage was no exception. Its integrity was high because of its junction with Baba-Afzal street, which is also visible in 1920 (Fig.2.4, left). However, on the other hand, the percentage of its active units is the lowest among the others. Nonetheless, the centre-piece pf the Bazaar hosts mourning groups annually which march in the mourning period and typically move from the western part of the city to the Bazaar and the Amin-al-Dowlah Timcheh. It shows that this passage still retains its social value and is reminiscent of its historical past. Therefore, it seems that the cause of the difference between the Paa-Nakhl and Gozar-e-No Bazaar should get sought in the location of each order and its spatial relationship with the surrounding elements, including other sections of the Bazaar. Both the Paa-Nakhl and Gozar-e-No crossings are connected to Baba-Afzal street on the one hand and have the same access from that street pn the other hand. However, what had caused the difference between the two was the other side. Unlike the Gozar-e-No, which connects itself to the Goldsmiths Bazaar and the Bazaar passages of Kashan, the western part of the Paa-Nakhl passage had no relation with any significant part of the Bazaar. Thus, unlike the Gozar-e-No passage, street construction isolated the Paa-Nakhl Bazaar and reduced its relevance to other Bazaar's sections. As a result, regular business activities declined, and this showed that by cutting off a linear Bazaar by one street, although it made one market accessible and enhanced its integrity index, it was also likely to lead to the isolation of the other. This was crucial because the integrity of the Bazaar was at stake.

2.5.3 Studying the choice index

The network access also had to be considered to gain a better understanding of the city's

backbone and examine its core in the three selected moments in time. As a next step of the research he choice index was used to analyse the network access. The calculation of the choice index depends on the connection index, which means the number of relationships of one axis to the adjacent axes.

In the choice map of 1920 (Fig.2.5, left) the distribution of essential passes was spread evenly throughout the city. At first glance, the whole urban boundary was made up of organic highways without direct and long paths. While the outline of the access routes was made up of similar lines, the city's main passages were identifiable through these routes. This indicates that in 1920, the distribution of urban highways was evenly divided throughout the city. According to this map, at least some Bazaar passages constituted the most crucial urban route in Kashan in the early part of the last century. Of course, this was not the same in all the passages. The Coppersmiths and Bala-Bazaar passages had the most significant number of choice indexes, and the rest were approximately equal or close to each other. Therefore, the city was centralised and orientated by the Bazaar, something that remained from the distant past. However, the Bazaar orientation and centrality changed generally in less than three to four decades. By looking at the choice map of 1960 (Fig.2.5, middle), it is evident that in the years that followed, the city continued its existence with the focus on Kamal-al-Molk square and its streets. Thus, it seems that in 1960, the Bazaar was not the heart of the city anymore. Instead, the Kamal-al-Molk square and the new city centre streets defined it, while the Bazaar got marginalised. Some passages, such as the Bala-Bazaar and the Coppersmiths passage, still retained their influence, though to a lesser degree. Rajaie street was also a powerful and influential street in the northern part of the city. Map 2010 (Fig.2.5, right) shows that since the implementation of new urban development plans and the city's rapid expansion, especially to the west and southwest, the core was also removed from the Kamal-al-Molk square boundary.The Amir-Kabir and Qotb-e-Ravandi axes developments were due to the redefined urban role of Kashan, and the urban role of Fin-e-Kochak, and Ravand accelerated the process of conversion. After these changes, the Bazaar no longer played a pivotal role in the development of the city. It seems that the entire Bazaar is now marginalised and spatially valued by other historical boundaries.

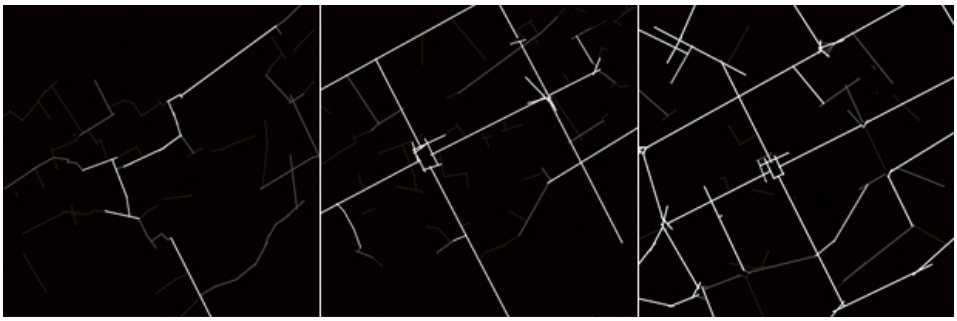

Fig.2.5 Global choice index of Kashan. From left to right: 1920, 1960 and 2010 (source: authors)

2.5.4 Conversion of the Bazaar's role in the urban configuration of Kashan

Figure 2.6 depicts the main mapping of the Kashan integrity core in 1920, 1960, and 2010. Low coherence elements were removed from the map to understand the shape

and the position of the core better, The central core map of the integrity of 1920 (Fig.2.6, left) formed a central Kashan core at the beginning of last century, extending along the western Bazaar as a critical urban structure. At the western end of the Bazaar, there were more divisions in the north and south of the Bazaar. These divisions represented a segment of the Bazaar and urban areas that, in addition to being directly related to the Bazaar, were centralised in the city's geometric centre. The main integrity core map of 1960 (Fig.2.6, middle) shows that in that year, with the construction of the Kamal-al-Molk square and the streets leading up to it, the original form of Kashan was organically decomposed and the boundaries arising from the new roads created new linear centres. Due to these transformations, the Bazaar had lost its integrity and continued a separate life within the confines of the new intersecting streets.

Two significant events took place in the last two to three decades. First, the city's actual core was moved to an urban axis that included Rajai and Kashani streets, which included the Bazaar only at the intersection of the Coppersmiths passage and with Abazar street, as well as at the intersection of the Gozar-e-No and the Paa-Nakhl passages with Baba-Afzal street as part of the subdivision of this new centre (Fig.2.6, right). At the same time, these two streets intersecting the Bazaar had the most significant impact on maintaining the status of the Bazaar as a valuable route, albeit otherwise separated in the light of recent developments. In the analysis with Space Syntax parameters, the passages ending at these paths, such as the Gozar-e-No Bazaar and the Coppersmiths, were of high integrity value (Fig.2.4). However, the newly established Bab-al-Hawaij street (Fig.2.1) overshadowed and reduced their value from the Qaisariya to the Gozar-e-No Passage, while intersecting streets made them accessible and decreased their depths and, at least in the short term, could help their integrity. However parallel streets made them inaccessible and diminished their impacts.

The Bab-al-Havaej street was built in parallel to the Bazaar in the last decade and initially as a secondary route to provide permeability to the historical district and parking needed for the Bazaar. The analysis with Space Syntax parameters found that unlike cross streets, the creation of such parallel streets led to a decrease in the integrity value of parallel crossings with the streets. The maps of 1960 and 2010 show that the amount of integrity in the Qaisariya area decreased and then added to the Bab-al-Hawaij street's integrity.

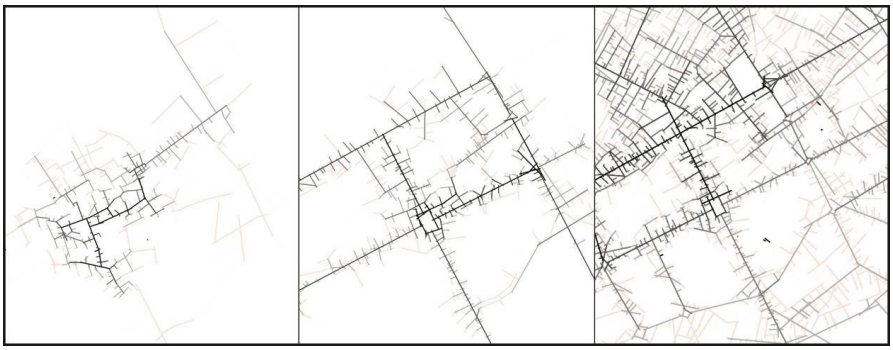

Fig.2.6 The main integrity core index of Kashan. From left to right: 1920, 1960 and 2010 - Lines with a low numerical value were deleted for a better understanding. (source: authors)

2.6 Discussion: evaluating changes in the configuration of the city and its impact on the Bazaar

According to these studies, the streets cutting through the Bazaar do not have the same impact on the remaining two sections on either side. At least on the west side of the Bazaar of Kashan, where Baba-Afzal street cuts the Bazaar, the two sides of the street are different. This assumption is dominant concerning the east side of the Bazaar, where Abazar street separates the Coppersmiths and Sardar Bazaar. There the Sardar Bazaar has economically collapsed to the extent that its roof and arches got destroyed. In both cases, both sides of the streets of Baba-Afzal and Abazar have higher integrity indexes. However, the Coppersmiths and Gozar-e-No passages along broader sections of the Bazaar are not comparable to the others in terms of economic prosperity, i.e. Paa-Nakhl and Sardar. However, building parallel streets with passages has a different impact on the Bazaar components. In the following section, the results of the analysis are reviewed and evaluated to clarify what type of impact of the elements added to the city's configuration.

With the creation of Mohtasham and Baba-Afzal streets, the integrity of the Gozar-e-No passage was reduced over the whole city (Table 2.1). It seems that the reason for the slight decrease in the global integrity index should be traced back to the Baba-Afzal street intersection. Because that street made the other street accessible, although not in proportion to the spatial pattern of the city. It is necessary to carry out evaluations based on the local integrity index to avoid a false influence of the development of the city's spatial structure on the evaluation of the integrity of a particular Bazaar passage. The purpose here is not to evaluate the status of a single passage in terms of global integrity, but to examine the change of its local status concerning the most important influential elements, such as the new streets surrounding it. Accordingly, unlike global integrity in 1960, the level of the local integrity index increased slightly (Table 2,2); the reason for this can be attributed to the impact of the junction of Baba-Afzal with Gozar-e-No passage and its boundary. Due to the impact of Mohtasham street in 1960, the Gozar-e-No passage has faced a decrease in the whole city's configuration. However, on a local scale, its integrity has increased due to its direct connection to the main street.

Table 2.1 The numerical value of the global integrity index of Gozar-e-No passage in 1920, 1960 and 2010 (source: authors)

Value of global integrity index	1920	1960	2010
The average global integrity of the Gozar-e-No passage area over the total average	1.346	1.344	1.257

Table 2.2 The numerical value of the local integrity index of Gozar-e-No passage in 1920, 1960 and 2010 (source: authors)

Value of local integrity index	1920	1960	2010
The average local integrity of Kashan	1.038	1.170	1.463
The integrity index ratio of Gozar-e-No passage to the city's average	1.327	1.333	1.157
The integrity index ratio of Bala-Bazaar passage related to the city's average	1.968	1.702	1.446

The assessment of integrity in 2010 revealed a significant decline. The global integrity index of 2010 was associated with a more significant decline than in 1960 (Table 2.2). The causes of this decline appeared to be the shape of the urban development and its direction of its physical centrality around the historical boundary. Numbers shows that the local integrity index slope was much lower than that of the global integrity. The cause was due to the changes which occurred in the vicinity of the Gozar-e-No passage, where the new street of Bab-al-Hawaij was formed and expanded by demolishing portions of the texture and connecting existing passages in a parallel street to the Gozar-e-No passage. For a further investigation of the impact of the new streets on the Bazaar position in the city configuration, it was necessary to examine and evaluate the previous findings on the impact of Baba-Afzal and Bab-al-Hawaij on the eastbound of Gozar-e-No passage. Bala-Bazaar and its eastern extension called Coppersmiths which formed a strong axis of Kashan's configuration of 1920. This axis was cut off at the eastern end of the road by the new Abazar street. Table 2.2 shows the extent of local integrity of this axis in 1960, despite the construction of the cutting Abazar road. The cause was found in the parallel and adjacent street of Afzal (Reza Abbasi), which was built very close to the Coppersmiths passage and connected to the vital axis of Rajaie street through the present state of Stone square. Evaluation of local integrity in 2010 (Table 2.2) also shows that the index for the axis comprising the two right-angles of Coppersmiths and Bala-Bazaar has decreased with the same slope as during the first half of the present century. The role of Bab-al-Hawaij street, completed in the late 2000s, was to connect Stone square to Baba-Afzal street on the west side of the Bazaar. An essential part of this street, located on the east side, is parallel to the Bala-Bazaar passage.

Another issue that becomes clear from the results of the Space Syntax analysis is the changes in the city's structure or spatial configuration as a result of the construction of the streets. While the results of the Space Syntax analysis represent the Bazaar of Kashan at the beginning of the present century as the backbone of the city (Fig. 4, top), the map of the city's status in 1960 (Fig. 4, middle) shows that the city was built from an organic network based on interconnected passages and routes, while a secondary structure consisting of two perpendicular axes comprising the streets of Baba-Afzal, Mohtasham, Fazel-Naraqi, and Molla-Habib-Allah was changed. As the outcome of the depth index graph shows (Fig. 2.7), large portions of the urban texture were removed from the new space configuration, and the 1960 Kashan was represented more than

any other element by relying on the two streets and Kamal-al-Molk square where they intersect.

Fig.2.7 The depth index graph in 1960: the bolder the lines, the higher the depth. More depth means being more inaccessible (source: authors)

Therefore, it seems that the streets along the two axes of Abazar and Rajaie streets have created a secondary grid space configuration for the historic city, which included deep-seated neighbourhoods. In 1960, both the depth graph in 1960 (Fig.2.7) and the choice graph (Fig.2.5, middle) and the integrity core (Fig.2.6, middle) revealed how large parts of the city diverged from their original spatial structure and got isolated. However, the same graphs point out that only the central sections of the Bazaar were significantly deep and thus inevitably isolated, while significant parts retained their prominence despite influential rivals, such as the streets built up to 1960. Probably, the cause resided in the survival of the overall configuration of the historical city within the city of 1960. A survey of aerial photography of Kashan in 1956 and a comparison of axial maps of the city in 1920, 1960, and 2010 (Fig.2.8) show that by 1960 the overall shape of the historical city was retained to a considerable extent and that the streets were merely adding new spaces to the old boundary of the city.

The graph of the global integrity index in 2010 (Fig.2.4, right, as well as Fig.2.9) and the graph of the global integrity core (Fig.2.6, right) show that in addition to affecting the streets of Baba-Afzal, Mohtasham, Fazel-Naraqi, and Abazar, the role of the Rajaie, Kashani, and Beheshti streets grew at the core of the integrity of the city, and the spatial configuration of the city took on a new form without symmetrical relation to the boundaries of the historical city. In particular, two major urban axes, namely Amir-Kabir street to Fin and Qotb-e-Ravandi boulevard to Ravand, shaped neighbourhoods within the

urban space between them and drove the city's development to the west and southwest. This direction of development which grew in contrast to the historic city isolated the Bazaar further. The isolation encountered by the Bazaar was not due to the most important neighbourhoods and the city's organic construction, but only to the dominant streets, such as Baba-Afzal and Abazar, and the newly transformed urban fabric. That is why the passages facing the Bazaar continue to thrive, and other rows are rarely lost. In such a situation, it might be considered that the construction of new and parallel streets, such as Bab-al-Hawaij street, would be the solution. However, such streets would make the Bazaar's various sections deeper and thus the situation worse.

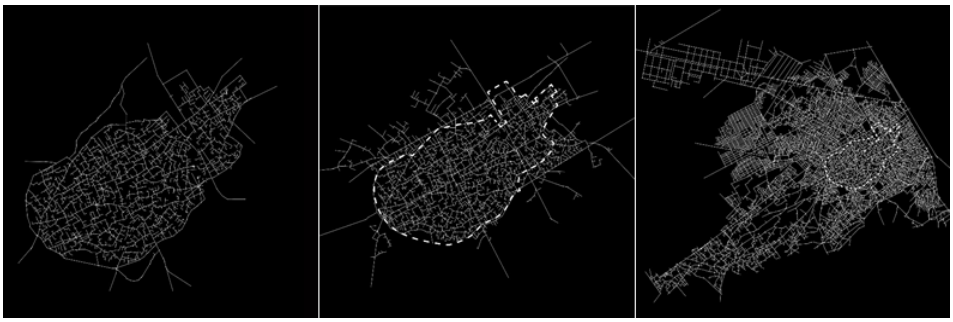

Fig.2.8 Axial map of Kashan. From left to right: 1920, 1960 and 2010 - The city's boundary in 1920 are reflected on the axial maps in 1960 and 2010. (source: authors)

Fig.2.9 Integrity index graph of the whole city of Kashan in 2010 (source: authors)

At present, it is not possible to do anything to the main streets perpendicular to each other (Baba-Afzal, Mohtasham, Fazel-Naraqi, and Molla-Habib-Allah) because many years have passed since their formation, but a solution must be found for the newer streets that are being built. For example, the development of commercial activities on Bab-al-Hawaij street should be stopped, and beyond that, the street should become a place for the development of pedestrian axes to increase the flow of the people through

it and to the historical Bazaar. Studies show that building a support and service centre for the Bazaar to expand the activities of traditional arts workshops and produce handicrafts can help revive parts of the Bazaar that have lost their function. Space Syntax studies show that if this centre is built in the middle of Bab-al-Hawaij street and turns this shortcut street into two dead-end streets, the Bazaar position in the Kashan spatial configuration will improve.

2.7 Conclusions

Building any street or network of streets can have a complex impact on a historic city's urban context. Understanding this impact requires examining how it affects the configuration of the city, as well as an awareness of social or economic change. However, this issue is followed here only from the perspective of the city's spatial structure. The fabric of a historic city must indeed keep pace with the process of modernisation, to meet new needs of residents and to develop vulnerable areas and provide better access to them in case of disaster. However, this should not be accompanied by excessive interventions, repetitive patterns of urban development and profound changes of the characteristics of the city and its urban context. Projects of rebuilding and reviving a historic city should not become an excuse for extensive and destructive transformations.

This research has found that as Kashan's urban structure got removed from its organic state its global urban integration tended to move to more straight and long streets. Topologically more accessible and with high selectivity they became the most important routes in the city with the most traffic to reach critical urban centres. The streets crossing the centre of Kamal-al-Molk square, which together were the main core of the city in 1960 provided also a new space configuration for the city, resulting in the deepening of historical sections, including the Bazaar.

In the following decades, this process, together with the importance of other streets, including the direct axis of Rajaie, Kashani, and Amir-Kabir streets, transformed the organic configuration of Kashan into a grid-like structure superimposed on the historic city. As a result, the grid has transformed into the city's integrity core and the global and local integrity in historic areas. The development of the city and the streets also led to the transformation of the city. Often developed in a western and southwestern direction, this moved the historical Bazaar boundaries away from the city's integrity core and into isolation. At a smaller scale, it is also essential to consider the role of streets and their impact on adjacent passages. Findings of this research show that cut-off streets through the Bazaar passages, may have increased the integrity index of these passages in the short term, but this increase in integrity should not be seen as an increase in their performance. Other factors such as location and history also played a role and, more importantly, crossing passages along with an increment in integrity index influenced the Bazaar's integrity and, in particular, isolated part of it. The discussion of the integrity of the Bazaar and its integration into the urban environment showed that the impact of the streets around the Bazaar was affecting its integration, both by separating the Bazaar from its urban context and separating its elements.This was also the case for the Paa-Nakhl Bazaar and its isolation. Perhaps another critical example was the boundary of the Char-Souq Bazaar. Although at its heart it is not far off the streets, in 2010 its integrity index declined and its economic buoyance was in jeopardy. According to these

research findings, there is a need to study the new city form itself and to reconsider the development directions which are outside the scope of this chapter. Until the historic city's ratio to the new city is modified, it is important to avoid small as well as significant developments by widening the historical routes and to try instead to redefine the relationship between the Bazaar and the city's historical elements around the Bazaar and the existing streets as a whole.

The research sought to answer how the spatial configuration of Kashan, including the construction of streets, impacted the Bazaar's position. It was carried out without regard to the cultural and social aspects of the Bazaar and its relation to the limited urban features around it. Although Space Syntax helps improve the analysis of an urban area's spatial structure, it alone cannot respond to the different behaviours in an organic context that are heavily influenced by social and cultural factors. Therefore, social and cultural analyses of the context have to complement the findings of this study. Finally, it should be noted that this research is not against interventions in historical sites but believes that before any interventions, all their aspects and effects on these areas must be well understood and reflected upon.

References

Abbaszadegan, M., 2002. *Space syntax method in the urban design process by looking at Yazd city*. Urban Management, No. 9, spring, 64-75.

Abbaszadegan, M., Mokhtarzadeh, S., Bidram, R., 2012. *A study of the relation between the spatial structure of the city and the quality of urban development using Space Syntax A case study of Mashhad.* Urban – Regional Studies and Research Journal, 4th Year, No. 14, Autumn, 43-62.

Birashk, S., 1996. *The process of development and evolution of Kashan in the context of history.* Tehran, National Heritage Organization.

Ghirshman, R., 1939. *Fouilles de Sialk pres de Kashan 1933,1934, 1937*. Paris, P. Geuthner.

Hillier, B., 1997. *The Reasoning Art or the Need for an Analytic Theory of Architecture*. Space Syntax First International Symposium, 3-4.

Karimi, K., 1997. *The spatial logic of organic cities in Iran and the United Kingdom*. Proc. Space Syntax 1st Intl. Sym, London, Volume I, 1-17.

Karimi, K., 2000. *Urban conservation and spatial transformation: preserving the fragments or maintaining the 'spatial spirit'*. URBAN DESIGN International, Volume 5, 221-231.

Masoudi Nejad, R., 2017. *A Comparative Study of Social and Retail Bazaars: Investigating the Historical Bazaars of Dezful and Shushtar as Retail Bazaars*. JIAS, 1 (10), 73-100.

Naraghi, H., 1966. *Social History of Kashan.* Tehran, Institute for Social Studies and Research.

Olearius, A., 1990. *Adam Olearius's Travelogue: Volume II*. Kordbache, H. Tehran, Book for Everyone.

Local heritage to build resilience

The case of Arquata del Tronto in the Marche Region

Enrica Petrucci, University of Camerino, Italy enrica.petrucci@unicam.it

Lucia Barchetta, University of Camerino, Italy

Diana Lapucci, University of Camerino, Italy

Abstract

Recent seismic events have caused extensive damage to cultural heritage in the inland areas of the Marche region of Italy, showing the extreme fragility of the territorial system, with strong consequences on the economic and social context. In historic villages, the high seismic vulnerability of the buildings has caused the most significant damage; it is particularly complex to apply regulations and design tools there, aimed at protecting and preserving historical-cultural values; the strategies of re-building are also very complex. Therefore, it is necessary to start from an expansive knowledge of the peculiar features of the historical system of the central Apennines, mostly unknown, to identify recurrent types and techniques through which the foundations and subsequent development of the buildings were laid.

In the present research, a methodology is proposed for an evaluation of the resilience of historic villages, analysing in particular historical building techniques, to verify their effectiveness for seismic purposes and to propose an increase in safety, on which to base conscious reconstruction. The aim of the research is to propose sustainable measures, both from a technical and an application point of view, considering the historical and cultural value of the buildings. In general, the development of specific risk assessment methodologies is necessary to propose strategies to increase the resilience of historic centres. With this purpose, the area of Arquata del Tronto is taken as a case study. The territory is rich in ancient testimonies, tangible and intangible assets. It's a stratification of cultural and figurative elements, which start from the pre-classical age and, through the Middle Ages, up to the modern age, in a continuum of life and agro-silvo-pastoral activities. The different post-earthquake situations therefore require the development of a complex and articulated strategy to build resilience, that considers the specific local conditions.

Keywords: Earthquake, Heritage, Resilience, Arquata del Tronto, Italy

3.1 Introduction

This work presented here is the result of research carried out on the Arquata del Tronto area that began before the seismic events and was carried out in collaboration with the local administration after the earthquake for preliminary studies related to the planning of a recovery plan for the city. The complexity of the territory, already in strong crisis before the seismic events, was analysed, highlighting a series of still open questions. For the purpose of imagining a scenario of reconstruction of the historical centres that characterise the territory of Arquata del Tronto, it is necessary to take into consideration the local identity, because this identity and the local relations constitute a resource and a source of development, on which to rely when community members face a natural disaster. Therefore, within the general study an in-depth knowledge of the features of the places was launched. A "repertory of memory" has been prepared, as a representation of the past and a prefiguration of the future to identify the system of signs that a territory recognises as identity. The research activity concerns the aspects inherent in the assets of historical and artistic interest in the territory of Arquata del Tronto and its constituent parts. It derives data on their consistency and quality as a basis to propose an abacus of the characterising elements, accompanied by the "Linee Guida" (guidelines) for the interventions. Many villages have suffered significant damage in these areas without being completely destroyed. In this case we are speaking of "restoration", meaning with this term a series of operations ranging from consolidation with improvement of buildings to the reconstruction of collapsed parts. The reconstruction of other historical centres, strongly damaged or destroyed raises the question of being attentive to the return of their lost values. To that effect, it is necessary, scientifically, to find those elements of identity that represent reality value of these places. This knowledge will permit to restore the structure of these centres before seismic destruction and in their most mature state, as it was before the numerous and widespread transformations that have altered their architectural and urban quality over time.

For many of the destroyed or severely damaged sites, it will be necessary to identify a qualitative criterion of reconstruction. In some cases, this means minimum interventions, to improve the accessibility and the security of the context. In other cases, reconstructions with the same volumes and on identical sedimentary areas are conceivable, referring to a repertoire of identity elements. In particular cases, a new volume may be proposed, preferring contemporary solutions that open the way for new local development while ensuring the preservation of identity values. For those villages that are completely destroyed, it is a question of implementing a series of actions for the preservation of memory that enable us to evoke the village that no longer exists in a different and more evolved context that guarantees better living conditions for its citizens, with new resilience capabilities.

Recently, in literature there has been a tendency not only to focus on possible risk factors, but also to turn attention to variables capable of supporting a comprehensive development path. In this sense, the capacity for resilience can be transformed into opportunities, giving rise to positive change. In this research, the "capacity of resilience" tends to be defined as the ability to "recover memory" to define a new identity. With reference to international strategies for disaster risk reduction, it is necessary to mention the "Hyogo Framework for action from 2005 to 2015" and "The Sendai Framework for Disaster Risk Reduction 2015-2030". The latter outlines seven clear targets and four

priorities for action to prevent new and reduce existing disaster risks. It aims to achieve the substantial reduction of disaster risk and loss of lives over the next 10 years. The United Nations "International Strategy for Disaster Reduction (UNISDR)" developed "The Ten Essentials of the Making Cities Resilient Campaign" including aspects of local governance, financial and technical resources, policies and plans, and participation and engagement of citizens.

Multiple descriptive statistical techniques were used to analyse the ordinal data. Content analysis, a form of thematic analysis, was used to identify key challenges, opportunities and recommendations, based on the comments given by respondents; numbers 4 and 10 are particularly taken into consideration in this research. In this context, the research is making use of specific models, methods and analyses to simulate the effectiveness of vulnerability reduction systems.

3.2 Methodology

The inland areas of the Marche region are showing extreme fragility of its territorial system, with strong consequences on the economic and social context. It is necessary to start from an expansive knowledge of the peculiar features of the historical system of the central Apennines, mostly unknown, to identify recurrent types and techniques through which the foundations and subsequent development of the buildings were laid. Through these analyses it is possible to derive the necessary elements to guide a conscious reconstruction of the founding characteristics of the places, in order to develop new resilient strategies.

The preliminary phase of the research focused on an accurate historical-archival survey of the sources, to try to reconstruct the development of the analysed historical centres and any interventions that determined the level of damage following the 2016 earthquake. This enabled us to recognise the values (historical, architectural, structural, material, colour, etc.) that can guide the design of reconstruction interventions, while identifying the parts and elements to be preserved or reintegrated, and those that can be transformed and / or reinterpreted.

In a first phase the methods of carrying out the research activities were determined to identify an approach to the topic that could make a significant contribution by analysing the current state of the selected places. In particular, the historical cadastre "Pio Gregoriano" was consulted (all the available updates, indicatively datable between 1820 and 1881). There was also critical reading of the Brogliardi, preserved in the State Archive of Ascoli Piceno. Thanks to the computerised Imago project of the State Archives of Rome, it was possible to consult the original cartographies deposited in the archival office of Rome. Some photos and period sketches were consulted to reconstruct the state of places in history. Most photos were found at the Iconographic Archive of the Municipality of Ascoli Piceno.

The empirical research began with a series of inspections in all the thirteen hamlets that make up the Municipality of Arquata del Tronto, to reconstruct a picture of the post-earthquake situation. The recognition of the construction elements made it possible to assess the extreme vulnerability of the architectural heritage, especially in relation to the techniques used in history that are far from respecting the "state of the art". Among

the vulnerabilities, there are those associated with modern reinforcement interventions (masonry roofing, reinforced concrete curbs) but also pre-modern (non-effective wooden or metal tie bars). These features were mapped and described in a critical manner. Where possible, the survey was accompanied by a geometric-architectural survey for a more in-depth metric and formal knowledge.

The complexity of the district of Arquata del Tronto (Fig.3.1), already in major crisis before the seismic events, has been analysed, highlighting a series of issue.

Fig.3.1 The network of historic villages of the in the territory of Arquata (source: authors)

For many of the destroyed or damaged sites, it will be necessary to identify a qualitative criterion of reconstruction. Some cases require only minimum interventions to improve the accessibility and the security of the context. In other cases, reconstructions with the same volumes and on identical sedimentary areas are conceivable, referring to a repertoire of identity elements (Fig.3.2). In particular cases, a new volume may be proposed, preferring contemporary solutions that open the way for new local development while ensuring the preservation of identity values (De Felice, Pugliano, 1993).

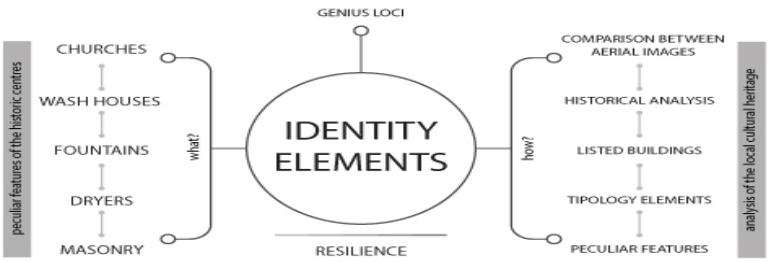

Fig.3.2 Research model (source: authors)

3.3 Case study: the territory of Arquata del Tronto

This research focuses on three different historic centres of the territory of Arquata del Tronto which have very similar features but really different post-earthquake situations: Arquata (chief town), Vezzano and Pescara del Tronto. The different post-earthquake situations therefore require the development of a complex and articulated strategy to build resilience that takes into account the specific local conditions (Fabbrocino, et Al., 2016).

The territory is rich of ancient testimonies, tangible and intangible assets. It is a stratification of cultural and figurative elements, which start from the pre-classical age and, through the Middle Ages, reach up to the modern age. All the historic centres have a poor architecture, responding to the economics based essentially on agriculture. The most important building in each of them is the church, whose prevailing typology is that with a single nave without an apse or with a little accentuated apse. The facades have a very simple decoration and the three portals modified over time have different configurations (Fig.3.3).

Fig.3.3 Churches in Arquata del Tronto. (source: authors)

The survey on the territory of *Arquata* started with a study of those worthy of particular architectural interest reported by institutional sites (MiBAC and Marche Region). Each of them was assigned a colour, red for the bound property, yellow for those deserving of interest but without specific protection obligations. To these was added a further "minor" category, identified during the inspections, to which a green colour was assigned. These assets were chosen for constructive, architectural or decorative continuity. In addition to the main elements of the architectural heritage there is a set of minor elements that are related to local traditions:

a) **Memorials:** this typology has been erected in many cities and towns of Italy in memory of those who died in the First World War, taking on a value that goes beyond the artistic form, rich in symbolic meanings largely unknown in traditional monumentalism.

b) **Wash Houses (Lavatoi):** places where people used to wash their clothes or supply water. They form part of thousands of other minor architectures, the result of spontaneous planning, closely related to the needs of local communities. For this reason, the study of the Lavatoi linked to the use of water is interesting, both as a rediscovery of a systematic framework of solutions distant from the codified models, and for the purpose of understanding the ways in which these architectures fit into the landscape.

c)**Dryers (Essiccatoi):** poor buildings used to dry food in order to preserve it; since ancient times, drying has been the most used method for food preservation. The architecture conformed to this need, through the creation of underground cavities but also of rooms on the upper floors of residential buildings. These rooms were left open to the outside through wooden grilles, with inside wooden accessory structures useful for the ignition of foodstuffs. The size of these rooms was such as to allow the preservation of food for the use of a family community (Figure 3.4).

Very peculiar are also the **access portals** (Fig.3.5) to the buildings. There a certain homogeneity can be found. In particular, the round-headed portals are very widespread, with decorations and shaped keystones, often made of local stone, travertine or sandstone. Conversely, new buildings have only a travertine frame, and the geometry also undergoes a clear simplification. The only exceptions are the representative buildings, almost all for civic use, which have more articulated geometric forms instead and richer architectural features.

3.4.1 The main historical centres of the territory of Arquata

Thirteen hamlets are located in the analysed area with the main hamlet *Arquata del Tronto* in the middle (Carfagna, 1996). Each of them has evident features that refer to a long and articulated local tradition (Borghi, 2017). This territory is relevant in terms of nature and rich in testimonies of the past. It is a stratification of cultural and figurative elements, which start from the pre-classical age through to the Roman age, the Middle Ages and up to the modern age. Unfortunately, this is an area that has been hit over history by substantial seismic events that have contributed to leading to a situation of extreme fragility (Bucciarelli, 1982).

Fig.3.4 Examples of dryers in Arquata del Tronto. (source: authors)

Fig.3.5 Examples of portals in the historical centres of the area (source: authors)

The most recent events took place between 2016 and 2017. They began in August 2016 with epicentres located between the upper Tronto valley, the Sibillini Mountains, the Monti della Laga and the Alto Aterno Mountains. The first strong earthquake of the 24th of August was characterised by a magnitude of 6.0, with its epicentre in Accumoli and hypocentre at a depth of 8 km. The duration was 15-20 sec. During the night numerous shocks were recorded in the area of Norcia and in the Rieti area, among these several higher than the 4th grade. In the municipalities of Amatrice and Arquata del Tronto damage equal to the X degree of the European Macroseismic Scale (EMS) has been reached. Two strong earthquakes took place on 26 October, with epicentres between Visso, Ussita and Castelsantangelo sul Nera. The first earthquake was characterised by a magnitude of 5.4, while for the second a magnitude of 5.9 was recorded. On 30 October 2016, the strongest magnitude 6.5 was recorded with its epicentre between Norcia and Preci, in the province of Perugia. On 18 January 2017 a new sequence of four strong shocks of magnitude over 5 and epicentres located between Montereale, Capitignano and Cagnano Amiterno took place.

The places affected by these events lie in a very active seismogenic area, already characterised in the past by phenomena of considerable magnitude. The main events which occurred in the past are those of 1328, 1703, 1730, and 1859 (Boschi et Al. 1995). During the twentieth century, minor damage occurred, such as the 1915 earthquake that destroyed the city of Avezzano, causing several collapses even in the Arquata area. After the 1997 earthquake, the area did not suffer significant damage, although some interventions were undertaken, following the procedures identified by the Marche Region, mainly oriented to seismic improvement of the structures, especially for those of significant historical-artistic value.

Currently the situation of the centres is very diversified. Three examples have been taken into consideration. The first is Arquata del Tronto in which a substantial removal of collapsed buildings was carried out, but where evident signs of the oldest nucleus remain where new reconstruction was added. Secondly, Vezzano is a small hamlet composed mainly of buildings that, although damaged, are still standing and for which restoration work is conceivable; Thirdly, Pescara del Tronto has totally collapsed and it is impossible to hypothesise an in situ reconstruction for it, despite the fact that positive requests have already been made that require its rebuilding. These examples are illustrated below to understand how the reconstruction strategy should be measured in this specific case, representing each of the Arquata centres as a particular situation (Galiè, Vecchioni, 2006; Lalli, 2017).

3.4.1 Arquata del Tronto (main centre of the municipality)

The main centre of Arquata del Tronto is strategically located on a rocky outcrop in the border strip that still acts as a hinge between the Marche, Lazio, Umbria and Abruzzo. In the middle of it there is the Umberto I square dominated by the tower on which the memorial of the Great War was placed (Mandolesi, Ferrero, 2001). The square was the heart of the town as the most important city events are held there and it is located between the main public buildings (Fig.3.6).

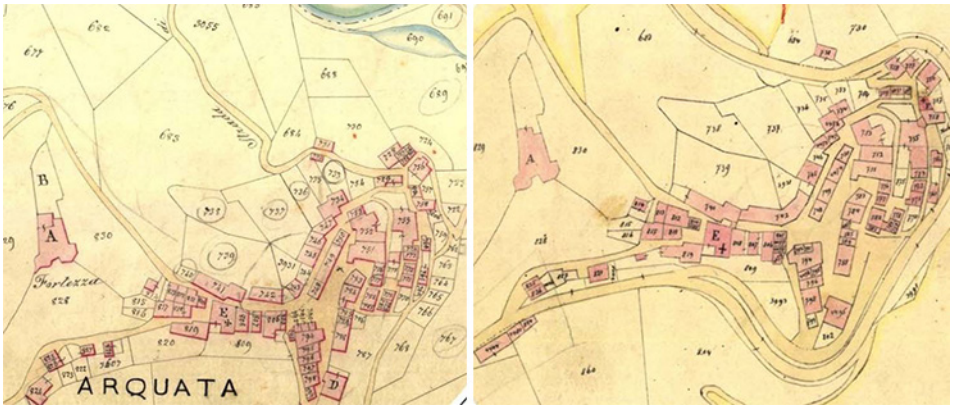

Fig.3.6 Catasto Pio Gregoriano, a.1820 c. and subsequent Catasto, a.1881

Currently, the surrounding buildings have been demolished while faint signs of their plane-altimetric formation have been preserved (Fig.3.7). In the case of Arquata, the central square offers a space of high symbolic value for the community, becoming a sort of lighthouse of memory to remember the effects of the earthquake and those who lost their lives after the building collapses. In dealing with the theme of a conscious reinterpretation of places hit by the earthquake, some useful reflections can be developed whose fundamental issue are considered the architectural and urban relationship included between pre-existence, although mutilated and fragmented, and new interventions. These can be graduated in a real restoration, more or less reintegrated in various forms of reconstruction, oscillating between the operations according to "how it was and where it was" or the most current methods of intervention.

Fig.3.7 Arquata del Tronto faint signs of Umberto I square where plane-altimetric formations have been preserved. (source: Francesco Riti)

The project is focused on the reconstruction of the buildings surrounding the square of Arquata del Tronto. It has sought to identify the tools for an intelligent, sensitive and historically conscious reconstruction of the need for a reinterpretation act, through new linguistic codes. More than the abstract preservation or the pseudo-mimetic reproduction of the pre-existing ones, the path pursued was of a reconstruction of the "civilisation of a place", composed of immaterial culture and updated ways of life and work, through a richer architectural narration, ancient as well as contemporary (Varagnoli, 2013; Serafini, 2017). The proposal for Arquata based on the total reconstruction of the square started from identifying its character. The new construction project is developed on the ground footprint of the previous volumes, based on the presence of the portals as identity elements and the relationship of the buildings with the landscape (Bartolomucci C., et Al., 2012; Amoroso et Al., 2014). This could be an example of Rebuilding without forgetting who and where we are (Fig.3.8).

Fig.3.8 Square Umberto I: Hypothesis of reconstruction (source: authors)

3.4.2 Vezzano

The village of Vezzano is located at an altitude of 645 m above sea level and can be reached by a road that branches off directly from the SS Salaria, which is a few hundred meters away. It is located near a forest and near a small water spring. This position had been chosen since its medieval foundation to accommodate the direct necessities of sustenance of the inhabitants. It is located directly below Arquata and, along with a few other centres, suffered in a limited way from the earthquake of 24 August 2016. The damages to the buildings are quite contained and are due to the event recorded on 30 October 2016. The lack of serious damage was confirmed by the inspection. Most of the particularly significant damage occurred to those buildings that were already in bad condition due to neglect and lack of maintenance. Vezzano is made up of single-family terraced houses with an external staircase with a central portal and an internal stair-

case to serve the various floors (2 or 3 on the basis of residential height differences are concentrated on the upper floors while the basements and ground floors are livestock shelters and warehouses). The starting point for the characterisation of Vezzano was the historical analysis, through the study of the historical maps dating back to the 19th century. From the representation of the Gregorian Cadastre of 1820-30 (Fig.3.9) we see how the building of the hamlet of Vezzano is essentially a historical one, made of multi-storey buildings and of a collaborative place on the periphery of the built spaces.

Fig.3.9 Catasto Pio Gregoriano, a.1820 c. and subsequent Catasto, a.1881

The 1881 update brings us back to the saturation of some voids, especially in the western part of the countryside. In the eastern part, what used to be a fork in the secondary road tends to lose importance. The buildings facing it advance towards the street front with a further portion of building. From the comparison with the recent maps it has been possible to give a characterisation of the inhabited area based on the age of the buildings. The research also tried to identify the successive modifications and necessary elements to understand what the possible critical issues of the buildings are at present (Figs.3.10 and 3.11).

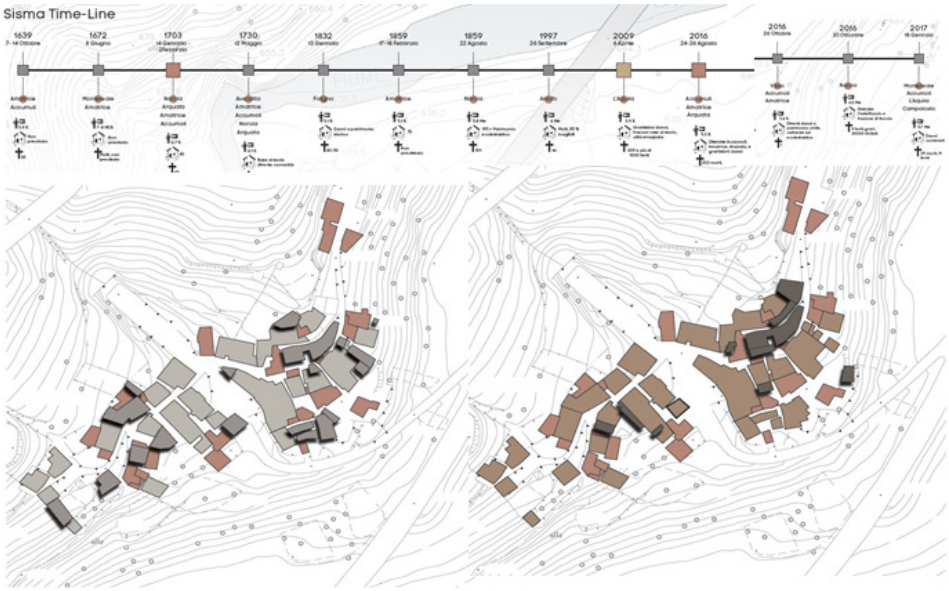

Fig.3.10 Modifications of Vezzano through the years related to the different seismic events (source: authors

Fig.3.11 The damage of Vezzano after the 2016 seismic events (source: authors)

The typological element in Vezzano were then extrapolated: the portals and the entrances with *"profferlo"* (type of external staircase, ending with a gallery supported by an arch, characteristic of medieval architecture). The whole elevations with a series of portals are all different from each other, some of them re-used in a modern way, others probably disfigured by today's needs. The examples shown refer to the round arc, set on key segments often decorated with a regular octagon, and with a keystone sometimes shaped, others only carved. The materials used are local ones, ranging from very widespread sandstone to more limited travertine and some examples of tuff (Figs.3.12 and 3.13).

Fig.3.12 Repertoire of the elements that characterise the buildings in Vezzano (source: authors)

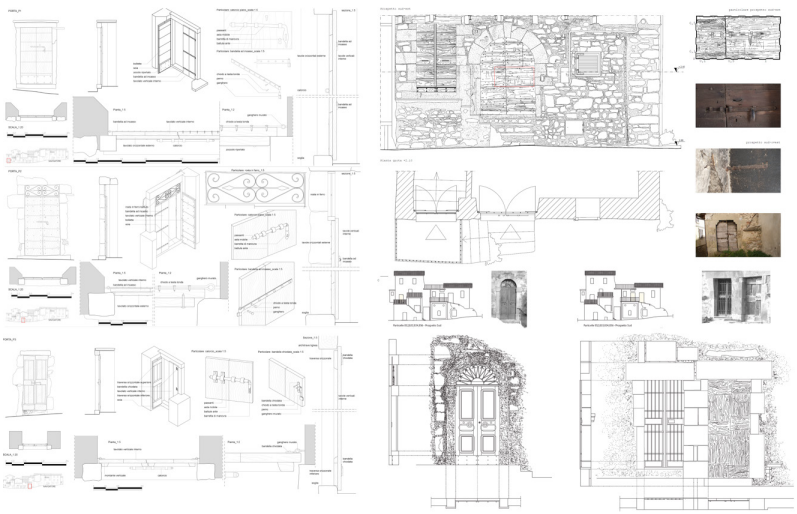

Fig.3.13 Repertoire of the elements that characterise the buildings in Vezzano (source: authors)

Windows consist of a single structure supporting architrave, made of sandstone. In cases where the opening was carried out later than that of the construction, there is an insertion of wedges in bricks, used as a window frame. There are few balconies. Some more representative examples use beams and vaults, with a decorated wrought iron balustrade (Zampilli and Brunori, 2018). An accurate analysis of the masonry we carried out showed a widespread use of local materials, such as sandstone or river pebbles. Some elements are arranged in pseudo-regularity of horizontal courses, while there is a tendency to respect the phase shift of vertical joints. Cantonal corners are generally made of more squared and broader stones. No internal ligaments are observed in the thickness of the masonry (*diatoni*). The only regulatory elements consist of wooden elements inserted inside the walls (dormienti). The construction "magisteriums" are however far from respecting the "regola dell'arte" (rule of art) and results are tied to spontaneous constructive practices. (Fig.3.14).

Fig.3.14 Analysis of the masonry in the buildings of Vezzano. (source: authors)

The analyses conclude with an interpretation of the damage suffered during the earthquake. There were several collapses and many damages. Aggregate behaviours are generally complex and poorly codified. The understanding of the activated mechanisms, however, appears fundamental to the perspective of acting with interventions aimed at improving the seismic behaviour of historical buildings. The various project proposals made for Vezzano aim at maintaining the heritage of the historic centre, repairing it, together with seismic damage improvement and redevelopment of the territory through the enhancement of activities in the territory (Fig.3.15).

Fig.3.15 Project proposals for Vezzano. (source: authors)

3.4.3 Pescara del Tronto

The origin and the foundation of Pescara del Tronto, from whose aqueduct comes the mountain water that serves the entire province of Ascoli Piceno, can be traced back to the displacement of small communities coming from the areas of the coast. They went up the waterways including the Tronto river to escape looting and settled in the mountains, choosing a location that guaranteed security. The town acquired importance following the passage of the Salaria, a consular road built by the ancient Romans to connect the city of Rome with the Adriatic Sea, generating a commercial channel for traffic and salt transport. With the presence of the road arrived also dangers and it was then that the inhabitants protected their houses by encircling the small village with walls.

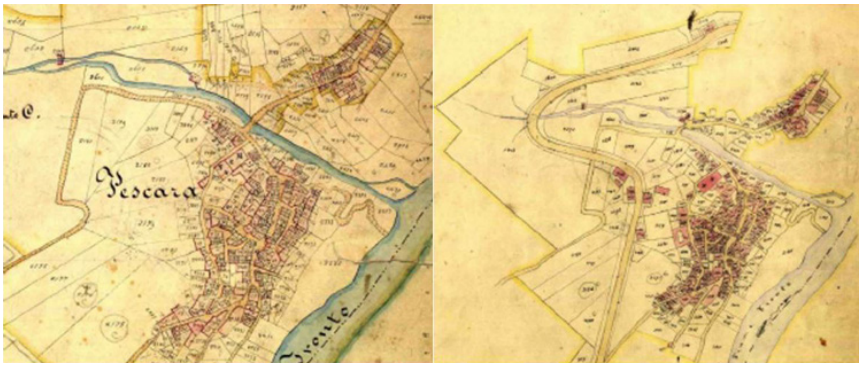

Fig.3.16 Catasto Pio Gregoriano, a.1820 c. and subsequent Catasto, a.1881

Pescara was the most affected town in the Arquata area by earthquakes. Its tuff and sandstone houses were literally crushed by reinforced concrete roofs and 49 of almost 200 inhabitants did not manage to survive the earthquake. Currently, passing near Pescara you cannot see anything, only rubble: a countryside demolished on the night of the first earthquake and then pulverised by the earthquakes of October 2016 and January 2017 (Fig.3.17).

In hypothesising a reconstruction scenario, we must take into account the specificity of this community which has needs different from all the others (Nimis, 2009; Gribaudi 2010; Petrucci, Romagni, 2018). Above all it is necessary to consider that it is the only village in the whole earthquake area of Central Italy that has suffered total destruction and cannot be reconstructed due to the geological causes that have determined its devastation.

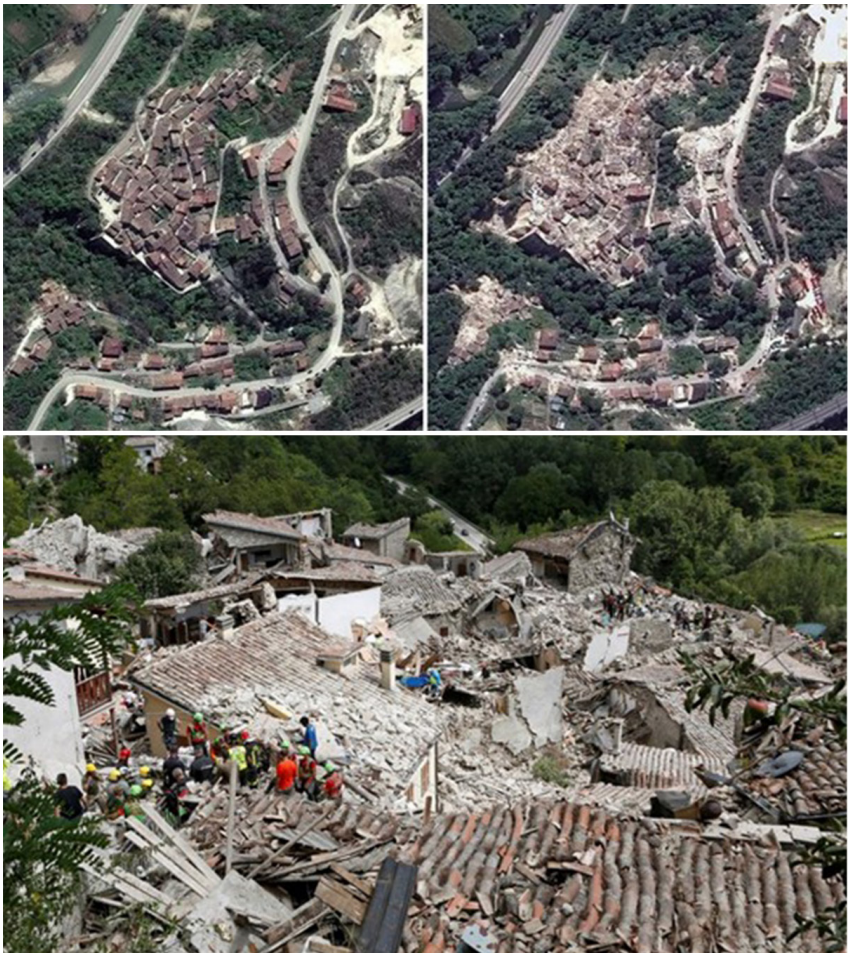

Fig.3.17 Views of Pescara del Tronto before and after the earthquake (source: https://www.archiportale.com/news/2018/02/concorsi/dare-un-futuro-alla-memoria-di-pescara-del-tronto_62460_30.html)

The identification of elements is almost impossible, except through the study of historical images (Fiorani 2019). Most crucially, the reconstruction in the same place is not possible due to site instability problems and inevitably Pescara will have to be relocated. If we cannot reconstruct in the same place, and we no longer have elements of identity that tell the story of the place, the question arises: has a bit of resilience still remained? (Castells, 2008). These issues are still open and no decisions have been made.

3.5 Conclusions

The complexity of the territory, already in strong crisis before the seismic events, was analysed, highlighting the need to take into consideration the local identity as a fundamental element on which to rely when a community is facing the consequences of a natural disaster. In order to identify the system of signs that a territory recognises as identity, a "repertoire of memory" of decorative and functional elements can represent a useful linguistic reference to undertake an effective reconstruction strategy that differs according to the conditions of the different villages, including restoration, philological reconstruction and delocalisation. For many of the destroyed or severely damaged places, it is necessary to identify qualitative criteria for reconstruction. In some cases, they are minimal interventions to improve accessibility and security of the context. In others it is possible to hypothesise reconstructions with the same volumes and on identical areas of the site by referring to the repertoire of identifying elements. In particular cases, a different or differently positioned volume may be proposed, preferring contemporary solutions that pave the way for new local development while contributing to safeguarding the identifying characteristics in the small historical centres with medieval foundations hit by the earthquake. Overall, we can talk about "Restoration" as a series of operations ranging from consolidation with improvement of buildings to the reconstruction of collapsed parts. In the strongly damaged or destroyed centres "Reconstruction" must be attentive to the return of the lost values. In the case represented by Pescara del Tronto, the need is for the "Preservation of memory" in a different and more evolved context that guarantees better living conditions for its citizens, where new capacities of resilience can appear.

References

Amoroso S., et Al., 2014. *Il piano di ricostruzione di Castelnuovo (AQ): Una esperienza di conoscenza, pianificazione e programmazione*, Firenze: Edifir.

Bartolomucci C., et Al., 2012. “Dopo la catastrofe: una casistica rappresentativa dello stato dei monumenti danneggiati dai terremoti aquilano ed emiliano”, *Materiali e Strutture, Problemi di conservazione*, 1-2, pp. 43-50.

Borghi E., 2017. *Piccole Italie. Le aree montane e la questione territoriale*, Roma: Donzelli.

Boschi E., Ferrari G., Gasperini P., Guidoboni E., Smriglio G. e Valensise G., 1995. *Catalogo dei forti terremoti in Italia dal 461 a.C. al 1980*, Bologna: ING-SGA.

Bucciarelli, A., 1982. *Dossier Arquatano*, Ascoli Piceno: Grafiche D’Auria.

Carfagna, B., 1996. *Rocche e castelli dell’ascolano*, Ascoli Piceno: Edizione La Sfinge Malaspina.

Castells, M., 2008. *Il potere delle identità*, Milano: Università Bocconi Editore.

De Felice, G., Pugliano, A., 1993. “Il lessico costruttivo dell’edilizia storica”, in A. Giuffre (ed), *Sicurezza e conservazione dei centri storici. Il caso di Ortigia*, Roma Bari, GLF Editori Laterza, pp. 69-99

Fiorani D., 2019. *Il futuro dei centri storici. Digitalizzazione e strategia conservativa*, Roma:Quasar.

Fabbrocino G., et Al., 2016. *Increasing the resilience of cultural heritage to earthquakes by knowledge enhancement: the lesson of the Carthusian monastery in Trisult*i. Atti dei Convegni Lincei, 306, “Resilienza delle città d’arte ai terremoti – XXXIII Giornata dell’Ambiente”, Roma, Bardi Edizioni, 553-556.

Galiè N., Vecchioni, G., 2006. *Arquata del Tronto. Il comune dei due parchi nazionali*, Folignano: Società Editrice Ricerche.

Gribaudi G., 2010. “Terremoti. Esperienza e memoria”, in *Parole Chiave*, 44, pp. 88-97.

Lalli, G., 2017. *La Torre Civica di Arquata del Tronto*, Arquata: Associazione Arquata Potest.

Mandolesi, E., Ferrero, A., 2001. *Piazze del Piceno*, Roma: Gangemi editore.

Nimis, G. P., 2009. *Terre mobili. Dal Belice al Friuli dall’Umbria all’Abruzzo*, Roma: Donzelli.

Petrucci, E., Romagni, L., 2018. *Alterazioni. Osservazioni sul conflitto tra antico e nuovo*, Macerata: Quodlibet.

Serafini, L., 2017. “Il restauro filologico alla prova della ricostruzione postbellica. Il caso abruzzese”, *Opus. Quaderno di storia architettura restauro disegno*, 1, 2017, pp. 43-62.

Varagnoli, C., 2013. “I piani di ricostruzione dopo il sisma del 2009 in Abruzzo e le istanze del restauro”, in A. Aveta, M. Di Stefano (a cura di), *Roberto Di Stefano: Filosofia e Prassi del Restauro*, Napoli: Arte Tipografica, pp. 257-262.

Zampilli M., Brunori G., 2018. “Scenari di Ricostruzione Post Sisma. Come definire modalità di intervento differenziate in rapporto ai danni”, in *RecuperoeConservazione*, 2018, 149, pp. 28-31.

Reconstruction between past and present

Comparing historic cities between Latvia and Italy

Francesco Giancola, University of L'Aquila, Italy francesco.giancola1@univaq.it
Department of Civil, Construction-Architectural and Environmental Engineering (DICEAA)

Abstract

In the decades following the Second World War, the city of Riga, capital of Latvia, which suffered large-scale destruction during the conflict, was subjected to urban reconstruction that led to the reappearance of entire sections of its traditional urban fabric. The issue of how to reconstruct the built fabric of towns and cities, whether individual buildings, urban blocks or entire districts, has been a major concern for all who have suffered war or natural disaster. In the city of L'Aquila as well as in all the small villages around the city this issue was raised very clearly after the 2009 earthquake. Several urban blocks were destroyed by the earthquake, such as the Onna village and the question was how to reconstruct the urban fabric traditionally, in a contemporary style, or perhaps using traditional urban fabric with some innovative contributions.

Keywords: Authenticity, Urban renovation, Urban fabric, Reconstruction, Riga, Latvia, L'Aquila, Italy

4.1 Introduction

The need to reconstruct after a war or a natural disaster is clear, but that requirement does not prescribe how it should be done. Referring to the past could be very useful to understand the mechanisms and dynamics that have made experiences like that of the city of Riga possible, and in particular of its centre, a world heritage site since 1997. Debates have tended to polarise around two alternatives: rebuilding in a contemporary style, signifying a new beginning, eradicating the errors and accretions of the past; or reinstating in a historicist style, replicating original appearances and materials of the buildings which have been lost, for reasons of continuity and identity. Between these two extremes, a third way provides a compromise solution.

The research methodology is focusing on two theorical aspects: an approach that connects architectural design with its context and another that finds a new method for a critical reconstruction with contemporary elements. The theorical approach to linking design with context divides into four categories: community architecture, contextualist architecture, iconic architecture and contextual eclecticism.

Community architecture is a movement that argues for the importance of user involvement in the design, construction and management of the environment. Many authors see the movement as a reaction to the disastrous failures of modern architecture and planning schemes. It considers participation as a better process regarding the users and their environmental needs. Contextualist architecture is a principle of design in which the structure is designed in response to its specific urban and natural environment. In an architectural sense, context can be defined as giving meaning to the various parts of a building through reference to its wider surroundings. For Iconic Architecture the connection between "architecture and the city" is one of the key elements in its relation to the environment. Its purpose is to attract touristic attention to the city, to create a brand and reach a new level of significance. Iconic architecture doesn't need to be integrated into the environment, it needs to be exclusive, exceptional, contrasting. Contextualist eclecticism is the opposite of "new reality" architecture. It uses historically established relationships to connect with the environment and it tends to use features of historical styles to be more attractive.

4.1 Critical Contemporary Reconstruction

Critical contemporary reconstruction should be a method of critical reconstruction with contemporary architectural elements, an approach that restores traditional scale, massing and detailing within a modern setting. It is divided into two main categories:

- Individual building blocks or entire districts;

- Inside the building.

In order to elaborate these aspects, I analysed two cases: the completely rebuilt Town Hall Square in Riga whose historic buildings were destroyed during World War II, and the Santa Maria Paganica Square and St. Peter Square - Onna in L'Aquila where almost all historic buildings were damaged by the 2009 earthquake.

4.2 Riga – Latvia, The case of the Town Hall City Square

The destruction during World War II significantly changed the uniformity of the urban development of the Old Town, creating openings in previously built-up areas (Figs. 4.1 and 4.2). In the post-war era, the historical spatial environment of the Old Town was

not consistently renewed as a whole. Within the framework of the ruling Soviet ideology, work was performed to eliminate local damage differently in separate areas. Soviet ideology pressure manifested itself most acutely in the obliteration of the remnants of the Town Hall Square. This caused discontent not only within the ranks of architectural and preservation specialists, but also of the public at large and became the basis of endeavours to renew the quality of the historical environment as soon as feasible after independence. After World War II, a number of 'gaps' were created in the redevelopment by not restoring the historical development structure in the destroyed city areas. To date their remains are only partially improved and used as civic open space.

This is how Līvu Square and the former Latvian Red Riflemen Square were formed, as well as the square at Kalēju Street at the crossing of Rīdzenes and Vecpilsētas streets, together with 'open spaces' in the area surrounding St. Peter's Church. The first post-war reconstruction carried out by the Soviet regime were the areas around the Town City Hall and St. Peter church. The system foresaw the complete redesign of the area without in any way referring to pre-existing spatial aspects. The result was the creation of two new building systems out of scale compared to the existing context. The first system was located in the north-west area of the square and the second was composed by two buildings that defined a new space connected to the church.

Fig.4.1 Urban fabric around the Town Hall Square before 1942 (source*:* Francesco Giancola, 2019)

Fig.4.2 In orange the bombarded area after 1942 (source: Francesco Giancola, 2019)

Fig.4.3 Post second world war ruins around St. Peter Church and the Town Hall Square of Riga. (source: Latvijas Valsts vēstures arhīvs)

Fig.4.4 View from Polytechnic Institute to the Town Hall Square and St. Peter's Church. Arch. Osvalds Tīlmanis, 1950. (source: Retrieved October 21,2020 from: http://forum.myriga.info/index.php?act=attach&type=post&id=37937)

Fig.4.5 Riga Old Town city centre. Comparison of the pre-war and post-war situation (source: Ugis Bratuskins*)*

The Soviet footprint caused a completely different spatiality for the entire area of the former town hall square. The urban fabric resulted in a huge out of scale system compared with the original buildings. After the Soviet regime a network of political, urbanistic and architectural systems was put in its place with the aim to bring the city back to the original urban system of the old town. The renewal and reconstruction practice of specific building elements in the Riga Town Hall Square reflected two of the most important renewal and development problems of the historical open environment and urban planning structure: a critical renewal of the lost historical building skyline on the one hand, and a reconstruction in terms of retrospective renovation of the lost building mass on the other hand.

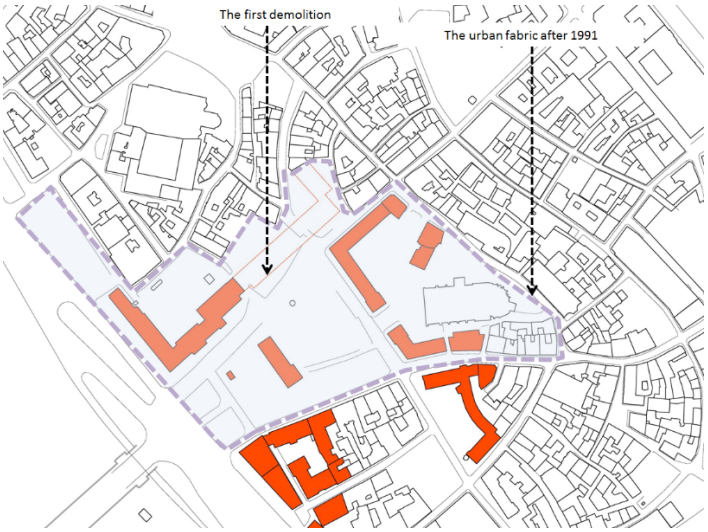

Fig.4.6 Situation after 1991 (source: Francesco Giancola, 2019)

Fig.4.7 Situation after 2004 (source: Francesco Giancola, 2019)

Fig.4.8 History of the town square – situation 2014 (source: Ugis Bratuskins)

The first operation carried out was the demolition of the RTU laboratories with the aim to recreate the space where the Town Hall used to be located. The first reconstruction of the area was the House of the Blackheads erected from 1995 to 1999 by Valērijs Kargins, the president of Parex Bank. The original building was built for a guild of unmarried German merchants in 1344. After that in1992 an amazingly true copy of the original the Town Hall was built.
Since 1995, the year of the first reconstruction around the Town Hall square in the city several architectural interventions took place, aimed to restore an image that was as coherent as possible with what was there in the era before World War II. These operations were carried out with different tools, ranging from the replica of the original system to buildings that were confronted with new methodological dictates of contemporary architecture. The result is a complete revitalisation of the public space and the memory that had been lost due to World War II first and the Soviet regime after that.

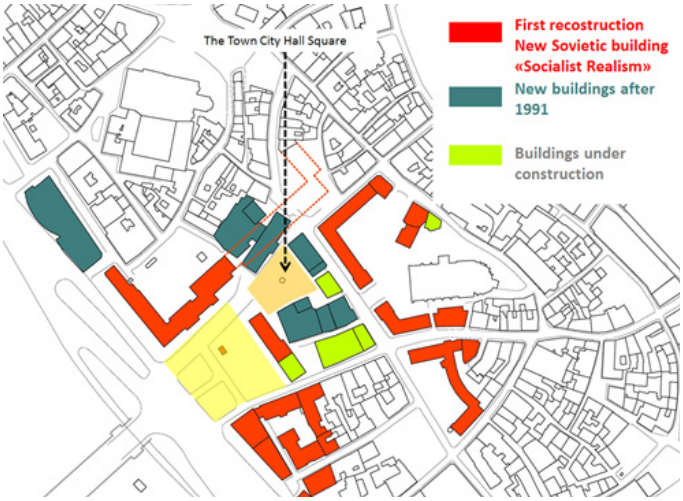

Fig.4.9 Today's situation (source: Francesco Giancola, 2019)

Fig.4.10 Theorical approaches from 1995 – 2019 (source: Francesco Giancola, 2019)

4.4 **L'Aquila, Italy**

4.4.1 The case of St. Maria Paganica Square

Among the complex interpretations of the relationship between the new and the existing in established historical centres, the Piazza Santa Maria Paganica is one of the most significant case studies in the city of L'Aquila after the 2009 earthquake. Located near one of the main historic streets, Corso Vittorio Emanuele, the space is surrounded by several buildings, ranging from the Baroque Palazzo Ardinghelli and the sixteenth-century Palazzo Cappa-Cappelli on the northern side, to the nineteenth-century buildings on the west and east sides. The four buildings were restored after the 2009 earthquake. The only example of "total reconstruction" which can be found in the square is St. Maria Paganica n.5 building. The square is closed on the south side by the 13th century church of Santa Maria Paganica which is still in a state of disrepair due to the damage caused by the 2009 earthquake (Figs 4.11, 4.12, 4.13, 4.14).

In this case study the theoretical approaches to cultural heritage may change, depending on the point of view of conservation, restoration or reconstruction. The fundamental elements that characterise the three approaches are the total preservation of the historic city, the recognition of the dominant value of the historical environment in general and finally the recognition of the dominant value of contemporary architecture in a historical environment.

Fig.4.11 Aerial view of the area surrounding Santa Maria Paganica Square in L'Aquila. (source: Francesco Giancola 2017)

Fig.4.12 St. Maria Paganica Church after 2009 earthquake (source: Civil Protection flight after the earthquake, 2009)

Fig.4.13 Ardinghelli and Kappa Cappelli palaces (source: Francesco Giancola, 2019)

Fig.4.14 The palace on the west side of the square (source: Francesco Giancola, 2019)

The ways in which the buildings in Piazza Santa Maria Paganica are treated are almost all in conservative mode. Restoration and conservative restoration prevailed for those buildings whose architectural features and values were evident. The only case where a contemporary intervention was carried out was for the building of the Civic 5 by the architects 2 Studio.

Within the generative logic of historical buildings this building is a "contemporary extension" of Palazzo Ardinghelli, future branch of the MAXXI in Rome, adopting the same architectonic lines as generative matrices of the facades and respecting the elegant proportion of empty and full, in particular the composition of the openings. The emptying of the square next to the volume at the corner of the south elevation summit formally recalls the string courses of Ardinghelli palace, contrasting with the austere mouldings of the eighteenth century geometric pattern of the facade boards.

The scrupulous care in terms of intervention scale and compositional dependence of the various components does not neglect their chromatic and material aspects. They are important perceptions from the public space around which the fibre cement panels wrap that make up the ventilated façade, not very different from the tactile sensations of the neighbouring plaster palaces, reinterpreting colours and dissolving the opening frames by respecting the shades of context.

Fig.4.15 The St. Maria Paganica building n. 5 by 2 Studio and its relationship with Andinghelli Palace (source: Francesco Giancola, 2019)

Fig.4.16 The St. Maria Paganica building n. 5 on the southern side of the square (source: Francesco Giancola, 2019)

4.4.2 The case of the first reconstruction of an Urban Block: The Ciancone1 Urban Block in St. Peter Square (Onna)

During the 2009 L'Aquila earthquake several historical centres such as Onna were severely struck, with heavy damages extended to the whole built-up areas and collapses of large portions of many urban blocks. Because of the comprehensive damages suffered by these centres, the problem of the possible restoration of their surviving or little damaged areas and reconstruction of the completely collapsed or irreparably damaged wider zones involves the need to handle much more complex situations than those faced by other cases. It presupposes the possibility of formulating new urban paradigms linking historical urban fabrics with new contemporary styles.

Due to the extent of the damage and following the proposal of the German Embassy, the Municipality of L'Aquila implemented the Onna reconstruction plan by the Schaller / Theodor Architekten and Stadtplaner AKNW studio, the first in chronological order for the entire L'Aquila area. The basis of the master plan was the express will of the Onna residents to rebuild their place in a way that recovers what made it so unique in the memory of its residents, summarised in the sentence "how beautiful it was".

The rebuilding was divided into sub-areas corresponding to the structural ones. As can be seen from the plan (Fig.4.17), eight sub-areas (buildings) have been identified. On the architectural level, the whole building complex follows the original pre-earthquake shape of the public spaces in front of it, paying particular attention to the facades by trying to keep the original salient features of the buildings unchanged. In particular, the voids alignments, their shape and proportion have remained unchanged as much as possible.

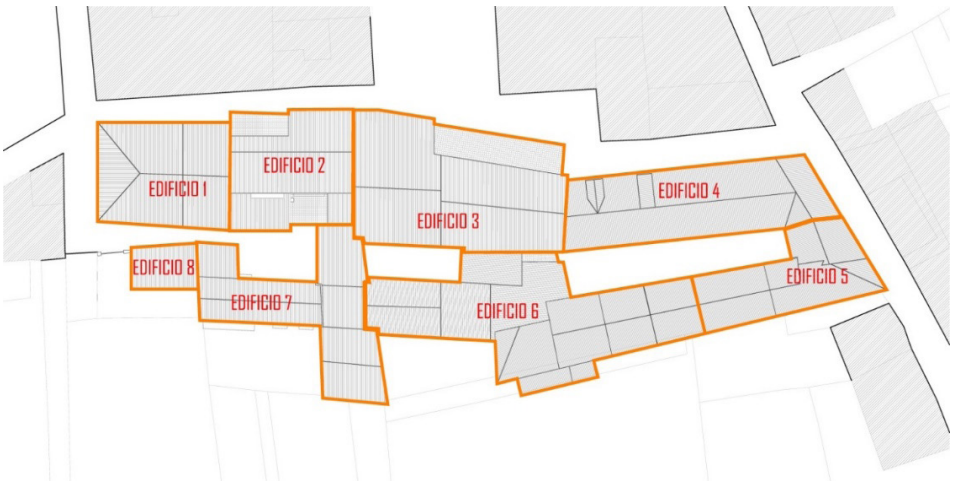

Fig.4.17 The general plan of the new urban block (source: Francesco Giancola, 2016)

Fig.4.18 The Ciancone1 new urban block in Onna (L'Aquila) (source: Francesco Giancola, 2018)

Fig.4.19 The Ciancone1 new urban block in Onna (L'Aquila) (source: Francesco Giancola, 2019)

4.5 Conclusions

Considering that "conservation" is not a realistic option after a war or a natural disaster the best way to conserve the cultural heritage and to preserve its memory may be to reconstruct the built fabric, towns or cities - whether individual buildings, urban blocks or entire districts. It is not only about preserving past values which are most certainly of fundamental importance as such, but of handing down values and as well as contemporary buildings to future generations that leave traces of memory, as had happened after the disastrous earthquake of 1703. The approach of restoring traditional scale, massing and detailing within a modern setting may be one good way to preserve the memory of the past and at the same time transmit the memory of the present to the future.

References

Clementi, 2009. *Storia dell'Aquila*, Editori Laterza, Roma

Dripe J., Latvijas arhitektūra pēc 1940. gada – sociālais un kultūrpolitiskais aspekts // Latvijas arhitektūra. – Rīga, 1989. – Pp. 21–24. (Architecture of Latvia After The Year of 1940 – Social And Culture Political Aspect; in Latvian)

Krastiņš J., 2003. Rīgas Rātsnams kultūrvēsturiskā, pilsētbūvnieciskā, metodoloģiskā un politiskā skatījumā // Latvijas Arhitektūra. –. – Nr. 6(50). – Pp. 10–15. (Riga Town Hall In Historical, Urban, Methodological And Political View; in Latvian)

Stockel, G., 1981. *La città dell'Aquila. Il centro storico tra il 1860 e il 1960*, Edizioni del Gallo Cedrone, L'Aquila

The St. Maria Paganiga building n. 5 http://www.2studio.eu/edificio-santa-maria-paganica-5/ (Accessed 30 August 2019).

Reconstruction after a programmed disaster

The construction of a dam: Zuri and Cantalupo Ligure, Italy

Chiara L. M. Occelli, Polytechnic of Turin, Italy chiara.occelli@polito.it

Riccardo Palma, Polytechnic of Turin, Italy riccardo.palma@polito.it

Irene Ruiz Bazán, Polytechnic of Turin, Italy iruba27@gmail.com

Abstract

In this chapter we present two case studies of the research "The 'Osso' of Italy" of submerged settlements: restoration, reconstruction and translation of memories. The main objective is an in-depth and comprehensive study of submerged settlements as consequence of the construction of water reservoirs. These operations which took place mostly between the 1930s and the 1950s, common in Italy and Spain, triggered three phenomena: the disappearance of villages and their rediscovery for tourism purposes; the construction of new population centres with the related problem of the production of memories; and the translation of memories of buildings dismounted before their submersion into new buildings, or parts of them. These two cases are related because the first one, the submersion of the village of Zuri in Sardinia in the early 1920s seems to have become a model of reconstruction for other cases in Italy, while the second one, the Cantalupo Ligure (Alessandria) case, was finally not carried out.

The "planned" disaster which represents the construction of a dam is a good opportunity to analyse the reconstruction plans which involved the population historically and which at present constitutes an opportunity to reflect on the needs of the population when their homes are about to disappear. It enables us also to reflect on the topic of "collective memory" in order to build new concepts through which to analyse and design very contemporary fields of study, themes and topics, such as those related to villages in areas with high seismic risk or hydro-geological instability.

Keywords: Reconstruction, Dam, Urban-planning, Zuri and Cantalupo Ligure, Italy

5.1 Disaster, abandonment and re-foundation: research about submerged villages

"The disaster ruins everything, all the way leaving everything intact" (Blanchot, 1986, p. 1). The disaster, says Blanchot, "means being separated from the star" (p. 2), so it means not to be under the asters. It means leaving every reference system, go out from every order, from every measure, from every possible reference colocation in space. The disaster disrupts living, not only because it destroys the things that men have to cure and defend; not only because it destroys the things that men have to construct, but because it denies men to measure themselves with divinity, denies them to live poetically, as says Heidegger . The disaster seems to mute people, but, we think, in the philosophy of Heidegger (2018) it is possible to find a way out: the central role of remembrance thinking (Andenken), tracing remembrance that is a characteristic role of architecture. Indeed, remembrance thinking could be of extreme importance when the disaster prevents us from looking at the sky or, even worse, when we are obliged to leave the places we know to go somewhere else from which we will see another sky, other asters that we do not know. Destruction upsets the memory but at the same time it turns on the desire for excavations, for discovery, for study that unsettles places, thereby increasing memory storage. After a disaster, in particular after the abandonment of a loved place, people rebuild their present not only in view of the future, but they re-find, re-write their past, they reinvent – in an etymological sense – their memory.

The disaster, then, becomes the germ for the re-foundation, for a current situation of intense debate on the reconstruction of entire settlements due to various natural disasters such as earthquakes, tsunamis or floods which unfortunately are expected to be more and more frequent due to the undeniable climate change. Perhaps a research path to carry out future reconstruction proposals is to look to the past.

Spain and Italy, due to their particular orography and climatology and a series of political circumstances which happened during the 20th century, became two leading nations in the construction of dams for the production of electricity and irrigation water. The construction of dams was justified by the process of industrialisation of cities and increasing demands of electrical energy and water for irrigation. However, we must not forget that these phenomena were mainly linked to the fascist regime of Mussolini and its development policies in Italy until the end of World War II and later and, unquestionably, to the Franco regime in Spain which saw in the construction of dams one of its greatest economic and infrastructural achievements. In these political contexts, the true impact of these actions was in many cases silenced and even masked by the news of the press that extolled the sacrifice of the inhabitants of these places for the common good and the progress of the country.

Many villages disappeared completely under water which led to the construction of new population centres with buildings and structures that replicated not only the external appearance of these lost villages and ancient buildings, but also in some cases their former topographic placements. In respect to the villages, empty or consolidated as ruins, the citizens that were forced to leave remained nevertheless linked to these places. Many of these populations came back periodically to maintain some traditions or rites. This occurred to the populations whose villages had been submerged. They

came back when the increasingly frequent periods of drought exposed their homes. All these phenomena tell us about a relationship between dwelling and the earth itself, the one they were once physically attached to, and with which these dwellers have still a connection, even if that earth no longer exists as they knew it as it was submerged and disappeared. This situation allows us to ask ourselves to what extent dwelling is related to the earth itself and how it is possible to maintain this link, especially when it is physically broken. This reflection can help to find the roots for the reconstruction project of destroyed areas as a result of war or natural disasters, such as earthquakes. In this respect we think that it is possible to take as an example another kind of disaster, in this case programmed, such as the construction of dams. Such a situation does not allow to return ever again to "that" earth; historically, however, as we have seen, people have tried to maintain a link, in order to relieve their trauma.

Looking afresh at this part of the history of Italy and Spain, still only little analysed from an architectural point of view, enables us to understand that the construction of a dam, due to its natural, but especially social, implications when it comes to the submersion of a population, can be compared to a disaster, albeit a "programmed" disaster. In relation to the reconstruction of the new settlements such "programming" sometimes led to a broader reflection on what was the best option to relocate families and, in some cases, even let the reconstruction be negotiated with the inhabitants.

According to the general conclusions of the studies by Fujikura and Nakayama (Fujikura and Nakayama, 2019) livelihood reconstruction for re-settlers resulted in failure due to lack of, or poor resettlement plans for many dam construction projects. They point out that the World Commission on Dams (WCD) conducted comprehensive comparative studies of 125 existing large dams and intensive studies of eight dams. It published a report in 2000 with recommendations for dam development. However, the recommendations were not adopted by the World Bank and were rejected by some Asian countries such as India and Nepal. The WCD, therefore, failed to establish widely accepted norms for dam development. The Asian Development Bank (ADB) announced its Safeguard Policy Statement in 2009. This includes safeguard requirements for involuntary resettlement, including criteria for compensation and land acquisition which are based on purely economic aspects. They also state that it will be difficult 'to mitigate the attachment of re-settlers to the submerged land', without however offering any solution to solve this situation that is repeated in all cases of resettlement due to a dam construction.

These general studies and conclusions provide a very valid intellectual framework to act on economic development strategies. However, as De Wet (De Wet, 2005) points out, in the cases "where social, spatial, economic and political relations are intimately intertwined, where resources have multiple uses and meanings and where livelihoods are multi-stranded, complexity is not simply an aesthetic or intellectual value- it is the key to socio-economic viability and sustainability- and to overlook that complexity is to undermine the basis of both livelihood and community". This idea is shared by Cernea (Cernea, 2009) who argues that the magnitude of the combined material and non-material impoverishment risks and losses experienced by the re-settlers exceeds the redeeming powers of narrow compensation-centred solutions offered by conventional economics. He identifies a structural incongruity in policies which define their goals as improving or restoring the livelihoods of re-settlers and rely only on compensation as

virtually the sole means for achieving either of these goals. De Wet also states that for reasons of efficiency and cost-effectiveness, planners are predisposed to simplify this complexity to manageable dimensions, which often leads to skimming over the top of insider complexities and ambiguities, and at worst, getting them fundamentally wrong.

Therefore, the study of these historical cases permits us to go through these processes with hindsight perspective in trying to analyse what happened and to draw some conclusions that could enable us to design future strategies for the reconstruction of other settlements after un-programmed disasters. In particular, in the study of the two Italian cases presented below, we are analysing the repetition of the same model of reconstruction and the contradictions that this repetition implies.

5.2 First case study: Zuri, Sardinia, Italy

The modestly inhabited area of Zuri in Sardinia, Italy with about 200 inhabitants in 1923, became one of the first known cases of an entire submersion of a village for the construction of a dam in Europe. Furthermore, due to the presence of a magnificent church, San Pietro di Zuri, a Romanic-Lombard construction of the thirteenth century, Zuri offers the occasion to study one of the first monuments dismantled and moved to another place caused by the construction of a dam. Fortunately, a lot of documentation about the process is preserved. On the one hand, the hydroelectric company itself financed a book on the transfer of the church, published in 1926 and written by Carlo Aru, the architect in charge of the process. On the other hand, the work of Lucia Putzu, "Angelo Omodeo e l'isola delle acque. Un archivio racconta" (Angelo Omodeo and the island of waters; an archive tells) (Putzu, 2008), has widely analysed the archive of Angelo Omodeo, engineer in charge of construction of the dam. In addition to this, several local researchers published different studies that enable us to trace the whole submersion and reconstruction process of the settlement.

Zuri was located in the province of Oristano. The construction works of the dam of Santa Chiara, by the barrage of the river Tirso were carried out from 1917 to 1924. The engineer who directed the works was Angelo Omodeo, whose name was given to the artificial lake created as a result of the construction of the dam. The hydroelectric company responsible for the construction was Società Imprese Idrauliche ed Elettriche del Tirso (SIIE) (Tirso Hydraulic and Electric Companies, SIIE).

Zuri, being in proximity of the river Tirso at an altitude between 85 and 105 meters above sea level, was destined to be submerged by the new basin, because the water level, with the reservoir at full capacity, would have reached the altitude of 109 meters above sea level. In order not to invade the inhabited area of Zuri nor to submerge its church of San Pietro, it would have been necessary to reduce the height of the dam by 21 meters. This would have reduced the capacity of the basin and the consequent benefits by more than half. (Deriu and Chessa, 2015).

It is clear that, considering all the expectations related to the realisation of the work, at that time the biggest in Europe, the appeals to the Government made by the inhabitants of Zuri to save their village, were not taken into consideration. Regarding to the transposition of the church, as Carlo Aru explains (Aru, 1926), the first problem to solve was, obviously, to decide where to reconstruct the new village. When he started to plan the

transposition of the church, SIIE had already chosen to move the settlement not far from the original village on the same slope in the locality of Seddargious that presented the best conditions for the purpose. In the concession regulations (art. 11, chapter II) (Deriu and Chessa, 2015), it was established that the village of Zuri should be reconstructed in a suitable location located on a higher altitude than the lake at the expense of the concessionaire, the hydroelectric company, after consultation with the local governmental authorities according to the laws in force. Aru explains that the construction company explored two possible solutions with the inhabitants: aggregating them into a neighbouring municipality – this solution was discarded from the beginning - or choosing a new locality that would host the new village, "Zuri Nuova". The second solution provided two possible locations. One was the Fenughera locality, included in the territory of Zuri, nearer to the existing village, on the same slope as Aru pointed out; the other one was the locality called Murreddu, which is part of both the municipality of Soddì and that of Boroneddu.

On July 1920 a municipal council was choosing the locality for the reconstruction. It was possible to express the preference for the two sites designated for the possible location of the village in a vote. With a majority of 40 votes against 11 the voters expressed their own preference for the site of Murreddu, over that of Fenughera. In 1920, SIIE had therefore purchased land in the locality of Murreddu, located between the municipalities of Boroneddu and Soddì, to build the houses of Zuri Nuova. In addition to the reconstruction of healthier and more hygienic houses than the existing ones, the SIIE Company would have provided, at its own expense and with its own means, the transport of all the furniture, household goods and agricultural implements from ancient Zuri to the new houses.

The reconstruction project of the village by SIIE provided the arrangement of two water sources, already existing in the locality of Murreddu, to be used for public washhouses, as well as the repair of a source for potable use, with a rainwater collection tank. These springs would become the property of the municipality of Zuri. Additional commitments of the SIIE were: the arrangement of the internal roads and the access to the neighbouring municipality of Soddì; the arrangement of a carriage road from the locality of Murreddu that would take to the provincial road Ghilarza-Neoneli and from there to the built-up area of Borneddu; the construction of the road that would lead from the remaining town of Zuri Antica to Zuri Nuova; the construction of the Municipal Town Hall and the Monte Granatico, the transport of the church of San Pietro and, finally, the construction of a cemetery, with the annexed chapel dedicated to Santa Barbara, in places still to be identified.

Regarding the reconstruction of the church, Aru wrote that the main objective was not to alter the environment surrounding the monument or the "point of view" from which it could be observed (Aru, 1926). It was also important for him to keep the church close to the population of Zuri "whose inhabitants had seen their ancient village and its territory submerged on behalf of a superior and essential requirement of civility" (Aru, 1926, p. 67). According to Aru, it was about conserving an almost unchanged image of the *'natio loco* (original location) (Aru, 1926, p. 68). He stressed the difficulty of solving the problem of relocation since "every inhabitant had to assert his project. It seemed that every family wanted the church on their doorstep" (ibid).

The project of the new village foresaw a radial plan organised around a rhomboidal square of 1500 square meters. Eight radial streets that originate from the square crossed the village. The square seemed to be the most obvious place where the ancient church could be relocated. Although this solution represented a conciliatory way among the different opinions, Aru was opposed outright. According to his opinion, the monument would have been completely sacrificed among the narrow circle of the ordinary houses, both from a generically picturesque and from a specifically perspective point of view. Therefore, at last Aru decided to locate the church along the border of the village and to orient the façade perpendicularly to the axis of one of the streets. He chose this street because it presented a slight slope rising from the square towards the outside of the village. With this new solution, the façade remained visible from the square and from many points of the vast plateau of Campeda. It was possible to have different points of view of the church especially approaching from the road to Soddi. In the ancient village the church had the same relationship with the main street and the altimetry. Therefore, the new plan repeated a specific visual relation between monument and settlement despite the different general setting.

The criterion of looking for the best views for the reconstruction of the monument was very much in line with the ideas of the monumental restoration of the time that was reflected later in the Charter of Athens. "The Conference recommends that, in the construction of buildings, the character and external aspect of the cities in which they are to be erected should be respected, especially in the neighbourhood of ancient monuments, where the surroundings should be given special consideration. Even certain groupings and certain particularly picturesque perspective treatment should be preserved" (Athens Charter, 1931). Furthermore, during the reconstruction by anastylosis, Carlo Aru practiced a stylistic restoration of the church, according to the tendencies of the time and he eliminated non-original parts in order to purify the Romanesque aspect of the church.

According to Pilar García Cuetos (García Cuetos, 2014) the same kind of restorative interventions occurred during the transposition of the church of San Pedro de la Nave in Zamora, Spain, for the construction of a dam between1926 and 1928. This was another example of stylistic restoration undertaken at the occasion of the transfer. In analogy with the case of Zuri, we can find different news in the press of that time on the reconstruction of San Pedro de la Nave about the controversy that characterised the decision on its location and the desire of the inhabitants to have the church close to their homes.

As a consequence of the desire of the Zuri population the plan of the new village presented a very particular distribution. It had a square plan, whose main axis was one of the diagonals that presented an almost perfect north-south orientation. The rest of the village was divided by the other east-west diagonal and by two other perpendicular streets that crossed the entire settlement. As a result, houses - with patio inside – were organised in triangular blocks with their façades along one of the eight streets that configured the village and that originated from the central square. The new houses, one-story buildings with stone facades and gabled ceramic tile roofs, had a similar aspect to the pre-existing ones, as we can see in the photographs contained in Aru's book.

5.3 Second case study: Cantalupo Ligure, Albera Ligure and Roccheta Ligure, Piedmont, Italy

The case of Zuri - widely studied as we pointed out - enabled us to establish a possible parallel between the reconstruction of the Sardinian village and the preliminary projects that we had found for the reconstruction of a village due to the submersion

of three villages in Piedmont. That led us to think that the case of Zuri was employed as a model for the reconstructions that were carried out thereafter in those cases. The projects we had analysed are conserved in the Enel Archive in Naples (Occelli, Ruiz, 2019). Although this dam was not built, and therefore the villages were not submerged, the documentation collected in the archive enabled us to go through the entire process planned for the attempted realisation of this project. This fact is extremely important because during our research we verified how these stories, generally controversial because of their social relapse had been mostly silenced, and it is very difficult or almost impossible to find information about such projects. Perhaps because this was not built, we can affirm that it is one of the best-documented processes of those studied so far. The project is conserved under the signature F 751-752 250 BORBERA. Edison Society of Milan, construction management of hydroelectric facilities.

In the folder referring to this project the following different types of documents were included. The document of "Expropriations and reconstructions, General considerations" written by the engineer Alberto Bordini (budget specialist and professor of Estimo at the Polytechnic of Turin), and signed in Chiavenna (Sondrio, Lombardy) on 20 December 1931 for the hydroelectric company Società Elettrica Interregionale Cisalpina (Cisalpina Interregional Electricity Company). In the eleven pages of the document Bordini explained the 'animus' that was to follow the expropriation process and the difficulties that it entailed. This document has a marked economic nature, maybe because it aimed to optimise the reconstruction solutions of the new villages caused by the preliminary calculations for the construction of the dam. Indeed, these calculations demonstrated that this dam would not have yielded sufficient income from the sale of electricity to deal with the flooding and subsequent reconstruction of the three affected villages: Rocchetta Ligure (898 inhabitants), Albera Ligure (846 inhabitants) and Cantalupo Ligure (1315 inhabitants), as well as their different fractions: Pertuso, Colonne, Arborelle, Besante, Carraro, Strappesese, S. Nazzaro, Pagliaro inferiore, Astrata, S. Martino and Spinola.

In the same document, some considerations are very interesting for reflecting upon the reconstruction. One of them was the difficulty of assigning the new houses to the inhabitants of these places. Different solutions were proposed. One of these was a draw, but it was objected that the houses could be subsequently submitted to possible exchanges and payments among those affected who would like to change the assigned houses. Therefore, another solution was proposed: an auction starting with the best houses. The houses for which no one made offers would then be assigned to people who had made no offers. The same document indicated that the benefits derived from the sale of the best houses would have been destined to "some pious works in the place", such as a small hospital, a school or others.

Also indicated was the convenience of establishing three housing typologies to be manufactured in series to reduce costs. A survey of all the houses of the ancient villages was carried out to define three categories based on the number of rooms and other functional features. Each of these new typologies was to respond to the characteristics of the best existing house in each of the established categories. The same document also indicated the possibility that the interested parties could build their own house on land assigned to them in the land use plan, under condition that the old house would be demolished, by the authorities, even before the completion of the construction work of the dam.

The study we were analysing already reflected the problem that probably led to the failure of the operation. It was most certainly the insufficient hydroelectric revenue com-

pared to the enormous construction costs of the reservoir and the costs of expropriation and reconstruction which were increased by the revaluation of the lira that occurred in those years.

The file conserved at the archive of Naples contains all the minutes of the meetings between the consortiums of owners, the entities interested in the construction of the dam, the Province of Alessandria, the mayors of the affected municipalities and the hydroelectric company. In addition to these documents, we found several budgets and calculations of expropriation and reconstruction costs, modified successively during progress of the negotiations carried out at the meetings with the different owners. For each detailed plot different amounts were collected corresponding to the compensation calculated for all the inhabitants of the affected villages, together with detailed plans and photographs of some of the buildings that were to be expropriated. We also had access to the designs made for the reconstruction of the different settlements, with plans at 1:100 scale of the three types of houses, hotel model, school and cemetery as well as the general plan for each of them, albeit without date or signature.

Moreover, these folders also contained the correspondence between the company and the different interested entities. Some letters directly referred to the control that should be established on the people who would be part of the consortiums of owners in order to avoid the participation of characters considered "dangerous" for the interests of the company. In addition, several local press clippings were preserved in which, among others, reference was made to the collapse of the Gleno dam, which in 1923 caused more than 300 deaths in the provinces of Bergamo and Brescia with the consequent concern of the inhabitants of the valley of the Borbera. All this documentation enabled us to follow the complex process of construction of the dam and reconstruction of the affected villages from the initial calculations to the last negotiations which, in this specific case, did not materialise. These documents of great historical value enabled us to understand the magnitude of these actions and the different positions of the affected entities.

In addition, from the preserved plans we could study the different typologies of rural houses and service buildings as well as their planning. This kind of documents constitutes a first order source to understand the conception of housing development and habitability conditions during that period, as well as the social needs of the different communities. Last but not least, the survey of the buildings to be expropriated provided important data on the state of conservation and the characteristics of the properties of these villages, permitting to obtain a true "photograph" of the living conditions in mountain villages during these years.

As we had anticipated, the master plan for the reconstruction of Cantalupo Ligure, designed at a 1:500 scale, was particularly reminiscent of the one of Zuri and had no relation to the previous layout of the inhabited nucleus of its own area, drawn at a 1:1000 scale. The new master plan was coloured with three different colours (red, green and blue) to represent buildings, roads and void spaces respectively.

As in Zuri, the main layout consisted of a plant crossed by eight main streets, whose north-south axis led to the new church, placed at the north end with a small rectangular square in its front, and the crossing of the main streets which formed a central square. The eight main streets were crossed by other concentric streets to the central space, an option that seemed logical because the new town of Cantalupo Ligure had to shelter about 1,300 people, six times more than Zuri.

A priori, and taking into account the model of the central-plan city, such as, for instance, its well-known prototype Sforzinda designed by Antonio Averlino "Il Filarete",

the buildings of greatest importance, such as the church, had to be placed in the centre. This could be considered as an almost "natural" tendency for locating the most important buildings, as we can see also in the reconstruction of the town of Puertomarín in Spain after the flooding due to the realisation of a dam (Pons Sorolla, 1961). Therefore, although the transfer of the church of Cantalupo Ligure was not foreseen and the reconstruction of a completely new one was planned, the master plan followed the same principle as that of Zuri, leading us to think that there was a relationship between both reconstruction proposals that foresaw the same urban configuration around the church with a radial urbanism.

The main difference was that in the case of Zuri, this placement made sense around the significance of the transferred monument, while in Cantalupo Ligure the church was projected to be new. Nevertheless, despite being able to free the urban configuration from the strong anchorage to the monument, it was chosen to maintain the same solution that had been found elsewhere and that could function spatially to respond to the need of the displaced population of a new village.

5.4 The necessary selection of the memories

The two examined cases show how memories of the ancient settlements were reproposed in the new ones by means of a selection of specific features, strongly linked to specific problems of the project programme. Projects of reconstruction denied pure repetition and equally pure difference. In the case of Zuri the new urban layout is very different from the ancient one, but the relationships between the church and the settlements are the same. Also in the case of Cantalupo, the layout obeys the same abstract model, but the new houses repeat some functional features of the ancient ones.

It is not the point of this chapter to judge whether these solutions are more or less effectual, considering that they depend on different historical, social, but also human circumstances that only deeper historical research could enlighten. Our aim was to study historical cases in order to explore design strategies able to respond to current emergencies. Therefore, for us the reconstruction projects of Zuri and Cantalupo were interesting because they taught us that in architecture – but maybe also in our life - memory is a social construct based on partiality and occasionality. Architectural memory of reconstructed settlements is something that arises – like the involuntary memory of the "Recherche des Temps Perdus" by Marcel Proust – due to the urgency of a problem that a project cannot deny.

When asking ourselves, how to rebuild the visual and monumental relation between the church and the settlements, or how to reproduce the functional features of the houses, reconstruction of their memory is a tactical process. We are aware that we can only practice this if we are able to play a double game: satisfying the project programme and, at the same time, – like Aru – choose among the endless problematic multiplicity of the project the problem whose solution can architectonically play the game of memory.

References

Aru, C., 1926 *San Pietro di Zuri*. Reggio Emilia: Società Imprese Idrauliche ed Elettriche del Tirso.

Blanchot, M., 1986 *The writing of the disaster*, trad. Ann Smock, Lincoln and London: University of Nebraska Press

Cernea, M., 2009 'For a new economics of resettlement: a sociological critique of the compensation principle', *International Social Science Journal*, no. 175, (p. 17).

De Wet, C., 2005. *Development-Induced Displacements: Problems, Policies and People*, New York, USA, Berghahn Books.

Deriu, G., Chessa, S., 2015 Zuri Antica: una villa sepolta nel Lago Omodeo, *Almanacco gallurese* (2014-2015) pp. 222-31.

Fujikura, R., Nakayama M., 2019 Overview: Livelihood Re-Establishment After Resettlement due to Dam Construction in: Journal of Asian Development, vol. 5, no. 1, 2019, (pp. 1-11).

García Cuetos,M. P., 2014. Desmontes, traslados y reconstrucciones de monumentos. Soluciones "excepcionales" y su aplicación metodológica en la restauración del siglo XX en España. In: J. Delgado Rodrigues, *De Viollet-le-Duc à carta de Veneza,* (pp. 551-557) Lisbon: Artis.

Heidegger, M. (translated by McNeill, W. and Ireland, J,) 2018. Hölderlin's Hymn "Remembrance". Indiana University Press

Occelli, C., Ruiz Bazán, I., 2019. El archivo histórico de Enel Italia (Nápoles) como fuenepara el studio de la arquitectura y la restauración de los pueblos sumergidos por la construcción de pantanos. In: *V Congresso Internacional sobre património industrial – Cidades e Património Industrial* (In press)

Pons-Sorolla y Arnau, F., 1961. Traslados de monumentos en España. Puertomarín. *Arquitectura nº 36.* Pp. 17-25.

Pulisci, C., 2014 Vero o Falso? L'Anastilosi. Un caso nella Sardegna degli anni Venti. In: C. Costa, V. Valente, M., Vinco, *Arte tra vero e falso. Atti delle Giornate di studio.* Padova: Coop. Libraria Editrice Università di Padova.

Putzu, L., 2018 *Angelo Omodeo e l'isola delle acque. Un archivio racconta.* Cagliari: Grafica del Parteolla.

Torres patent for reconstruction

Application for Messina after the earthquake of 1908

Marco Marino, Iuav University of Venice, Italy mmarino@iuav.it

Abstract

The case of the "Aseismic Patent for Homes" by Giuseppe Torres is a construction system for monolithic buildings with a circular, modular plan, used for the complete and original reconstruction of the City of Messina after the earthquake of 1908. This project is a unique testimony of an urban restoration attitude, which attempts to bring together technological innovation with the formal tradition, giving rise to new and original forms of the city. The study of the Torres archives, stored at the Iuav Projects Archive, was essential for the research. The preserved drawings are the only evidence of an almost unknown project, which is an essential documentation for the reorganisation of the design process that led to the Technical Patent in 1909, and the subsequent original urban composition. The attitude of Torres is an example of reconstruction in which originality is represented by technological innovation and the consequent resulting form. The reconstruction, in the case of Messina, is an opportunity to innovate both technical and formal instances that are then translated into a "new rosy city" with original shapes.

Keywords: Aseismic, Messina, Patent, Torres, Italy

6.1 Introduction

Reconstruction questions the capacity of an entire community to face the future. In the aftermath of war or devastation, which reduces homes and workplaces to rubble, starts a decisive moment of discussion, the results of which are often transformed into genuine original works. The novelty of the reconstruction process is linked to the principle of discrimination between what can be preserved and what, inevitably, due to the errors made in the past, can be modified or eliminated. In the specific case of the reconstruction of entire cities, the correction of past mistakes entails a profound reflection on the ways in which man lives in his environment, and by extension on the entire planet.

6.2 Innovative reconstruction

Reconstruction questions the capacity of an entire community to face the future. In the aftermath of war or devastation, which reduces homes and workplaces to rubble, starts a decisive moment of discussion, the results of which are often transformed into genuine original works. The novelty of the reconstruction process is linked to the principle of discrimination between what can be preserved and what, inevitably, due to the errors made in the past, can be modified or deleted. In the specific case of the reconstruction of entire cities, the correction of past mistakes entails a profound reflection on the ways in which man lives in his environment, and by extension in the entire planet.

With the First World War, and definitely more with the Second World War, an extraordinary season of innovation starts, thanks also to the physical condition of the tabula rasa that often occurs in large portions of urban territory. Destruction and what it entails is "an ideal condition [...] to propose a project without excessive conditioning by existing structures" (Mamoli and Trebbi, 1988). The first post-war period offers elements of unexpected novelties, that are part of a new culture, which in those years spread throughout Europe. The greatest achievement of post-war reconstruction was the definitive liberation from the nineteenth-century concept of philological restoration, which imposes the "how it was where it was" way of re-building (Treccani, 2015).

The reconstruction of Messina following the 1908 earthquake was one of the first cases in which we approached the theme with a modern sensibility in the European context. The first decades of the twentieth century were years of patents and new studies of the building typology, which changed the imagination of contemporary architecture in a few years. The competitions launched following the disaster on the Sicilian strait, in which some of the protagonists of future modernist architecture also participated, were the first occasions to rethink the forms of human settlement.

The proposed innovations concerned the use of new materials which permitted to reduce costs and construction times; the modular construction which facilitated the overall design of the settlements; the increasingly rare use of the decorative apparatus; the abandonment of the concept of style; together with deep reflection on the relationship between man and architecture.

On the morning of 28 December1908 at 5.02, Messina and Reggio Calabria were razed to the ground by what was recorded as the most destructive earthquake in Italy. On that morning more than one hundred thousand people lost their lives and almost all the

buildings collapsed from the impact (Tacconi, 2016).

The devastation on the strait was certainly one of the heaviest tragedies of the early twentieth century in Italy, but it was also a great opportunity for reconstruction according to new rules and new principles. The Borzì Plan of 1911 is a point in case. Under the exhortation to build "new and autonomous cities" with respect to the pre-existing ones, it tried to rebuild the city according to rules that take seismic activities into consideration on the one hand, but fed the imagination of some of the most interesting designers of the time, including the young Le Corbusier on the other hand.

An autographed heliography with the inscription "Messine" is Le Corbusier's sketch for the city on the strait (Boesiger, 1960). In this drawing you can see all the architectural features that were later proposed in the Domino for the reconstruction of Flanders destroyed by the Germans in 1914. Le Corbusier's idea was to rebuild entire cities according to new architectural principles without rebuilding the existing cities, which, moreover, provided the rationale to completely demolish what is there.

6.3 The patent for seismic houses, development and materials

The suggestion launched by the Borzì plan for the new Messina, building "new and autonomous cities", also fed the imagination of a young Venetian architect who arrived in the Sicilian city in the aftermath of the seismic event armed with a camera, to record the damage caused. Giuseppe Torres immediately took part in the competition organised by the Lombard Cooperative for Public Works, and less than a month after the earthquake, on 27 January 1909, he filed a patent for "seismic houses" (Torres, 1909). In the years immediately following the earthquake Torres and his brother Duilio produced a huge amount of projects and solutions for aseismic buildings. The principle with which the buildings were designed was very simple and empirical in nature. In the introduction to the patent filing text, Torres indicated that "The Tower of the Winds, the Pantheon, the Colosseum, the Marcello Theatre, the Mole Adriana, the Tomb of Cecilia Metella, the Temple of Vesta, were witnesses of the classical art of building left to us which affirm the supremacy of a system with bases and circular forms in providing order and stability. "(Torres, 1909). He also underlined how many Sicilian circular-based buildings survived destructive seismic action. Torres then delved into a series of geometric-static formulas in an attempt to justify his own idea.

Torres probably also recalled the principles of Daniele Donghi who worked in Venice as head of the technical office of the municipality since the collapse of the bell tower in 1902. Donghi in his architect Manual wrote: "…reinforced concrete is the best material that is known to build monolithic, non-deformable, elastic houses, which are required for earthquake-prone countries, and which also has the advantage of being indestructible and fireproof…" (Donghi, 1909). Torres demonstrated a certain autonomy and safety in the realisation of construction details he also elaborated, showing a good familiarity with the cement material. The father of the Torres brothers was in fact a cement manufacturer with a factory in Vittorio Veneto, and the Messina earthquake was probably an opportunity to develop his knowledge and perfect new construction techniques.

The patent buildings that Torres conceived are configured as a continuous study and development starting with a private assignment, "Casa Puleo". In the project drawings,

Torres adapted the bundle shape of circles to the pre-existing condition of the new 1911 Borzì Plan. It is an urban building with an internal courtyard that looks directly onto the highway. Torres's compositional skills in this case were tested by the extremely rigid condition of the new road link and by the difficulty of adapting circular shapes to such a rigorous condition.

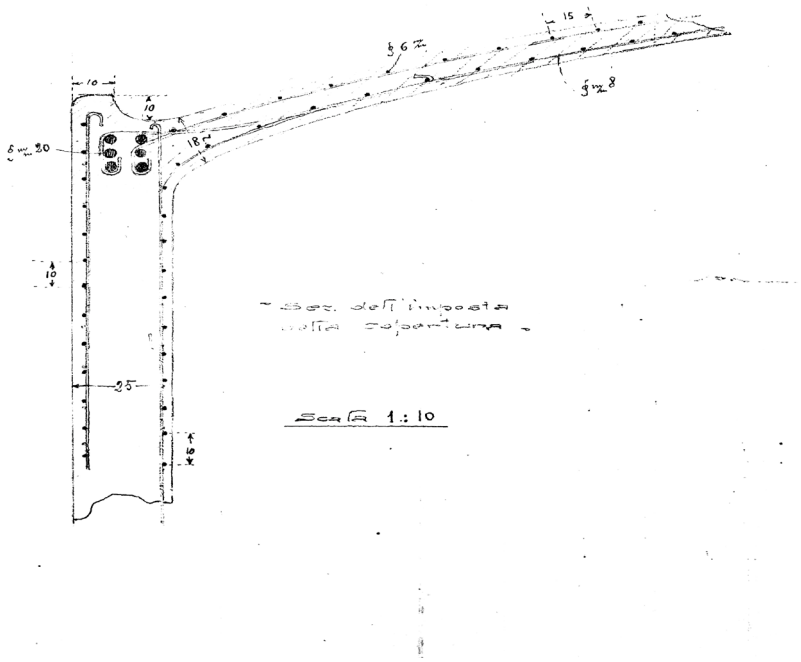

Fig.6.1 Study design for the detail of the Messina Chamber of Commerce. (source: Giuseppe Torres, Iuav-Archivio Progetti)

The design virtuosity of the Torres brothers was displayed in two successive competitions. The first was the competition for the town hall of Messina launched in 1910. In the lot assigned by the competition Torres inserted five volumes separated from each other by squares and tree-lined spaces. The volumes were the continuous iteration of bundles of monolithic reinforced concrete cylinders. It is in this project that Torres also developed the first executive construction details. The drawings describe the masonry equipment as the only minimal-thickness cementitious flows then covered with concretions of coloured majolica. The static function was left exclusively to the monolithic reinforced concrete and the dense mesh of reinforcement bars arranged in plan spokes, which permitted to form lowered domes on the fifth level (akin to a sort of aviary for birds). The thickness of the perimeter walls was only twenty-five centimetres, while the domes were reduced to fifteen centimetres. The reinforcement bars were eight millimetres in diameter and only ten centimetres distant from each other.

The second competition in which the Torres brothers participated was the one for the Messina Chamber of Commerce of 1911. In this competition the Venetian architects repeated the system of several buildings on a lot already experimented for the Town Hall, modifying the lowered domes into a series of semi-circular domes with large skylights to allow the sun to enter. In the project for the Messina Chamber of Commerce, Torres highlighted in an in-depth analysis for the project for the Town Hall, the full capacity of the use of reinforced concrete, evidenced by increasingly precise and executive designs.

6.4 The module design

The theme of the circle, and its repetition, entered Torres' design grammar at the occasion of the reconstruction of Messina, but it remained a constant leitmotif until the architect's death in 1935. However, the reason for such an original planimetric pattern cannot be traced to purely static-structural needs, but refers to a much older compositional tradition, which Torres made his own and developed continuously.

The panorama of Italian architecture of the late nineteenth and early twentieth century was dominated by figures such as Ernesto Basile, Raimondo D'Aronco and Gino Coppedè who attempted to impose the Art Nouveau style in Italy, adapting it to forms close to the sensitivity and traditional architectural style of the Bel Paese. It was D'Aronco who in 1902, on the occasion of the Turin Expo, proposed a circular pavilion, whose shapes and above all decorative apparatus Torres took up for the design of the Garage Marcon in Mestre in 1907.[1] D'Aronco was formed in Venice, and it is likely that he was recognised by Torres as one of the leaders of the Italian Liberty movement. But if the Friulian architect developed a personal Art Nouveau taste close to the experiences of Van De Velde and Victor Horta, Torres inclined his lexicon to a more properly Venetian sensitivity. Venice was in fact the main and fundamental inventory from which Torres took his own personal style which distanced him from the experiences of his contemporaries and enabled him to develop an autonomous formal language. The house in Rio del Gaffaro ai Tolentini of 1905 was the most successful example of Torres' eclecticism, in which the canons of the Venetian morphological tradition fully expressed themselves.

If Casa Puleo in Messina was the first attempt of Torres to adapt a technical-construction system to a formal sensitivity in vogue in those years,[2] it was in the competition projects for public buildings in Messina that Torres revealed his Venetian sensitivity. The main reference for the planimetric circle composition was certainly the layout of the Byzantine sacred buildings, and mainly the Basilica of San Marco. The "ad quinquies"[3] composition system enabled Torres to develop around a large central space a series of other minor circular environments which were repeated obsessively and combined symmetrically in turn.[4]

The figures that were generated formed highly complex patterns in which the repetition of the circle revealed a clear and continuous distribution pattern. The Marciana basilica

1 Zucconi G. (2001), in Domenichini R. *Giuseppe Torres 1872-1935. Inventario analitico dell'archivio, Padova*: Il Poligrafo, p. 11.
2 È interessante notare la similitudine con D'Aronco in Casa Fenoglio a Torino del 1902 per la soluzione d'angolo all'incrocio tra due strade perpendicolari
3 Zucconi G. (2001), in Domenichini R. Giuseppe Torres 1872-1935. Inventario analitico dell'archivio, Padova: Il Poligrafo, p. 20.
4 R. Domenichini (2017), in C. Furlan, G. Zucconi a cura di, *Giuseppe Torres, Il Restauro del Castello di Spilimbergo (1911-1912).* Fondazione Ado Furlan, Iuav Archivio Progetti, Udine: Forum, p. 29.

was also a model for raised solutions. The roofing system that Torres provided for large buildings referred to the system of lowered domes of the Byzantine Basilica, and the system of openings referred to the model of Venetian mullioned windows.

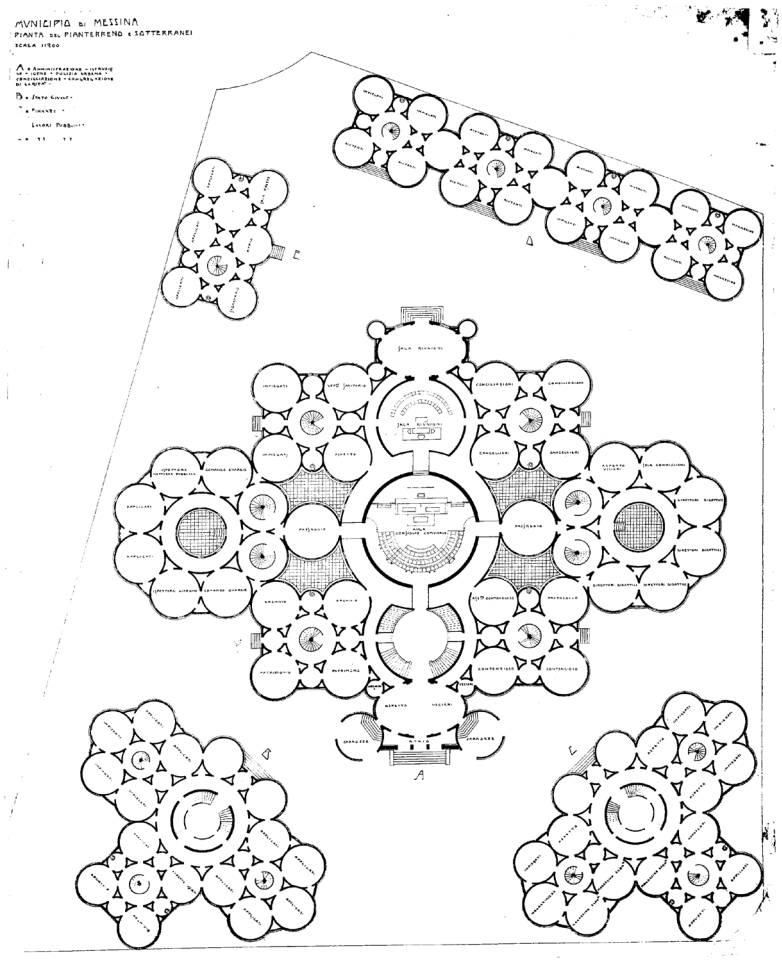

Fig.6.2 Competition design for the Municipality of Messina. Overall plan of the Municipality of Messina. (source: Giuseppe Torres, Iuav-Archivio Progetti)

6.5 Representing reconstruction

Over the years Torres constantly tried to promote his idea of a new Messina. The success that the project had attracted appeared in the newspaper clippings and in the testimonies collected by Torres. Many were appeals of leading figures, of Venetian and non-Venetian culture, who wanted Messina rebuilt according to the patent for aseismic houses compiled in a publication by Torres (Torres, 1911).[5] It is probable that the authors of the appeals referred to a particular drawing, preserved in the Iuav archives, which returned

5 Torres G. (1911), Giudizi e pubblicazioni relativi al sistema di casa asismica, brevetto architetto G. Torres, Vittorio Veneto: Stabilimento tipografico Bigontina & Meneghelli

constantly. The design, made in two versions, a bird's eye view from the sea and the other a view from the walking surface, shows a Messina "all round and pink on the Gulf" (Torres, 1911)[6] made by a continuous curtain of circular buildings similar to a large coral reef. The "Capriccio" views of Messina were an integral part of Torres' progress as promoter of himself. Over the years, the Venetian architect developed a great sensitivity in knowing how to present his projects to his customers.[7]

6.6 Settlement plans

For almost the entire duration of his activity Torres developed and elaborated some interesting projects, albeit destined never to come to light. The project for the workers' villas for the Marzotto of 1907 in Valdagno, the project for the 60,000 square meter neighbourhood in the Sacca di Sant'Elena of 1911, the CIGA Competition for one hundred villas to be built on the Lido of Venice in 1914, the big projects of Messina in 1909-11, the projects for the seismic huts of Avezzano in 1915, and finally the project for the Worker's Village in Milan in 1926 were perhaps the expression of the desire of the Torres Brothers to build an entire city set on the same formal structures as those conceived for his seismic patent. Regrettably also for Torres, the competitions launched to create new urban structures are an unlucky field of action for designers from the academic world, who are often criticised for solutions that are not very functional and lack technical and economic efficiencies.[8]

The attention of both Torres brothers over the years towards the urban scale made the overall work of the designers even more interesting. Ideas for cities were always the result of deep thought, linked not so much to formal expression, but to a philosophical approach to the project. It is the most profound exaltation of the "beauty worker"[9] capable of combining principles of philosophical life and architectural practice that pervades the world, which Torres evidently felt very strongly about. For Torres, the forms were not an end in themselves to the exaltation, but the consequence of a reflection regarding the project as a whole. The architectural objects, at each scale, were generated as a consequence of a deeper thought linked to the development of human life.

6.7 Bad luck of the Torres patent, but a brilliant legacy

The Torres patent constitutes a decisive testimony in the field of reconstruction. Despite the failure of the Venetian architect's enterprise, what he leaves behind is emblematic of a very sophisticated and refined design attitude. What each Torres project has in common is the search for a very clear settlement principle, the realisation of which is entrusted in an innovative, simple construction system.

6 Torres G. (1911), Giudizi e pubblicazioni relativi al sistema di casa asismica, brevetto architetto G. Torres, Vittorio Veneto: Stabilimento tipografico Bigontina & Meneghelli. p. 17.

7 The views he created, not only for competitions, but also for modest assignments, were designed to be similar to the sensitivity of the client, or in any case to strike and leave a strong impact on the imagination. Examples of the attitude with which Torres promoted his work were some significant drawings for Casa Robertson, in which we note the inspiration for the Ruskinian representation requested by customers, or the triumphal drawings made for the monuments to the fallen soldiers after the end of the First World War in Friuli and Veneto, and some powerful representations for the Competition for the Station of Florence and the Competition for the Palazzo del Littorio in the early thirties

8 Domenichini R. a cura di (2001), Giuseppe Torres 1872-1935. Inventario analitico dell'archivio, Padova: Il Poligrafo.

9 Domenichini R. a cura di (2001), Giuseppe Torres 1872-1935. Inventario analitico dell'archivio, Padova: Il Poligrafo, p. 38.

In the competition projects for the Town Hall and for the Messina Chamber of Commerce, in particular, Torres was not limited to the design of a single building, but to the aggregation of several buildings consistent with the idea of a "round" city. The shape became simultaneously a settlement and constructive principle which was repeated from the building to the city. In the case of the reconstruction of Messina, the circular buildings were an example of a principle adaptable to any condition and function, including seismic conditions and which in all respects constituted a new building type.
What is common to every Torres project is the search for a very clear compositional principle, whose implementation is entrusted to an innovative, simple and congruent construction system that must support it. In the Project of competition of the Municipal-

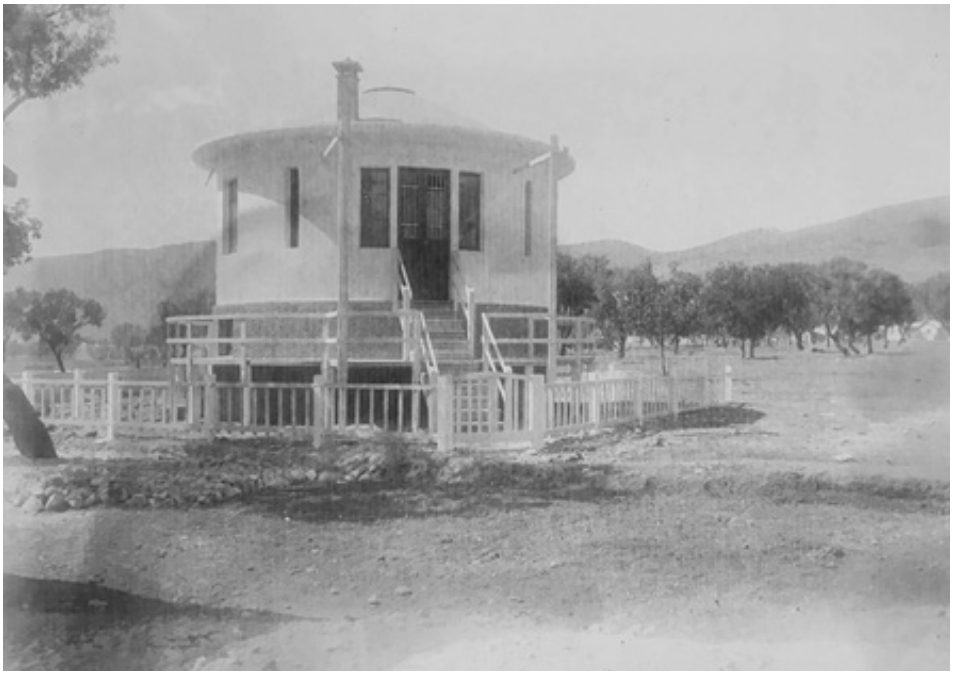

Fig.6.3 Slide portraying one of the asismic huts built by the Brothers Giuseppe and Duilio Torres in Avezzano. (source: Giuseppe Torres, Iuav-Archivio Progetti)

ity and the Chamber of Commerce of Messina, the fact that Torres did not limit itself to the design of a single building, but to the agglomeration of several buildings in the same lot it was consistent with the idea of a "round" city, since the basic circle was not an end to the form itself or to its enjoyment, but it was a building and constructive principle at the same time, capable of further developments. In the case of the reconstruction of Messina, the circular buildings were a good example of a repeatable principle, adaptable to every condition and to every function, which constituted a new type to all effects.

The originality in the Torres Project resided in the new concept of the Architecture plan. The transcalarity with which the buildings were designed are an example. What made the Torres Patent an example of originality and modernity was the indissoluble union between form and structure in the use of new construction systems.

The reference to Le Corbusier's Domino project is decisive for a better understanding of the new sensibility that spread throughout Europe at the dawn of the twentieth century. The search for the original coincided with the proposal of new settlement systems, and thereby overcoming the boundaries between urban planning and architectural design. The fact that Torres proposed a new type for the reconstruction of Messina, constituted an example of a new, modern mentality, capable of becoming a model in the field of reconstruction.

Reconstruction is an opportunity to rethink how humankind lives in the world. The opportunity for the reconstruction of Messina was the basis for rethinking new visions. Torres' aim was to build an imaginary based on the actual possibilities of a new reality. The need to rethink the way in which human settlements are defined opened Torres a way to new experiments in the field of structures with seismic resistance, as well as with the overall design of settlements, the management of new interventions, the overall economy of the works and, above all, the way for humankind to inhabit the world.

References

Boesiger, W., 1960. Le Corbusier et Pierre Jeanneret ouvre complete, 1946-1952, Zurich: Les Editions Girsberger, p. 26

Domenichini R., Giuseppe Torres 1872-1935. Inventario analitico dell'archivio, Padova: Il Poligrafo

Donghi D., 1909. Manuale dell'architetto, Appendice

Furlan C., Zucconi G., a cura di, Giuseppe Torres, Il Restauro del Castello di Spilimbergo (1911-1912). Fondazione Ado Furlan, Iuav Archivio Progetti, Udine: Forum

Mamoli M., Trebbi G., 1988. "Storia dell'Urbanistica, L'Europa del secondo dopoguerra", Laterza, Roma-Bari

Norme tecniche ed igieniche obbligatorie per le riparazioni, ricostruzioni e nuove costruzioni degli edifici pubblici e privati nei Comuni colpiti dal terremoto del 28 dicembre 1908 o da altri anteriori, R.D. 18 aprile 1909, n. 193, art. 3 (Pubblicato nella gazzetta ufficiale n. 95 del 22 aprile 1909).

Tacconi G., 2016. Ricostruzione post sisma: Messina 1908, la città che visse due volte, in www.Ingegneri.info/Urbanistica, 22 Settembre 2016.

Torres G., 1909. Arch. G. Torres, La casa asismica, Brevetto, Sistema di costruzioni per regioni soggette a movimenti sismici, formate da edifici ad aggruppamento tubolare cilindrico o poligonale principalmente in cemento armato poggiati su fondazioni monolitiche, Roma: Cooperativa Editori

Torres G., 1911. Giudizi e pubblicazioni relativi al sistema di casa asismica, brevetto architetto G. Torres, Vittorio Veneto: Stabilimento tipografico Bigontina & Meneghelli.

Treccani G. P., 2015. "Monumenti e centri storici nella stagione della Grande Guerra", Franco Angeli Editore, Milano

Seismic behaviour of the structure of the Convent San Juan Bautista de Tetela del Volcán, Mexico

Patricia Alarcón-Chaires, University of Michoacán, Mexico riskplanet@gmail.com
Laboratorio de Modelos Estructurales y Ensayes Sísmicos Faculty of Civil Engineering. Ciudad Universitaria

Mario Benhumea-León, Seismocontrol, S.A. de C.V., Mexico seismocontrol@gmail.com

M. Cristina García-Nieto, Universidad Politécnica de Cartagena (UPCT), Spain
Mining and Civil Engineering Department cristinagarcianieto@gmail.com

Marcos A. Martínez-Segura, Universidad Politécnica de Cartagena (UPCT), Spain
Mining and Civil Engineering Department marcos.martinez@upct.es

Abstract

This research describes the seismic behaviour of the convent of San Juan Bautista de Tetela del Volcán observed during the earthquake which occurred on 19 September 2017. Several records of acceleration were obtained of this seismic event with the epicentre in the vicinity of the town of Axochiapan in Morelos State, Mexico. They are analysed, and one is selected which is considered representative of the movement of the seismic phenomenon on the site. The construction of the monastery of San Juan Bautista began in 1571 by order of the Dominicans. It was completed in 1585 by the Augustinians and is located 16 kilometres from the Popocateplet volcano. The building forms part of a group of fourteen monasteries declared World Heritage by UNESCO.

Field research consisted of geological studies and geophysical tests with non-destructive tests. They are used to determine the propagation velocities, buffer fractions, dynamic elastic modules and periods of vibration of both the soil and the structure. They are integrated with structural schemes which allow us to develop theoretical models in two dimensions and in space. Due to the heterogeneous nature of the masonry, the study was carried out with numerical analysis techniques that incorporated in their approach the non-linear behaviour of the structure by using the Abaqus CAE program. The theoretical results of the resistance and deformation impacts were analysed, as well as the results of the field evaluation of the damage level of the structure, comparing the behaviour of the structure during the seismic event with the theoretical model of nonlinear performance analysis. In this study, the scope of the analysis of the non-linear Finite Element Method and its application to the modelling of historical monuments was analysed. The objective of nonlinear seismic analysis is to predict the behaviour of a structure in the face of future earthquakes.

Keywords: Historical heritage, Seismic vulnerability, Non-linear analysis, Axochiapan, Morelos State, Mexico

7.1 Introduction

On 19 September 2017, an earthquake occurred with a magnitude of 7.1 (Mw) whose epicentre was in Axochiapán, Morelos (SSN, 2017). It is considered that the earthquake took place within the limits of Puebla and Morelos with coordinates 18.4 latitude N and -98.72 longitude W, at a depth of 57 km, within the Cocos plate, at a depth of 38.5 km. On 7 October 2017, one of the largest earthquakes recorded in Mexico occurred, the Oaxaca-Chiapas earthquake, concentrating the damage in the State of Morelos. Damage was caused to historical monuments and buildings collapsed in Mexico City.

The seismic event of 19 September 2017 produced a few aftershocks. However, it increased the seismicity of the small geological faults found in the State of Morelos, locating the epicentre close to Mexico City. This event is considered the second most damaging earthquake in modern seismic history of Mexico (Table 7.1), registered inside the North American plate, called "intra plate earthquake" (Fig.7.1).

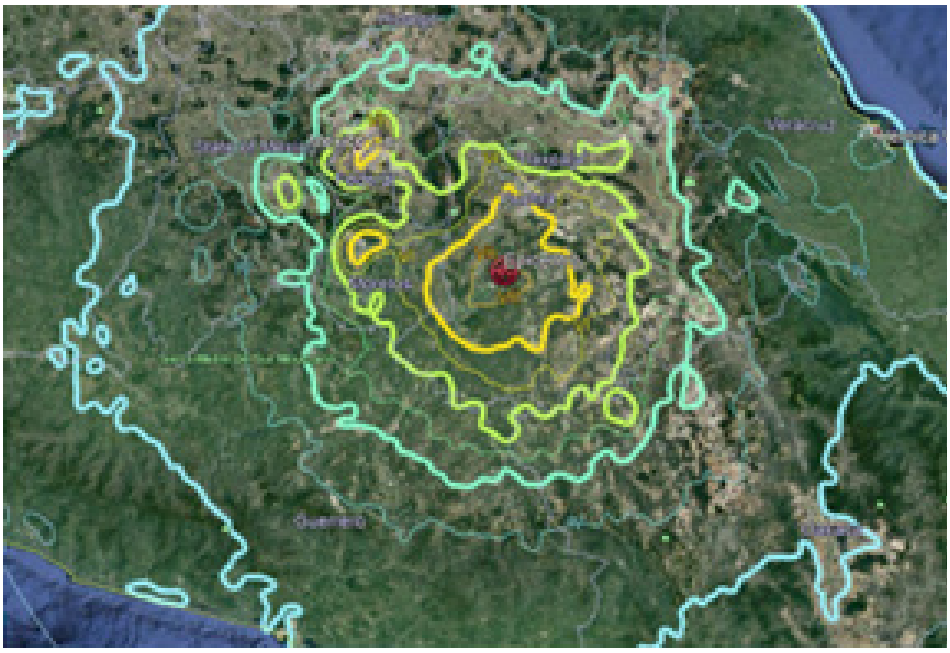

Fig.7.1 Map of estimated intensities (source: National Seismological Service[1], Drawings by author)

1 http://www.ssn.unam.mx/sismicidad/reportes-especiales/2017/SSNMX_rep_esp_20170919_Puebla-Morelos_M71pdf:

Table 7.1 Maximum Accelerations registered in some sites in the Valley of Mexico (source National Seismological Service[2])

Place	Maximum acceleration registered (Gal)
Tlamacas. Edo México	112
Ciudad Universitaria	54
Coyoacán	60
Tláhuac	32
Cuajimalpa	20
Tlalpan	90

The level of damage inflicted by the earthquakes in September 2017 in Mexico, showed the high vulnerability of historical monuments. Most of them had severe damages or collapsed (Table 7.2). A total of 1603 damaged historical monuments were recorded. Among these damaged monuments are the monuments of the Ruta de los Conventos, built during the sixteenth century and located on the slopes of the volcano Popocatepetl. The level of damage observed during the earthquake of 19 September 2017 showed the high vulnerability of historic monuments. These buildings suffered severe damages and partial as well as total collapses.

Table 7.2 Historical Monument Damage Statistics (source: Observatorio Nacional de la Conferencia del Episcopado Mexicano, OCEM[3])

Entity	Damage			Total damaged Historical monuments	Percentage (%) respect to the total damaged Historical monuments
	Severe damage	Moderate damage	Minor damage		
Chiapas	21	29	64	114	4.90%
Mexico City	51	65	81	197	8.40%
Mexico State	52	135	92	279	11.90%
Guerrero	11	41	43	95	4.10%
Hidalgo	2	6	5	13	0.60%
Morelos	122	84	53	259	11.10%
Oaxaca	34	308	245	587	25.10%
Puebla	125	335	161	621	26.50%
Tabasco	1	2	24	27	1.20%
Tlaxcala	11	12	111	134	5.70%
Veracruz	1	2	11	14	0.60%

2 http://www.ssn.unam.mx/sismicidad/reportes-especiales/2017/SSNMX_rep_esp_20170919_Puebla-Morelos_M71.pdf
3 http://www.es.catholic.net/archivos/informe-emplos-danados.pdf

According to the levels of cracking and the faults observed in the buildings, the elements that suffered the greatest vulnerability to seismic events were arches, vaults, domes, bell towers, against forts and drum towers (Fig.7.2). As for the foundations of the buildings, the problems were minimal or non-existent. Finally, the elements that suffered the least damage, presenting small cracks, were the longitudinal walls due to the concentration of efforts in door and window openings.

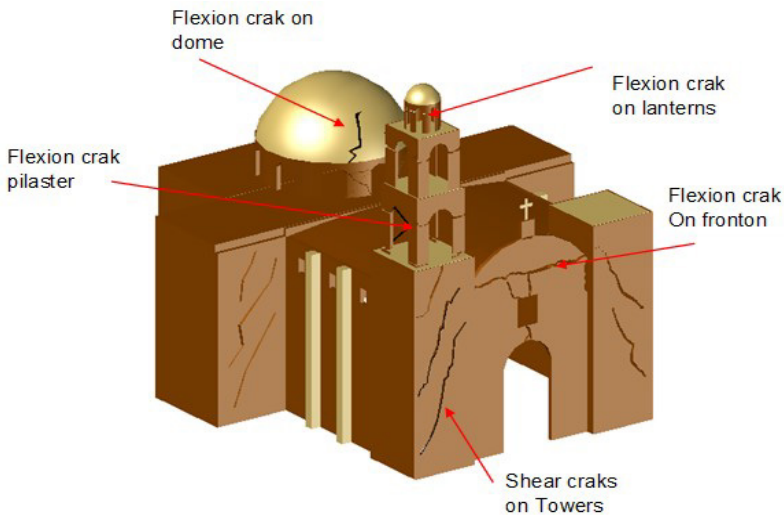

Fig.7.2 Typification of damage to historic monuments (Churches) (source: Alarcón, 1997).

Seismic resilience is the ability of a system to minimise the level of damage upon the occurrence of a seismic event, and to recover its functionality in the shortest possible time. However, it is difficult to claim that historic monuments are seismically resilient, unless structural restoration was carried out before a damaging earthquake occurs.

An innovative approach to seismic engineering involves the integrated work of two independent structural systems. One system lowers the gravitational loads and the other controls the lateral response of the building. In the specific case of historical monuments, there are different variables that are difficult to control, such as the natural deterioration of the structure, the deficient resistance to withstand cutting forces in masonry elements, the degradation of rigidity, the deterioration of materials due to rain, etc. In this work, neither the foundation nor the soil-structure interaction effect were considered. Its focus was to obtain the state of stresses and displacements using the accelerogram of the earthquake of 19 September 2017. The first stage of this investigation consisted of a rapid or emergency assessment of the damage, reviewing the mechanism of collapse of the monument under study. Subsequently, a risk assessment of the structure was carried out by performing inelastic dynamic analyses with the accelerographs of the earthquake of 19 September 2017.

7.2 Background of the Historical Monument of the Chapel and Ex-Convent of San Juan Bautista

Tetela del Volcán is a municipality located in the north eastern area of the State of Morelos in Mexico. The word Tetela comes from the Nahuatl root "Tetella", which means "rough land of mountains and hills" or "Tetetla", which means "stony place". It was here that a convent was built and assigned to the Dominicans before 1562. Due to the intra-plate and volcanic earthquakes that occur in the area of study, the chapel and ex-convent of San Juan Bautista de Tetela del Volcán with its chapel is a monument that has been affected by different earthquakes throughout their history (Fig.7.3).

It is considered that the most important damage to this monument was caused by a high intensity earthquake (unknown) in the 18th century. During this earthquake, the original vaults collapsed and were rebuilt in the 19th century (Ledezma L., 2012). The existing buttresses make the building into a kind of fortress, but it is worth mentioning that the mural painting inside the cloister of the convent and the great atrium are uneven towards the east.

The cultural and historical richness of this monument is also associated with its polychrome mural painting and the corridors decorated with murals of phytomorphic crosses (Fig.7.4)

Fig.7.3 Church and Ex-Convent of San Juan Bautista de Tetela del Volcán, before the 2017 earthquake (source: author)

Fig.7.4 Decorated corridors of the Ex-Convent of San Juan Bautista de Tetela del Volcán (source: author)

The Ex-Convent of San Juan Bautista has a high degree of exposure to seismic events. Its high cultural and monumental value (tangible and intangible values), were the reasons to consider it as an object of study and research.

7.3 Description of the structure

This monument has a rectangular floor plan, 35 meters long and 10.5 meters wide. The doorway of the chapel has a semi-circular arch, framed by a panel (alfiz) over a window that corresponds to the semi-circular choir, also framed by panel. It has a buttress at 45 degrees framing the whole. The roof is formed by four lunette vaults. The choir is lo-

cated at the entrance of the chapel. An important part of this monument is the sacristy, which joins up to the antechamber and this, in turn, leads to the chapel through the presbytery.

The sacristy is 10.6 meters long and 5.25 meters wide. With respect to its roof, it has a single order of beams supported by stirrups, which in turn are supported by corbels that surround the entire rectangular space. The main building consists of a nave and four buttresses. The building material consists of volcanic stones (basalt and tezontle), bound by a mortar of lime and sand. The masonry used in the building is heterogeneous, with tezontle and basaltic stone, joined with mortar of lime and sand. The columns and arches are made of ashlar stone masonry. The composition of the building materials, as well as the volumetric weight and mechanical properties vary according to the construction elements and the periods in which each part of the construction was carried out. The structure of this building is rectangular. There is a high density of walls in both directions of the seismic analysis and a certain structural symmetry exists in the area of the convent. It is a very rigid structure.

When analysing the seismic configuration of the building, it can be seen by the abrupt change of rigidities that the structure of the tower in union with the parish and the latter with the convent, form a structural asymmetry. This important difference in rigidity produces torsional moments in the tower structure. These are mechanical elements that have been observed during non-linear analysis of the structure.

7.4 Research and inspection

In order to analyse the damaged monument taking into account the overall behaviour of the structure, different stages of study were undertaken. They are the analysis of past conditions, the analysis of current conditions (level of damage), the analysis of future conditions, and the determination of the numerical analysis.

The historical documentation of the monument enabled us to understand its structural behaviour, having information about its construction and its location in a highly seismic area. Marking the areas damaged by past earthquakes for the analysis of the monument facilitated a chronological analysis of the damage and modifications made, and to understand how these modifications led to the change in structural behaviour. The following work was carried out systematically: the analysis of the damage, the characteristics of the materials (in general), the structural problems, the seismic configuration of the monument and the loads (dead, live and accidental).

Moreover, an investigation was conducted on the conditions of collapse, settlement of the structure, and levels of cracking. The level of damage to all structural elements (buttresses, towers, floor and wall systems in structures based on structural walls) was analysed.

Table 7.3 Characteristics of the materials obtained with non-destructive tests (source: author)

Material	E (ton/m2)	ν	ρ (Ton/m3)
Basaltic stone	3200000	0.22	2.9
Masonry	1000000	0.22	1.5

7.5 Numerical analysis

Mathematical models for this type of structure continue to present a challenge as regards the characterisation of the constructive system constituted by stone masonry and mortar. It revealed a heterogeneous system with different values of resistance to compression of the stone and mortar (Table 7.3). Its resistance to shear stress is little or nil. The types of analysis for this type of structure can be classified into:

1. according to their function: analysis for validation and calibration; analysis for evaluation and calibration;

2. taking into account the behaviour of the material: linear-elastic analysis; inelastic analysis;

3. depending on the type of load: dynamic analysis; static analysis.

The objective of nonlinear seismic analysis is to predict the behaviour of a structure in the face of future earthquakes. This prediction is used to make decisions for the safety and risk of the structure. In recognition of improved estimates of nonlinear analysis, the acceptance criteria for nonlinear procedures is more accurate and less conservative than those for linear procedures. The non-linear analysis was born as an alternative to discover the vulnerability present in buildings when subjected to lateral loads caused by earthquakes (Fig.7.5).

Several records of tremors obtained in this seismic event are analysed, selecting the most representative. Given the record and using approximate procedures of elastic and inelastic analysis, the demands of resistance and deformations on these types of structures are studied.

The Process Analytical Modelling was made by algorithm, following these steps:

a) definition of seismic excitations of interest;

b) collection of building information;

c) classification of structural components;

d) structural damage data;

e) structural damage;

f) classification of damage in structural components;

g) development of analysis model;

h) verification of analytical model;

i) damage impact evaluation;

j) restauration measures.

The analyses were carried out with the Abaqus CAE system. The model was constructed with 203 characteristics and 279989 knots, in order to predict its probable behaviour before the earthquake and to compare this analytical model with the real behaviour of the historical monument during the reference seismic event.

This type of construction has accumulated problems of progressive instability during its "useful life". This was due to structural deterioration caused by the lack of maintenance of its elements, as well as to atmospheric agents that degrade the capacity of the materials. In addition, the seismic events registered have increased the vulnerability of the structural behaviour of these types of building. The model was carried out without considering the construction processes, nor the cracks and damages suffered in previous earthquakes. The analysis considered was non-linear with the Finite Element Method using solid elements.

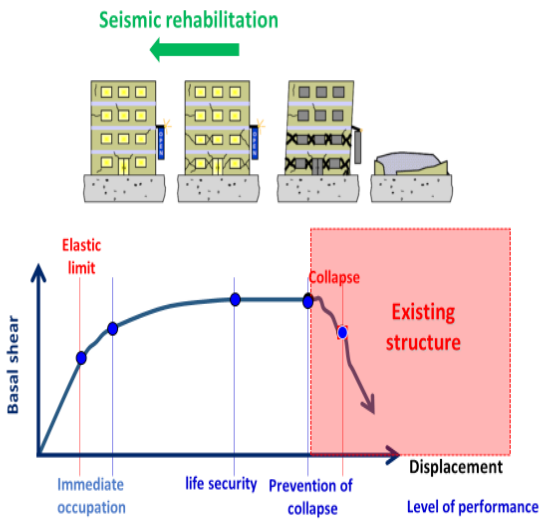

Fig.7.5 Performance level criteria (source: Teran, 2018)

7.6 Results

The model permitted to analyse the dynamic response of the structure, during 45 seconds, time in which the maximum accelerations of the terrain were noted. The results demonstrated a behaviour compatible with that presented before the earthquake of 19 September 2017. It is observed that the distribution of forces and bending moments (Fig.7.6) correspond to the cracks observed and measured in the physical evaluation of the monument.

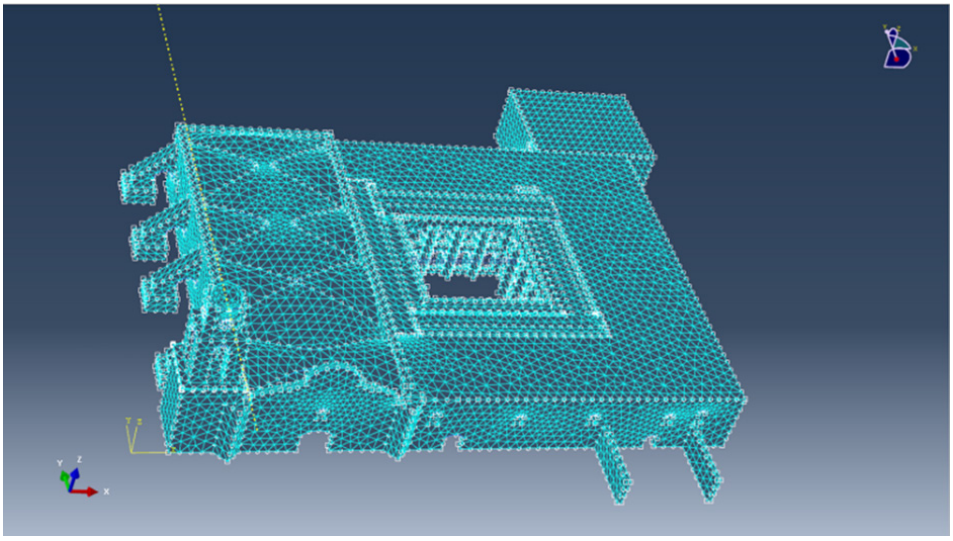

Fig.7.6 Finite elements of the numerical models (source: author)

As can be seen in Figure 7.7, the modelling of this building was able to validate the state of cracks and deformations that occurred in the real structure after the earthquake. The deformed configuration of the tower that has been obtained after the analysis is analogous to the behaviour that was presented in the royal historical monument after the earthquake.

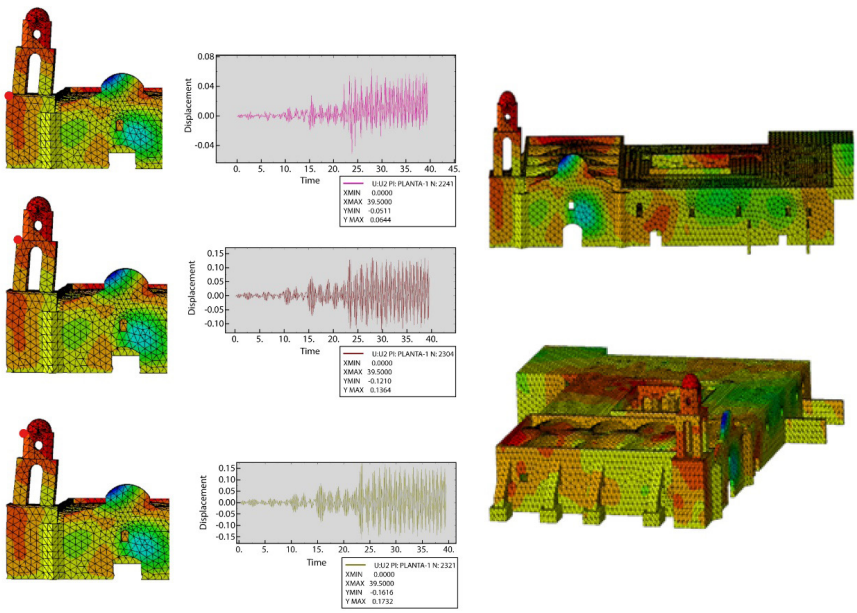

Fig.7.7 Displacements generated by the earthquake of 19 September 2017 (source: author)

The maximum displacements of the tower had values of 0.18 m in the dome and 0.14 m in the lanterns, which caused its collapse, as well as sharp cracks in its structure. The rest of the complex presented shear cracks in its walls and buttresses, as well as flexion cracks in the pediment. It is also observed that the concentration of stress in door openings is compatible with the analytical model (Fig.7.8).

Fig.7.8 Church after the earthquake of 19 September 2017 (source: author)

7.7 Conclusions

The statistical evaluation of damage during the earthquake of 19 September 2017 showed the high vulnerability of historic monuments. Most of them were classified with severe damages and collapses. The non-linear Finite Element Model enabled us to estimate the structural response of the Church and ex-convent of San Juan Bautista located in Tetela del Volcán in a congruent way.

These results are important considering the large number of historical monuments built in Mexico that need to be studied. In recognition of improved estimates of nonlinear analysis, the acceptance criteria for nonlinear procedures are more accurate and less conservative than those for linear procedures. Buildings that do not comply with the linear analysis acceptance criteria may comply with nonlinear acceptance criteria.

The construction of these types of analytical models can be useful in the evaluation of seismic behaviour in future earthquakes. However, it is necessary to improve the evaluation of the mechanical characteristics of the structure under study.

There are four analytical procedures that can be used, including Linear Static Procedures and Linear Dynamic Procedures. The nonlinear procedures have fewer conservative limits on permissible buildings response than linear procedures.

The acceptance criteria have been specified using actual laboratory test results, where available, supplemented by the engineering judgment of various development teams. Engineering judgment should be exercised in determining the applicability of various analytical techniques and material acceptance criteria in each situation.

References

Alarcón, P., Beltrán, J., Peralta A., Magaña, C., 2018. Comportamiento sísmico de Iglesias dañadas en Puebla y Morelos durante el sismo de Axochiapan, Morelos, del 19 de septiembre de 2017, México. Lorca.

Alarcón P., 2000. Manual de evaluación de estructuras dañadas de mampostería. Facultad de Ingeniería Civil de la Universidad Michoacana de San Nicolás de Hidalgo, 2000.

Clementi, F., Gazzani, V., Poiani, M., & Lenci, S., 2016. Assessment of seismic behaviour of heritage masonry buildings using numerical modelling. Journal of Building Engineering, 8, 29–47. https://doi.org/10.1016/j.jobe.2016.09.005.

Ledezma L., 2012. www.inah.gob.mx.

Reporte especial, 2017. Servicio Sismológico Nacional.UNAM. 2017. Rescatado de: http://www.ssn.unam.mx/sismicidad/reportes-especiales/2017/SSNMX_rep_esp_20170919_Puebla-Morelos_M71.pdf Informe Especial Sismo del 19 de Septiembre de 2017. Servicio Sismológico Nacional. 2017.

Maniatakis, C. A., Spyrakos, C. C., Kiriakopoulos, P. D., and Tsellos, K. P., 2017. Seismic response of a historic church considering pounding phenomena. Bulletin of Earthquake Engineering, 1–29. https://doi.org/10.1007/s10518-017-0293-5.

Martínez Segura, M.A., Navarro Bernal, M., Martínez Pagan, P., 2017. Riesgos sísmicos en la Región de Murcia y métodos de evaluación de la peligrosidad sísmica a escala urbana, in editum (Ed.), LOS RIESGOS AMBIENTALES EN LA REGIÓN DE MURCIA. Ediciones de la Universidad de Murcia, Murcia, pp. 35-57.

Melli Piralla R., 1998. "Ingeniería Estructural de los Edificios Históricos", 1ª Edición, Fundación ICA A. C., 217 p.

Navarro, M., et al., 2000. Relation between the predominant periods of soil and the damage distribution after Mula 1999 earthquake. Sixth International Conference on Seismic Zonation, California.

OBSERVATORIO NACIONAL DEL EPISCOPADO MEXICANO, OCEM., 2018. "Informe de Monumentos históricos dañados por el sismo del 19 de septiembre de 2017". https://es.scribd.com/document/370748196/Informe-Templos-Danados

Sánchez Ramírez A. R., Melli Piralla R., Peña Mondragón y Rodríguez Gutiérrez G., 1998. "El uso de Modelos de Elemento Finito en el Proyecto de Rehabilitación de la Catedral y el Sagrario de la Ciudad de México". Memorias del XI Congreso Nacional de Ingeniería Estructural. Monterrey, Nuevo León. Vol. 2, p.p. 890-899.

Tassios, T. P., 2010. Seismic engineering of monuments: The first Prof. Nicholas Ambraseys distinguished lecture. Bulletin of Earthquake Engineering, 1231–1265. https://doi.org/10.1007/s10518-010-9219-1.

Heritage débris design: between memory and reuse

Paolo Belardi, University of Perugia, Italy
Department of Civil and Environmental Engineering
paolo.belardi@unipg.it

Moreno Marziani, M&G Engineering s.r.l, Italy
morenomarziani@gmail.com

Giovanna Ramaccini, University of Perugia, Italy
Department of Civil and Environmental Engineering
giovanna.ramaccini@gmail.com

Abstract

The seismic events that struck central Italy bring the issue of the risk of loss of cultural heritage to the attention of the technical and scientific debate, reopening questions about the most appropriate methodologies of knowledge, protection and intervention. The application of technological developments to the protection of historical buildings is now well established, with particular regard to technological developments of architectural surveys which make it possible to record complexity with increasing rigour and precision. However, the application of similar technologies is largely unexplored when the object is in a state of ruin. Can knowledge of 'débris' (remains) be subjected to equally rigorous assessment methods? Starting from this question, this contribution aims to communicate the findings of a research project still underway at the Department of Civil and Environmental Engineering of the University of Perugia, as part of examining the safety of the Basilica of San Benedetto di Norcia following its collapse due to the earthquake of October 2016. The San Benedetto site was chosen as an exemplary case study for two reasons. On the one hand, its symbolic value and social impact make reflections on the recovery of its débris central; on the other hand, the delicate operations of disposal of débris are representative of operational aspects that unite similar interventions in post-emergency conditions. The proposed method was aimed to integrate two well-established procedures. One is the fast sheet and the descriptive sheet method, used to identify and catalogue the elements through written notes and photographs; the other are the techniques of laser scanning surveys, offering a digital copy of the débris in an expeditious, detailed and non-invasive manner, or compatible with the condition of urgency that characterises the phase immediately following the occurrence of the calamitous event.

Keywords: Débris, Earthquake, Cataloguing, Project, Architecture, Italy

8.1 Introduction

This project is part of a series of research activities developed within the Department of Civil and Environmental Engineering of the University of Perugia with specific reference to the protection of cultural heritage in relation to calamitous events.[1]

This extremely topical subject is made even more urgent by the occurrence of recent seismic events that have hit central Italy. In particular, if the protection of cultural heritage is outlined as a culturally consolidated issue, the ways of approaching the historic object when it is reduced to fragments is less clear. However, this question cannot be separated from a preliminary reflection on the meaning of the fragments or on the attribution of their value. In this sense, it is not by chance that in this contribution the term débris[2] is used as an alternative to the more widespread synonym of rubble[3]. Although both words describe broken and dispersed substances, previously part of a building or an erect structure, it is only the term débris that embodies the link between the fragment and its derivation from a catastrophic origin. The name was introduced in France in the 18th century, a period of increasing use of gunpowder in Europe. It is used to document fragments from destroyed structures and is associated with the total environmental transformation brought about by the violence of the disaster (Gissen, 2009, pp. 132-133).

While the piles of débris are a problematic aspect in terms of safety, recalling the extreme speed of operations, it is undeniable that they represent a valuable material memory, often forgotten also because of the apparent lack of differences between the fragments in the state of ruin. As effectively described by Paul Auster in the text "In the country of the last things", débris, as a pile of unrecognisable material loses its identity completely:[4]

"A pulverised apple and a pulverised orange are finally the same thing, aren't they? You can't tell the difference between a good dress and a bad dress if they're both turned to shreds, can you? At a certain point, things disintegrate into muck, or dust, or scraps, and what you have is something new, some particle or agglomeration of matter that cannot be identified. It is a clump, a mote, a fragment of the world that has no place: a cipher of it-ness" (Auster, 2018).

However, not all débris is treated in the same way. Following the Italian earthquake of August 2016, the Ministry of Cultural Heritage and Activities and Tourism issued the "Direttiva per le procedure di rimozione e recupero delle macerie di 46 beni tutelati e

1 This chapter presents the partial results of a research activity entitled *Rilievo dinamico delle fasi di recupero dei beni culturali crollati a seguito di eventi calamitosi. Applicazione diretta a un caso studio nel territorio umbro* (Dynamic survey of the phases of recovery of cultural heritage that collapsed as a result of calamitous events. Direct application to a case study in the Umbrian territory) being carried out at the Department of Civil and Environmental Engineering of the University of Perugia developed as part of a scholarship (scientific director: Prof. Paolo Belardi; funding body: M&G Engineering; holder of the scholarship: Giovanna Ramaccini).
2 Cambridge Dictionary. Item Rubble "Broken wood, stones, bricks, etc., that are left **when a** building falls **down or is** destroyed. https://dictionary.cambridge.org/dictionary/english/debris. (Retrieved June 2, 2019)
3 Cambridge Dictionary. Item *Debris* "broken or torn pieces left from the destruction of something larger" https://dictionary.cambridge.org/dictionary/english/debris (Retrieved June 2, 2019)
4 In the English language this aspect is accentuated by the fact that the term débris belongs to the category of non-numerable nouns, whose semantics is characterised by the concept of indistinct matter, that is, without individual traits.

di edilizia storica" (Directive for the procedures for the removal and recovery of rubble of 46 protected and historical buildings) introducing a hierarchical classification of débris by identifying different types. Type A is referring to protected assets, type B to historical buildings and type C to modern buildings without cultural interest. The three types correspond to different procedures dedicated to intervention (Ministry of Cultural Heritage and Activities and Tourism, 2016).

8.2 The case study: The Basilica of San Benedetto di Norcia

The research project here exposed concerns which the survey and cataloguing of the débris of the Basilica of San Benedetto di Norcia developed at the same time as work undertaken on the safety of the facade. As is well known, following the seismic events of 30 October 2016 (Fig.8.1 and 8.2), the Basilica of San Benedetto di Norcia was a heap of débris made up of different materials which ranged from the wooden parts of the roof, to the parts making up the walls, altars, stuccoes and works of art (Fig.8.3). The activity of securing the facade, the only surviving part, has made it necessary to remove the heap of ruins piled up against it. The operations on the facade have been implemented in accordance with dedicated technical standards that classify the débris by distinguishing the fragments to be recovered and the fragments to be discarded.[5] In particular, a distinction is made between elements of high artistic value with main surface development (such as canvases or decorated surfaces), elements of high artistic value with three-dimensional development (such as stone elements, mouldings, decorations of altars) and stone elements that are part of decorated walls or antique irons. When these categories of débris were recovered and stored at the designated sites (such as the Santo Chiodo deposit in Spoleto and the Santa Scolastica deposit in Norcia), the fragments excluded from the above categories were considered as items to be discarded and regarded as waste. The Ministry for Cultural Heritage and Activities collaborated with the ISCR Istituto Superiore per la Conservazione e il Restauro (Institute for conservation and restoration) to take care of the operational aspects. Given the complexity of the site, the ruins of the planimetric layout of the Basilica were regulated through the superimposition of a layout, consisting of 21 quadrants ordered and appointed according to an alphabetical criterion, proceeding from the area of the counter-facade towards the apse. The operations of removing the ruins, which are still ongoing at the time of writing, follow 16 successive phases, implemented by proceeding from the counter-façade towards the apse area.

A storage solution has been devised for each type of débris. Depending on the nature of the débris, the squared ashlars intended for the Santa Scolastica depot have been placed in pallets; the valuable elements intended for the Santo Chiodo depot have been placed in big bags; and material considered to be worthless has been transported to landfill. This phase has been documented through the compilation of a weekly booklet which consists of two sheets aimed at cataloguing the valuable elements intended for the deposits. In particular, the first sheet is designated to the shipping documentation of the element. Here the location of the element is inserted with respect to the dial, the photographic documentation and a brief description, referring, for any further information, to the detail sheet in which important additional information is introduced, such

5 *Messa in sicurezza della chiesa di San Benedetto a Norcia – PG. Interventi di somma urgenza.* Progetto esecutivo. Ministry of Cultural Heritage and Activities and Tourism and ISCR – Istituto Superiore per la Conservazione ed il Restauro.

as the size of the element, its identification through a progressive alphanumeric code, and its destination. In this context, the focus of the research project was to integrate the cataloguing of débris resulting from direct sorting operations with expeditious and targeted documentation, obtained through a series of laser scanner filming operations. The filing and digital acquisition of the débris were carried out at the same time as the operations of securing the facade. This included the removal of the piles that occupied the first four quadrants (A, B, C, D) proceeding by successive levels according to a logic of stratified recovery. The booklet was therefore complemented by a third sheet, aimed at recording the survey beats performed with laser scanning techniques. The potential of this instrumentation is even more evident than the case of the survey of the débris itself. Morphologically complex it offers a high level of accuracy of results. The laser scans are returned using the Leica True View software, which has the advantage of automatically recognising homologous points on images using image matching algorithms and acquiring a virtual three-dimensional model. This amounts to a real "digital clone", measurable through the creation of a complex surface consisting of a regular network of points of known coordinates (xyz), obtaining a manipulable interpretative model, useful for further critical readings.

Fig.8.1 Basilica of San Benedetto di Norcia before 30 October 2016 (source: authors)

Fig 8.2 Basilica of San Benedetto di Norcia after 30 October 2016 (source: authors)

Fig.8.3 Basilica of San Benedetto di Norcia, interior (source: authors, October 2019)

Fig.8.4 Basilica of San Benedetto di Norcia, débris scanning activities (source: authors, October 2019)

8.3 Conclusions

The phases of removal and cataloguing of the débris are central to the acquisition of an appropriate knowledge aimed at outlining future possibilities of regeneration and transmission (Fig 8.6). The information that defines the digital clone, properly selected and interpreted, can be useful both in case of reuse of the fragments in the reconstruction ofthe original object, where the digital copy makes possible virtual operations of re-composition of the image, or in case of renewed use of the fragments, where the digital copy represents a fundamental memory document. The project of the Chiesa delle Macerie (Débris Church), designed by the studio Hoflab Perugia for the reconstruction of the fifteenth-century Chiesa della Madonna di Cascia in Norcia, reduced to a shapeless pile of unrecognisable débris as a result of the events of 30 October 2016, is significant in this sense. Starting from the selection, cataloguing and survey of the fragments, the idea is to propose a new church building, which follows the silhouette of the old church, but whose construction involves a wooden carpentry covered with a "celestial mantle" consisting of the abstract re-composition of the débris (Fig.8.5).

The project is guided by the principle of building "where it was as it was" in which the knowledge of the débris and the attribution of a renewed sense is a necessary condition to guarantee both physical and cultural continuity.

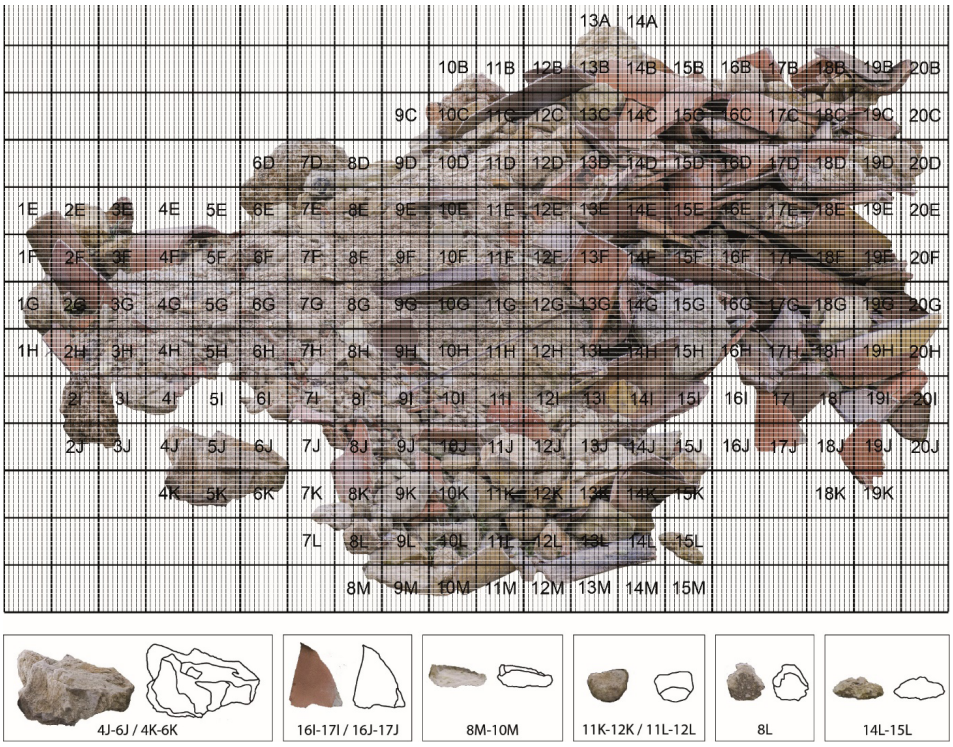

Fig.8.5 Débris of the Chiesa della Madonna di Cascia, cataloguing activities. (source: authors)

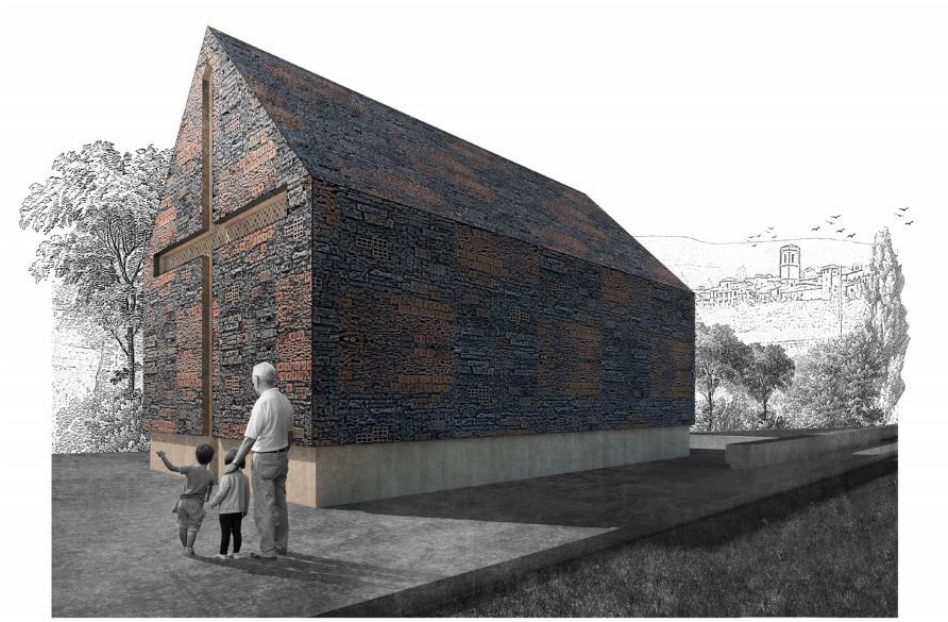

Fig.8.6 Chiesa delle Macerie, infographic simulation, external. (source: authors)

References

Auster, P. 2018. *Nel paese delle ultime cose*. Torino: Einaudi, 33-34 (original title *In the Country of the Last Things*, 1987).

Argenti, S., Betori, A., Corrado, M.L., Crova, C., Fazio, G.M., 2017. La rimozione delle macerie nel post-terremoto. L'approccio propedeutico alla fase della conservazione e del restauro dell'edilizia storica e del patrimonio culturale. *Collana Scienza e Beni Culturali* 2017, 375-387.

Augé, M., 2004. *Rovine e macerie. Il senso del tempo*. Bollati Boringhieri editore: Torino.

Belardi, P., 2018. *Macerie Prime. Ricostruire luoghi ricostruire identità.* ABA Press: Perugia.

D.L. 189/2016, art. 28. *Disposizioni in materia di trattamento e trasporto del materiale derivante dal crollo parziale o totale degli edifici.*

Fenni, B., 2017. La gestione delle macerie prodotte dal sisma, tra esigenze di recupero e rischi sanitari. *Annali della Facoltà Giuridica dell'Università di Camerino* 2017 (6), 71-89.

Gissen, D., 2009. *Suburbs. Architecture's other environment.* New York: Princeton Architectural Press.

Linee di indirizzo metodologiche e tecniche per la ricostruzione del patrimonio culturale danneggiato dal sisma del 24 agosto 2016 e seguenti.

https://www.beniculturali.it/mibac/export/MiBAC/sito-MiBAC/Contenuti/MibacUnif/Comunicati.

(Retrieved July 13, 2019)

Marini, S., 2009. Returning to wasting away. *The New Urban Question-Urbanism beyond Neo-Liberalism* (Proceedings of the 4th International Conference of the IFoU - Amsterdam/Delft 2009), 249-258.

Ministry of Cultural Heritage and Activities and Tourism, 2016. *Direttiva per le procedure di rimozione e recupero delle macerie di beni tutelati e di edilizia storica.*

Silk Cities

The *Fa' la cosa giusta!* exhibition

Generating synergies between schools, museums, and our shared heritage

Alessandra De Nicola, University of Milano-Bicocca, Italy Department of Human Sciences and Education alessandra.denicola@unimib.it

Piero Magri, Terre di Mezzo, publishing house and organiser of Fa' la cosa giusta!, Italy pieromagri@terre.it

Franca Zuccoli, University of Milano-Bicocca, Italy Department of Human Sciences and Education franca.zuccoli@unimib.it

Abstract

Organised by publisher Terre di Mezzo, the Fa' la cosa giusta! (Do the right thing!), exhibition has been held annually in Milan for the past 16 years and is currently Italy's leading exhibition on ethical consumption and sustainable lifestyles. Throughout its history, the event has maintained a strong focus on cultural and educational processes. The 2018 and 2019 editions featured a dedicated section called SFIDE - la scuola di tutti (Challenges - a school for everybody), which explored the role of schools, education and opportunities for educational innovation, offering training sessions for teachers, students, and families alongside exhibits. The 2019 edition of SFIDE featured a new two-day event format, delivered in collaboration with the University of Milano-Bicocca's Department of Human Sciences and Education, on the educational and professional development potential of cooperation between schools and museums. In the mornings, a panel of 12 museum representatives and 12 teachers presented and discussed educational projects that had been specifically designed to explore and leverage museum resources. The characteristics shared by these projects were inclusivity, a cross-curricular approach, joint initiatives by schools and museums, and innovative teaching-learning methods. In the afternoons, selected projects were showcased, and a workshop area was made available where museum education officers and teachers could meet, share their experience, and initiate collaboration. The aim was to explore the potential avenues of cooperation between schools and museums in an informal setting. We found that an exhibition can offer a fruitful venue for the exchange and discussion of ideas and projects among museum representatives, teachers, and a diverse range of visitors. The event brought to light a range of critical situations in which leveraging cultural heritage can meaningfully contribute to fostering lasting ties between school-going children and the places where they live.

Keywords: Museum, Cultural heritage, School, Participation, Exhibition, Milan, Italy

9.1 Introduction

This chapter presents a novel strategy for communicating and disseminating actions jointly implemented by cultural heritage sites and schools. The underlying assumption is that museums, archives, libraries, and places of culture in general can become powerful sources of connection with one's living environment (Murphy, 2016; Marini Clarelli, 2011). This is especially so when, for a variety of reasons, people's connection with the place they live has been disrupted. Indeed, it is known that cultural assets, when meaningfully engaged with, can stimulate patterns of active participation and responsibility-taking in students and teachers as well as in members of the broader community (Black, 2005). The particularly innovative aspect of the communication and action-oriented project analysed here is the fact that it was implemented in the highly informal setting of a fair-exhibition[1] and thus in an unconventional context for addressing the theme of education and cultural heritage. This novel positioning served to bring the designers of heritage education closer to its consumers. It changed the rules of engagement by allowing the beneficiaries of cultural education offerings to come up with proposals of their own, thus giving rise to new patterns of sharing and participation. The event in question was "Fa' la cosa giusta!" (Do the right thing!), an exhibition on the theme of sustainable and ethical lifestyles, now in its 16th edition, that involves thousands of people and has generated a vast network of relationships over time, elaborated in more detail below. The concept underpinning our project is that a context like a fair, similarly to a public square (Hanru, 2019), can function as a place of genuine encounter, fostering participants' desire to learn, dialogue, exchange information, create new networks, and propose action. In an era when much educational and cultural experience is technologically mediated and/or consumed without the need for any direct exchange of ideas, we are not taking a nostalgic view of the past, but rather advocate to exploit the benefits of personal engagement fully alongside those of technology. We focus on an encounter between practitioners from a range of educational and cultural contexts that took place over two days of the fair, on 8 and 9 March 2019, within the framework of the exhibition's education section, SFIDE - la scuola di tutti (Challenges - a school for everybody). In 2019, one of the key themes explored in this section of the exhibition was heritage education and museums. The authors of this chapter were curators of a cooperation process between museums, schools and the general public. It was an experiment in an approach that can fit in the field of research into informal education (Moscati, et al., 2008), following the lead of the University's Third Mission[2] and University Social Responsibility[3]. This action aimed to involve diverse communities so that a mutual exchange of practices relating to teaching and inclusion could take place. In essence, the authors set up a community of practice whose members offered mutual

1 Here we use "fair" and "exhibition" as synonymous terms that allow us to capture the dual nature of this event: a true fair centred on critical consumption and sustainable lifestyles, but also an exhibition with space for presentations, debates, workshops and collective action.

2 "Teaching is the first mission of universities, based on interaction with students; research is their second mission, in interaction mainly with the scientific or peer communities. With the Third Mission, universities come into direct contact with subjects and social groups other than the established ones and thus make themselves available to modes of interaction whose content and form are highly variable and context-dependent". Source: "qualità e impatto della produzione scientifica, relazione anvur 2013" (quality and impact of scientific production)

3 A research strand launched in the 2010s. Among the most motivated promoters is the Asean University Rector, whose website offers the USRS framework, www.aunsec.org.

support. Representatives of twelve museums, mainly located in the Lombardy region, together with twelve teachers, presented a series of educational projects to the public based on inclusiveness, interculturality, interdisciplinarity, research, and innovation. In addition to communicating and disseminating existing programmes, participants had the opportunity to explore collaboratively potential new educational projects across a range of areas. We believe that the informal setting in which these exchanges took place contributed significantly to their success. Hence, we begin our in-depth analysis of the event by examining its wider backdrop: "Fa' la cosa giusta!", which originated as an exhibition on fair trade and ethical lifestyles. The next section of the chapter traces the emergence and evolution of the fair, which - over its sixteen-year history - has increasingly extended and enriched its scope, in keeping with the feedback and suggestions received from participants. This process led to the involvement of museums and schools in the 2019 event and was informing plans for the 2020 edition.

8.2 The "Fa' la cosa giusta!" exhibition: past and future

"Fa' la cosa giusta!" is Italy's leading fair on critical consumption and sustainable living. It was launched in 2004 by the publishing house Terre di Mezzo, itself founded 25 years ago to tell the story of the Terre di Mezzo or the "in-between territories" where all people meet; where the social, beautiful and ugly dimensions of our world all come together; where fragility has become, and continues as a resource". "Fa' la cosa giusta!" was started with the aim of disseminating "good practices" and showcasing high quality examples of ethical and sustainable consumption and production, in collaboration with local government, civic associations and businesses. The fair is a place of encounter and dialogue with exponents of organic farming, critical fashion, responsible tourism, co-operation, sustainable mobility, and circular economies, namely, all those who promote a contemporary lifestyle that lays the ground for a sustainable future. It represents a responsible way of doing business, organising our purchases, conceptualising work, and using our planet's resources, while generating new connections and opportunities. In 2019, the three-day event involved over 70,000 visitors, 200 volunteers, 700 exhibitors, 450 seminars and workshops, and 3,500 students. In addition to Milan, where the national fair takes place, there are annual local events in the cities of Trento, Perugia and Palermo, and extraordinary, one-off events have been held in Turin, Genoa and Piacenza. Many new projects have originated in this "square", a public space which functions as a place of intersection and encounter. Among them were creative writing workshops for school children, events on the theme of critical fashion, and of course the "SFIDE-la scuola di tutti" section of the fair that is the particular focus of this chapter. A further key example is the "Scuola delle buone pratiche" (School of Good Practices), which was permanently introduced in 2010 with the aim of offering local administrators a place to learn and share good and innovative administrative practices. Many topics have been addressed under this umbrella including "Managing the local territory virtuously" and "Lawfulness and the public sector", which inspired a campaign against gambling that led to the collection of signatures in support of proposed legislation.

In sum, this exhibition offers a touchstone to those interested in developing an ethical style of living based on sustainability, nature, and a more humane economy that is respectful of all persons and rejects any form of exploitation. Sharing and debating possible alternative lifestyles, in a setting removed from consumerist and predatory

speculation, has generated the appropriate conditions for addressing various critical problems that have arisen over the fair's history. A notable example of this was the organisers' decision to engage in the theme of reconstruction following a series of major earthquakes, by offering a forum for joint reflection on the practices implemented by local authorities and ordinary citizens in the wake of the disaster, and the definition of

Fig.9.1 The Fair: Terre di Mezzo, 2019 (source: authors)

Fig.9.2 Sfide area in the fair Terre di Mezzo, 2019 (source: authors)

shared lines of action for the future.

In particular, in 2017 the exhibition hosted a conference entitled "Rebuilding a community in the wake of a deep wound such as an earthquake".[4] The initial questions posed to delegates were: What are the core elements required to rebuild a fragmented community? How can we identify reconstruction strategies that are future-oriented, while at the same time strengthening, reassuring, and empowering local communities? Over 120 people, including mayors, public administrators, experts, and ordinary citizens participated in a deeply moving encounter. It focused on the area of central Italy that had been devastated by earthquakes in August-October 2016, its suffering but dignified people, and the problems faced by local authorities, emergency services, and volunteers during and immediately after the natural disaster, as well as over the medium and long term. Key speakers at the event included Fabio Sbattella, head of a research unit specialising in emergency psychology and humanitarian intervention at the Catholic University of Milan. He defined the role of psychologists in emergency scenarios as fostering individual and collective well-being by activating resources that are already available within the community and may be deployed to counteract the material, economic and social damage caused by the calamity. Picking up the threads of everyday life and recovering the joy of living can be facilitated by a collective process of encounter, solidarity, narration, immersion in one's own and others' pain, and listening to others. Telling the story of the earthquake, or the flood, going over the details, venting one's anger, blaming the tragic events on injustice, fate, or chance, recalling the miracles, expressing the fear that disaster may strike once more, all that helps people to grieve, to cope with uncertainty, and to regain strength and confidence in the future.

Another interesting talk was given by Alessandro Delpriori, an art historian and mayor of Matelica (Macerata) on the topic of: "After the earthquake, recovering artistic and cultural assets in support of community identity". He described his efforts to save and restore local works of art from the area affected by the earthquake. He believes that saving churches, frescoes, decorative windows, paintings and sculptures means allowing local people to return to the places and symbols with which they identify as a community, in

4 We have chosen to highlight this initiative here, because of its close connection with the theme of this Silk Cities E-book: Prerequisites for post-disaster regeneration of historic cities 2021.

turn a key prerequisite for rebuilding their lives and futures. The mayor had launched a programme entitled "Matelica open museum". It entailed recovering damaged art heritage assets and housing them securely, not in a single large building that would be geographically distant from the local population, but in multiple buildings located close to the sites from which the artworks had been retrieved. This was to ensure that local communities would not feel as though they had been deprived of their works of art, but rather would still have them nearby. "Recovering artistic and cultural heritage means recovering the identity of a territory, of a community; it means restoring the connection between a territory and its past in order to look to its future".

Finally, Emanuele Tondi, mayor of Camporotondo di Fiastrone and Director of the Geology Dept. at the University of Camerino shared his perspective on the disaster as a local government leader and expert on earthquakes: "My university colleagues and I knew that a major earthquake was going to strike sooner or later. It was going to strike because the graph on patterns of earthquakes clearly tells us so. Destructive earthquakes hit this area about once every 350 years. We knew that the last great disaster had occurred between 1700 and 1730, so another big earthquake was bound to happen, although we hoped that it would give us a little more time to get ready, another 20-30 years. Instead it struck sooner, during my term of office as mayor". Tondi stated that to avoid the loss of human life and the collapse of buildings it would be sufficient to comply with the recommended standards for earthquake resistant construction, which unfortunately is not always the case.

Thus, at the beginning of 2017, reflection on how to reconstruct areas that have been devastated by earthquakes or other natural disasters causing radical and unpredictable change prompted a new way of interpreting and engaging with reality more generally. Hence, "Fa' la cosa giusta!" has increasingly focused on practices conducive to constructing communities of thought; proactively reinforcing the social fabric of our communities (without passively waiting for adverse events to strike) in a way that is respectful of nature, our planet, and humankind; and seeking to establish forms of economic and cultural production that do not involve exploitation but foster sustainable development, peace, and diversity.

8.3 Where the idea came from

A key means by which "Fa' la cosa giusta!" has sought to foster the emergence of communities whose practices value their local area and heritage is the inclusion of museums and cultural heritage assets more broadly in the education section of the exhibition from 2019. Following the first edition of SFIDE in 2018, a group of teachers who had been involved in organising it, proposed to introduce the theme of cultural heritage and museums in the subsequent exhibitions. Indeed, schools had contact with museums traditionally, although in the past this contact was usually confined to one-off field trips that were not necessarily integrated into a broader teaching-learning strategy. Nonetheless, in recent years, numerous museums have begun developing innovative educational programmes and educational experimentation has become a key part of their mission (Zuccoli, 2014). Hence, the SFIDE teachers felt that including museums in the exhibition would facilitate the transfer of innovative practices, as well as encourage schools to engage with local heritage and initiate new forms of collaboration with cultural heritage sites. Sharing this view, Piero Magri and the exhibition organisers invited the University of Milan Bicocca, which had been active in this field for some time, to join the project. The team met with representatives of the various museum networks located in the Lombardy area to define how to structure the event and what institutions to involve in it.

The idea – underpinned by the concept of favouring active participation in the fair or in the public debate, as discussed above – was to invite the participation of small museums scattered across the region[5], each with their own specific cultural heritage assets, which had received little publicity before, due to their small size, and were therefore relatively little known. These museums were often located in places in need of cultural revival and a process of re-appropriation of cultural heritage by the local community. Together with the Lombardy Region, the body responsible for attributing cultural heritage sites with museum status, the organisers decided to ask each of the interested museums to present one of their existing educational projects, which was required to have been co-designed with a team of school teachers. This project was to be adaptable to students at all levels of schooling, be multidisciplinarity, in the sense of being relevant to more than one school subject and based on innovative teaching-learning methods that would facilitate the inclusion of pupils from different cultural backgrounds. The participating cultural spaces had not been damaged by a natural disaster, but many were located at peripheral sites or difficult to access and thus at risk of being overlooked or forgotten. These heritage sites were investing in strategic alliances with schools, given that schools are among the places where children can potentially be introduced to active cultural education that is respectful of all cultures and abilities and provides opportunities for learning to engage in active and ethical citizenship practices. Nourishing children's and youths' knowledge of their local area, as well as nurturing their desire to take care of it, and in the future to conserve its heritage and communicate it to others, is indispensable to ensure the long-term survival of museums and the cultural assets deposited in them. It is a crucial step, if we expect the younger generations – understood as interpreters rather than merely as consumers of culture – to take responsibility for these heritage sites in the future.

The following museums applied successfully to take part in the SFIDE event: Archaeological Museum of Val Sabbia, Gavardo (BS); GAMeC Bergamo; Civic Museums Casalmaggiore (CR); MUST, Museum of the Vimercate area; Villa Lonati, City of Milan; Civic Collections of Art of Palazzo Maliani Cicogna, Busto Arsizio; MA*GA of Gallarate; Museum of Stories, Bergamo; MUSIL Museum of Industry and Labour of Brescia; Peoples and Culture Museum - PIME, Milan; Palazzo Reale, Milan; Villa Carlotta Museum, Lake Como. Each of these museums presented a project that it had jointly developed with schools, which had been implemented on site at the museum, and in some cases also in schools themselves or at other locations in the community. All projects had involved members of the public as well as school students. The strengths of the various projects included: listening to and valuing the students' voices, inclusion, interdisciplinarity, and the elaboration of concepts such as heritage, memory, future, citizenship, conservation, and participation. Sharing these projects in the context of a fair, a "square" - a public space, facilitated the exchange of good practices and made it easier for participants and visitors to view these practices as potentially transferable and adaptable to other settings.

8.4 Reconnecting (younger) citizens with heritage

The entire process was characterised by a high level of civic participation, from the initial preparatory phase to the two-day event itself. The question that continued to ring in the ears of the organising team over its months of work was one that English-speaking scholars – and especially James Cuno - have been reflecting on for years. Who owns cultural heritage? Or more precisely, who is responsible for taking care of it? Once again, we found that the answer was the community. It therefore came naturally to us to adopt collaborative research methods (Beauchesne, et al., 2005; Desgagné, 1997; Desgagné, et

5 Museums in the city of Milan were also eligible to take part.

al., 2001; Lenoir, 2012), which saw researchers, museum staff, educators and teachers working together as equal partners.

In keeping with the University of Milano-Bicocca's ethical and socially responsible commitment to its Third Mission (i.e., community engagement, alongside the traditional missions of research and education), the researchers worked with – as opposed to about – educators and teachers, at round-table sessions that were informal in style despite taking place in institutional settings. Importantly, these meetings facilitated the identification of problem issues and solutions with the input of the participating local administrators. Furthermore, the sharing of information and discussion that took place at these sessions produced the final set of short presentations to be showcased at SFIDE. Notably, it was decided to focus the presentations on two main areas: work experience projects (alternanza scuola-lavoro) and involving members of the community in the passing on of knowledge. More generally, these encounters met the need of museum education officers to engage in informal exchanges of ideas with teachers and researchers. Overall, they prompted broader reflection, long called for by the research community in the field of cultural heritage education and on the relationship between schools and museums. Other valuable outcomes included the joint identification of solutions to problems that were common to different projects and settings and the fact that the dynamic space offered by the fair-exhibition facilitated the use of different languages, methods and approaches according to their contexts. The conference setting fostered two-way dialogues between teachers and museum education officers, and the exhibition setting provided opportunities for the museums to illustrate their educational offerings to different groups of visitors who were able to experience these offerings directly. Moreover, new networks and projects took shape and, above all, museums and schools were able to work collaboratively on the design of new joint projects.

Fig.9.3 One exhibit made by Educational department of Villa Carlotta. (source: Alessandra De Nicola, 2019)

Finally, when conference delegates interacted with the members of the discussion panel a further theme of debate emerged: the relationship between museum practices and school practices. Drawing on their existing repertoire of experiences, teachers, educators, and practitioners worked collaboratively to raise novel perspectives. Key among them was "assessment is crucial". The introduction of work experience (alternanza scuola lavoro) for secondary school students offers students an extraordinary means of emancipation, especially for those who normally find it more difficult to affirm themselves during everyday school activities. However, work experience, like the other activities that are conducted within the museum framework, should be carefully evaluated, so that they can be attributed an appropriate weight within the students' overall educational path. Museums provide opportunities to bypass the formal aspects of education. They represent a new space; a place in which education can be delivered in a free but protected environment. These were the voices of some of the participants. Their contributions defined new challenges for the future. How should heritage education programmes offered by museums be evaluated? What is the place of museum projects within school programmes? How can cultural heritage projects produce a significant impact in terms of inclusion?

The value of the SFIDE event was confirmed by the participating museum education staff, who particularly appreciated the opportunity to share and explore in an informal setting the positive practices and projects that were the outcome of many years' work in isolation in small, local settings. The event drew on a set of existing projects, informally illustrated as case studies, in which two educational agencies (a school and a museum) had formed an alliance, studied the needs of their respective communities. and jointly designed responses to those needs. The collaborative exchanges moderated by the authors of this chapter, with the support of the regional institutions, fostered the creation of a new community and the generation of a new, shared vision of cultural heritage.

8.5 Conclusions

In this chapter, we set out to describe and contextualise Fa' la cosa giusta!'s initiatives on the theme of education - schools and their relationship with cultural heritage - museums, libraries and archives. Over the last years, the organisers of the exhibition, together with the teachers in charge of curating the education section and a team of researchers from the University of Milano Bicocca, chose to focus specifically on small and often under-valued museums in Milan and the surrounding region. It is important to recognise the valuable educational work undertaken by many museums in recent decades, as borne out by the significant increase in their educational offerings, which have often featured new modes of access to cultural heritage via active learning, innovative methodologies, and continuous collaboration with teachers and students at partnering schools. The general consensus is that cultural heritage is "common property", which should be accessible to all so as to involve as many people as possible in consuming, communicating, studying and conserving it. More specifically, in areas affected by high levels of school drop-outs and unemployment, together with a mix of cultural groups that do not readily interact with one another, making cultural heritage available to each and every person represents a key investment in the future.

The diverse range of positive experiences and voices shared at the Fa' la cosa giusta! / SFIDE event suggests that having schools engage with the cultural assets present in their communities and encouraging museums to revisit their collections and offerings in a way that values the stories of all their beneficiaries can be key steps towards enhancing community participation in our shared cultural heritage. An interesting aspect of the event was the diverse range of subject areas covered by the participating museums,

a feature which encouraged teachers to get involved.

Whether science, art, history, or ethnographic museums, to mention only some of the categories represented, all of them offered students the opportunity to engage directly with cultural objects and to take part in educational experiences that cannot take place at school. Visiting a different learning environment from that of their school is in itself a meaningful educational experience for students. It helps them to take ownership of their local area more consciously. During the SFIDE event, the fair became an ideal space for different subjects to meet, a place without barriers where all questions and proposals were allowed and where those who work in schools and museums were stimulated by new networking opportunities. The environment of the fair, with such diverse players present, is the ideal place for the informal exchange of stories, heritages and best practice. Sharing experiences with a wide audience, allowed for a broader debate and reflection across diverse disciplines. It has triggered processes of innovation in teaching, starting with a gaze on the search for more sustainable methodologies. The challenge for the future is to expand the debate, to increasingly bring museums and cultural heritage into public squares, streets, and fairs, so as to eliminate traditional barriers and restore and constantly nourish the connection between the community and its cultural assets. The underlying principle is that we do not need to wait for a disaster to happen to cultivate a new way of looking at our cultural heritage. Rather, we should seek through our everyday actions and practices to foster a renewed appreciation of culture, especially local cultural assets, which schools should leverage to the full in their educational programmes. In sum, forging bonds with our shared culture, and developing inclusive and innovative learning strategies and methods based on material and immaterial cultural objects, are set to become a crucial new frontier in heritage education for the future.

Fig.9.4 Practitioners, curators, educators, teachers, students, participating to discussion. (source: authors)

References

Beauchesne, A., Garant, C. et Dumoulin, M.-J., 2005. Le rôle de cochercheur chez lepartenaire du milieu scolaire dans les recherches collaboratives. *Revue des Sciences de L'éducation* 31(2), 377–395.

Bishop, C., 2006. *Participation.* London: Whitechapel Gallery.

Black, G., 2005. *The Engaging museum. Developing Museum for Visitor Involvement.* London-New York: Routledge.

Cuno J., (ed.) 2004. *Whose Muse? Art Museums and the Public Trust.* Princeton: Princeton University Press.

Desgagné, S., 1997. Le concept de recherche collaborative: l'idée d'un rapprochement entre chercheurs universitaires et praticiens enseignants. *Revue des sciences de l'éducation* 23 (2), 371–393.

Desgagné, S., Bednarz, N., Lebuis, P., Poirier L., and Couture, C., 2001. L'approche collaborative de recherche en éducation: un rapport nouveau à établir entre recherche et formation. *Revue des sciences de l'éducation* vol. 27, n° 1, 2001, p. 33-64

Didi Huberman, G., 2009. L'immagine brucia. In: A. Pinotti, A. Somaini: *Teoria dell'immagine. Il dibattito contemporaneo.* Milano: Cortina (ed. or. 2006), 241-268.

Gadamer, H. G., 2000. *Verità e metodo.* Milano: Bompiani (ed. or. 1960).

Hanru, H., (ed.) 2019. *La strada dove si crea il mondo. The street where the world is made.* Macerata: Quodlibet.

Lenoir, Y., 2012. La recherche collaborative entre recherche-action et recherche partenariale : spécificités et implications pour la recherche en éducation. *Travail et apprentissages* 9, 14–40.

Lyet, P., 2014. Recherches participatives ou recherches actions collaboratives. In Paturel D. (ed.) *Recherche en travail social, les approches participatives.* Nîmes: Champ Social Editions, 198–217

Marini Clarelli, M. V. 2011. *Il museo nel mondo contemporaneo. La teoria e la prassi.* Roma: Carocci.

Moscati R., Nigris E., Tramma S., 2008. Dentro e fuori la scuola. Milano: Mondadori.

Murphy, B. L., 2016. *Museums, ethics and cultural heritage.* New York: Routledge.

Zuccoli, F., 2014. *Didattica tra museo e scuola. Antiche e nuove forme del sapere.* Parma: Ed Junior-Spaggiari.

Silk Cities

Beauty revealed in Pakistan and Italy

How younger citizens remove the veils that hide cultural heritage

Alessandra De Nicola, University of Milano Bicocca, Italy alessandra.denicola@unimib.it
Department of Human Sciences and Education, BiPAC -Interdepartmental Research Centre of Bicocca for Cultural and Artistic Heritage

Marvi Mazhar, Goldsmith University of London, info@marvimazhar.com
Pakistan Chowk Community Centre (PCCC), Pakistan

Abstract

Drawing on a common sensibility that transcends local circumstances, we examine how similar solutions have been identified for problems with different root causes and arising in highly diverse settings in two different continents. The solutions presented share an educational approach based on offering sensory experience and encouraging communities to participate in the educational process. In the Pakistani example, this approach was proposed by a group of artists, while in the Italian one it was developed by researchers through their participation in and analysis of art projects.

Keywords: Heritage, Education, Civic engagement, Heritage activism, Karachi, Pakistan, Lake Como, Italy

10.1 Introduction

The theme of this chapter is heritage education as a tool for rethinking and re-appropriating our cities and local areas. Its point of departure is a shared perspective informing different approaches, from which it is hoped to develop a new project. If we think about the Universal Heritage declaration, we could assume here that it would be likely for us to be able to identify a single, universal definition of cultural heritage. A single definition would cover many types of heritage and identities while attempting to reflect the infinite nuances of the topic. If we were to conduct such an exercise of synthesis at the international level, this would provide us with common ground for reflection, made up of languages and sensibilities that can dialogue with each other, despite the numerous possible interpretations.

This is of utmost importance for present-day cities. Karachi, for example, with its multiple religions, sects and economic divisions and increasing stratification, has restricted the emergence of social sciences, art, literature, and cultural activities to a certain spatial demographic. As the city expands horizontally, wealth becomes concentrated in specific districts, to the detriment of others. The strong symbolic segregation that has come to be associated with space in the city has given rise to a mindset amongst the inhabitants of the city which is reflected in discourses of exclusion centring around "the purana shehr" (old town) vs. the "naya shehr" (new town)", a categorisation that resonates with the orientalist notion of the 'us versus them' divide. This symbolic divide legitimises the lack of communication that exists between different demographic groups in the city and uninformed citizens remain oblivious of what exists outside their own demographic circles. (Mehrotra and Narain Lambah, 2004). This kind of situation, where concrete or symbolic barriers undermine the quality of life in a given territory, occur also in Italy and in the West generally. In the light of this background, our aim here is to initiate a fruitful relationship for research and practice between cultural heritage initiatives in the two nations of Italy and Pakistan. Naturally, the cultural heritage sites examined differ in terms of their form and function and therefore in terms of how they may best be used, protected, and promoted. They present different problems, to which however similar answers have been proposed, prompting this joint reflection, and the quest to exchange methodologies and approaches. Like in an ideal community where the same language is spoken, a shared lexicon enables us to mutually enrich our perspectives via the recognition and embracing of our differences (Jalla, 2016). The primary challenge in both countries is to find ways of reconnecting citizens, in particular the young, with heritage, attempting to lift some of the veils that all too frequently conceal landscape heritage assets, such as habit, a lack of knowledge, prejudice or a sense of inadequacy (De Nicola and Zuccoli, 2016). This may be achieved by conducting Heritage Awareness Programmes and Heritage Walks with youth and later getting young people to lead these activities themselves. When describing how this has been done to date in the Pakistani and Italian cases, we will seek to define tools for identifying people's "horizon of identity", that is to say, the cultural landscape within which their lives are situated. One such tool, by way of example, is collecting narratives from locals and other users of a given cultural space. We specifically focus on the heritage education programme implemented by the Pakistan Chowk Community Centre in Karachi. The goals of this "Walking Heritage into Future Cities" is to enhance awareness, share knowledge, generate income, and encourage community engagement following the model developed by Heritage Walk Calcutta (HWC) and Heritage Walk Karachi (HWK) for the conservation of heritage. A key aspect of the programme is the involvement of children as heritage activists.

10.2 The quest for a common "lexicon": persons, objects, landscapes

A different project was a scheme to entirely abolish all words whatsoever. This was considered as a great advantage regarding health, as well as brevity. It is obvious that every word we speak is, to some degree, a diminution of our lungs by corrosion and, consequently, contributes to the shortening of our lives. Therefore, an expedient was offered, "…that since words are only names for things, it would be more convenient for all men to carry about them such things as were necessary to express a particular business they are to discourse on…" (Swift J., Gulliver's Travels, III.5, p.21).

Fig.10.1 Children during heritage education activities with their drawings. The caption was "heritage activists!" on the PCCC Instagram profile (source: PCCC, 2019)

This chapter originated with a picture of a child found on a website, which prompted the Italian author to seek out, contact and initiate a process of exchange with her Pakistani counterpart. Crucially, the former conducts her research in the field of visual culture, which is partly based on the study of images. The photo that sparked her interest featured a group of children displaying their drawings, outdoors somewhere in what appeared to be an Eastern setting. There were two main points of interests:

1. The drawings represented buildings in a city.
2. The caption chosen by the authors was: "heritage activists!".

In the field of art and heritage education research, images and in particular drawings can offer a key tool for community learning and participation in local life and heritage (De Nicola and Zuccoli, 2019). In particular, the use of drawing is a stimulating way to rethink spaces with multiple objectives in mind. From a design perspective, this domain is not the exclusive concern of designers or architects, it could also be a part of a teacher's activities, if we view space as "the third educator"; as part of a creative or autobiographical narrative; as a means of learning about territories before and without the use of words. In the words of John Berger, "in the teaching of drawing […], the heart of the matter lies in the specific process of looking" (2005, p.11). Our aim was to educate audiences' gaze, attempting to overcome the barriers that prevent them from enjoying

and appreciating the value of everyday places, especially those in their own local area. We soon realised that the Italian and Pakistani partners were pursuing this goal from identical perspectives. Berger's useful definition, "drawing is discovery" is not just a phrase, it is quite literally true. It is the actual act of drawing itself that forces the artist to look at the object in front of him, to dissect it in his mind's eye and put it together again" (ibid., p.11.). The act of drawing therefore becomes a way of looking with fresh, different eyes at the places where we live, enabling us to pull aside the veil of habit that normally obscures our local heritage. The beauty that is thereby revealed is not so much a question of aesthetic experience but rather one of recognising the meaning of a place. Thus, we did not choose "Beauty Revealed" as the title of this work with a view to discussing beauty in the absolute sense, but rather to invite reflection on lost horizons of meaning. This is an issue shared by many contemporary landscapes, whether due to destruction wrought by earthquakes, human neglect, successive layers of urbanisation that have obscured their memory, or the fact that we have lost the habit of contemplating the places we live in mindfully. Indeed, people's tendency to be more aware of landscapes when they are on vacation than in the course of their everyday lives is a widely-studied phenomenon (D'Angelo, 2014). In the case studies that we describe here, "Heidegger's concept of *wohnen*, or living, in the sense of dwelling which underscores stable ties rooted in tradition, became a core category in a sense of landscape that, it was thought, would avoid the excessive emphasis on aesthetics of those who do not truly inhabit landscapes but rather view them as spaces of leisure and contemplation" (ibid., p. 76). Without addressing what Martin Pollack (2016) has termed "contaminated landscapes" - that is to say, those landscapes across the globe whose memory has been deliberately obscured to conceal the massacres and mass killings perpetrated in them - we set out to discuss landscapes that host cultural heritage assets whose value and meaning are lost to the local communities inhabiting them. However, to that effect we needed to identify a shared lexicon that did not require a precise definition of the heritage assets themselves. This would have been a demanding exercise and not of particular value to our avenue of inquiry in this chapter. Hence the citation from Gulliver's Travels at the beginning of this section. We radically simplified the task before us by identifying the shared object of our work as cultural heritage assets which, as numerous legislative frameworks stipulate, are first and foremost things[1].

From the perspective of visual studies, which explore the relationship between how individuals define each object that they see and that which is visible, interpreting[2] heritage assets as objects means viewing them as a direct source of knowledge that is unmediated by any filter or barrier to access. To put this more simply, the visual process relies on a decoding of images that is informed by our prior experience and knowledge. For the purposes of the current study, one of the most salient aspects of visual studies is that "They particularly concern themselves with intersubjective phenomena [and] the dynamics of seeing and being seen by others as constitutive of the social sphere" (Mitchell, 2018, p.21). According to Mirzoeff "For most people, seeing the world still means first and foremost seeing our own city: taken together today's global cities make a world of their own. p.107). The new global city extends beyond the older concept of city limits (p.108). [...] Seeing in the global city requires active self-censorship from its residents as part of a highly controlled environment (Mirzoeff, 2017, p.109)". The goal of the work carried out at the Pakistan Chowk Community Centre and on Lake Como in Italy is to provide audiences with tools of learning to appreciate the value of the place where they

1 We do not discuss immaterial assets in this chapter, although we refer in passing to the role of oral narratives as a means of enhancing appreciation of cultural heritage.
2 Here the term "interpretation" is underpinned by the field of research launched by Freeman Tilden in 1957 with his seminal work "Interpreting our heritage" and significantly enriched from an educational perspective by the work of Eilean Hooper Greenhill.

live, and to overcome this sense of self-censorship (Zuccoli, De Nicola 2018). Because "...seeing is not believing, is something we do, a kind of performance [...] the key places [...] are the global cities, where most of us now live. In these immense dense spaces, we learn how to see - and also not to see - potentially disturbing sights - as a condition for daily survival" (Mirzoeff, 2017, p.15). The aim of the work described in this chapter is to help communities attain not just survival in the everyday life, but rather a good quality of life. We set out to invert the paradigm that has conventionally been brought to bear on approaches to cultural heritage by taking people, the local community, as our point of departure, and inviting them to construct contemporary landscapes - the stage on which they perform their lives - through their gaze, a stage that comprehends the objects and heritage assets making up individual identity. This research is intended to lay the ground for planning future dialogue and the concrete exchange of practices and knowledge on this approach.

10.3 PCCC- Pakistan Chowk Community Centre and its projects

Pakistan Chowk is a landmark heritage site in Karachi's South District and is located in the middle of the Old Town. The Chowk has historically been the central point of the city where there used to be a weekly fish market. Slowly with time as institutes and educational hubs started opening, the chowk converted into a literary space, where people assembled to have conversations about literature, mainly in the form of mushairas[3] {poetic symposia), baithaks[4] (talking circle) and similar. Over time, the horizontal expansion of the city and the horizontal concentration of wealth gave rise to a process of social exclusion that damaged the existing social framework. Disparity of class and infrastructure turned public spaces into vulnerable places which were classified as wasted space. The vision of intervening at the Pakistan Chowk was to restore art and culture for the immediate neighbourhood, and not allow it to remain neglected like in the past. In Phase 01 of this initiative, we remodelled a 6,633 sq. ft. space in the Pakistan Chowk by installing benches, lamp posts, trees, dustbins and conducting a mass cleaning of an area that had previously been a dark public space because of governance neglect, and decay. Following the successful completion of Phase 01, the Chowk got gradually occupied by women and children, artists and thinkers of the neighbourhood. As one of Pakistan Chowk Initiative groups, we started documenting the process and started curating outdoor activities. This formed a close relation with the neighbourhood and its immediate context.

As time passed by, this led to the emergence of multiple sensitive topics for dialogue and conversations that required a more intimate place. Consequently, we began to envision a space for hosting art and cultural activities that were not feasible to conduct in the open-air setting and needed more proximity and longer vision towards creating cultural nexus. That is when the Pakistan Chowk Community Centre was born. This was a two-room space housed on the first floor of the historic pre-partition Sultani Mahal Building in Karachi's Old Town. It is located approximately 30 feet from Pakistan Chowk and faces the Saranagati Building. Our goal with this community centre is to bring the residents of the Old Town together by offering them a space that can be utilised for exhibitions, book launches, baithaks, town hall meetings, as well as a space that facilitates research and inquiry. The project is unique in its way and has no reference for a prototype. Since it's the first of its kind, it developed its programme with an experimental approach. The

3 A poetic symposium is part of the Culture of North India, Pakistan and the Deccan, particularly among the Hyderabadi Muslims, and is regarded as a forum for free self-expression.

4 The talking circle is a sort of sitting/lounge room with an informal setting where all kinds of people can come together over a cup of tea to discuss the day's events including social, domestic, economic and political issues. The goal of the Talking Circle is to create a space where people come together and talk about issues that plague their immediate environment and start movements as a result of them.

curation of the programmes was subjected to the demands of the neighbourhood and some initiatives were introduced by the PCCC group of the advisory committee as part of outreach programmes, and to strengthen the cultural nexus. The Pakistan Chowk Community Centre Projects used different methodologies to develop a relationship with the neighbourhood. The first one was to intervene at grassroot level by engaging with the community through various interactive programmes like open mic conversations, qawwali and sufi music nights, theatre and art shows. engaging with children through storytelling and drawings and then exhibiting the work in the streets of the old town on shop fronts and walls as part of an informal art exhibition. The second part of PCCC was to have an in house research and documentation lab. This approach gave us intimate access to get to know the regional old town context more sensitively and intimately. We used the following tools for our analysis. We started collecting oral stories, personal archives and photographs and we did street photo mapping recording living heritage. These methods helped us in collecting neighbourhood information on the historical past, dilapidated conditions, politics, bureaucracy of real estate developers and the possible decay of the old-town future.

The aim of the projects was to develop advocacy and give voice. Our three projects -Old Town Mapping, Spoken History and Heritage Walk Karachi - are interlinked research projects. They helped us create a platform for young researchers from various institutes to take part and help us analyse the tangible data and turn it into social research hypotheses. This information is absolutely critical for creating a narrative towards projects for the future preservation of the old town. People's voice was the most powerful tool and witnessing deterioration through visual collection every day helped us support our recording.

10.3.2 Project 01: Old Town Mapping "Sarak Chaap"

The Old Town Mapping Project is an informal indigenous way of mapping, where documentation is done by walking the streets and photographing the built environment in various ways -indoors and outdoors. We were focusing on special architectural details to understand the importance of each structure and its relation to the street, as well on exploring the social and political intricacies of the area. This format creates an archive of the various heritage sites in the Old Town of Karachi, as well as of the changes that have been made to them over time. This project aims to map the different communities in the Old Town, their environment and cultural heritage assets that could be conserved and documented. To that effect, we adopted different categories, such as sacred spaces, famous landmarks, gastronomy, public nodes etc.

10.3.3 Project 02: Spoken History Project "Ghair Sarkari Tareekh"

The Spoken History Project gathers storytellers and records information that is salient to mapping the vestiges of the space that was, and the space that is now. Informally entitled "Ghair Sarkari Tareekh" (non-government history), it emphasises the validity and legitimacy of memory and oral tradition. It begins with an interview, but spontaneously continues as an anecdotal charting of space. We seek to both preserve and re-activate memories and memorabilia of the Old Town, by simultaneously archiving and exhibiting them. Our story tellers are residents, labourers, loiterers, and all citizens associated with the neighbourhood. Their contributions help us analyse local spatial needs and trace the evolution of the community and its culture. These stories are from everyday which generate discourse amongst the users and residents of the old town.

Fig.10.2 Storyteller privileged witnesses to record information that is salient to mapping the vestiges (source: PCCC, 2019)

10.3.4 Project 03: Heritage Walk Karachi

This project is the conclusion of "Oldtown Mapping and Spoken History". This project is also what makes the research sustainable, and earns small fees in order to continue developing mechanisms towards policies focusing on living heritage. The guided tour is a platform for activism bringing institutes, civil society, and students, writers, journalists to witness the decay the Old town faces every day. Collecting stories is an important part of the tour and makes it relatable and grounded. The aim of this project is to promote the engagement of people from all over the city with the Old Town area, and enable them to explore its historical treasures, beyond the narrow category of pictures. It includes workshops and field trips for students, as well as guided tours during which participants have the opportunity to explore previously unfamiliar alleyways, streets, buildings, structures and spaces within Karachi's Old Town.

10.3.5 Heritage Awareness Programme developing heritage activists

The Pakistan Chowk Community Centre has successfully organised about 100 events over 30 months. These events include numerous activities for children such as music workshops, origami classes, clay art workshops, sketching classes, storytelling sessions

etc. The Pakistan Chowk Community Centre provides a platform for kids of all ages to showcase and explore their talent by participating in, and organising multi-dimensional activities. The basic purpose of involving children in such activities is to enhance their understanding of art in its different forms and its role in our culture. The Pakistan Chowk Community Centre initiated the process of enhancing heritage awareness among children by organising talks and workshops in different schools and also by introducing a Heritage Society as a part of co-curricular activities in schools. These initiatives come under the Heritage Awareness Programme- (HAP project). HAP creatively fosters critical thinking and the free expression of emotion based on a newly acquired understanding of the existing historic built environment and its importance. Architecture is everywhere but nobody teaches us how to understand and enjoy the city and all its complexity. We believe that teaching students from primary school through to higher education how to observe, understand and enjoy the built environment will open up their minds to a more creative way of thinking and prepare them to play an active role as the citizens of a sustainable future. The programme is designed for implementation with public and private schools and universities. HAP also involves conducting Heritage Tours and Training. The Pakistan Chowk Community Centre has successfully delivered numerous HAP sessions at schools all around the city and PCCC's Heritage Walk Karachi Project has been co-opted by the Heritage Society in a number of schools to conduct talks, workshops, and walking heritage tours in the Old Town of Karachi. The PCCC has also successfully run a HAP kiosk named "Developing Little Heritage Activists" at a family carnival, where kids could play a number of heritage education games and print their own heritage tote bags.

10.4 A western point of view: an overview on a theoretical framework of an outdoor education - a long tradition

Since the time of the ancient Greeks, and the school founded by Aristotle, walking has been seen as functional to the development of critical thinking and to philosophical speculation. This was the era of the Peripatetics or walking philosophers. However, it was only with the writings of Jean Jacques Rousseau that walking became a cultural, and in parallel, an educational activity. Indeed, in his "Confessions" the French philosopher declared that he could "meditate only when I am walking. When I stop, I cease to think; my mind only works with my legs" (Rousseau, 1976, p.426). In "Emile, Or Treatise on Education" he both discussed walking as an educational act in itself and laid down the foundations for what has come to be known as empirical education, or educational processes that draw on sensory experience. The next significant developments concerning the theme of walking did not occur until the twentieth century. The 1900s saw numerous educationalists theorise the value of teaching methods that involve leaving the classroom setting and benefitting from the educational potential afforded by the local area and its cultural heritage assets. They include the activist John Dewey, the Italian Giuseppina Pizzigoni who theorised the educational value of school gardens and of field trips in the neighbourhood of the school, the Agazzi sisters who invited their pupils to bring to school objects found during exploratory walks, and Loris Malaguzzi and his concept of space as the "third educator", that is to say as a core aspect of all educational design. Outdoor education has thus become one of the contemporary methods of active teaching and learning. This has gone hand in hand with an increase in the opportunities for children and youths to have educational experiences allowing them to become agents of responsible social change (activists). Two historical international examples of this are the Scout movement and the youth branch of the Red Cross and the Red Crescent. Alongside these instances of an educational model that combines peer education with the moral and ethical values of international humanitarian law,

many local projects have sprung up with the aim to encourage children and families to change their lifestyles, especially for environmental reasons. Examples are the Massa Marmocchi (an offshoot of the Critical Mass movement) which promotes the conscious choice of cycling to reduce motor traffic volumes, or the many "walking bus" campaigns organised to get groups of children traveling to school on foot. A final example would be the emergence of youth councils that accompany democratic institutions.

These were the theoretical and practical underpinnings of the student work placement programme conducted at Lake Como's Museo del Paesaggio [Landscape Museum]. There are two main differences between the Karachi initiatives outlined above and this project. First, the Italian programme was implemented in a local area setting, Lake Como, that bears all the classic attributes of a landscape. Second, while the work experience officially took place within the institutional framework of schools, the participating youths followed the programme independently, without their teachers' supervision, during their 2019 summer break, and were awarded academic credits as a result. What the two initiatives have in common is the need to educate young people's gaze so that they can grasp the value and meaning of the places where they live, given that everyday habits often work to obscure the symbols that denote a community's specific identity. This quest for a community, as an expression of the local area with the capacity to offer children and youths unmediated insights into the value of the place where they live is the main point of contact between the Lake Como and Karachi programmes. The surprising thing is that the Italian students spontaneously undertook the same activities described in relation to the Pakistani initiative. Both felt the need to map the territory; they conducted their explorations independently, despite having received specialised guidance in relation to the contents; and they sought out direct sources of knowledge, identifying privileged informants to interview.

10.4.1 Grand Tour 2.0 of Tremezzina (Como): An Italian initiative

Target

The participants were 16 youths under the age of 18 years attending two secondary schools with three different curricula. Four students were from the Leonardo da Vinci Technical Institute in Carate Brianza who were assigned the task of producing the videos; three students took the languages curriculum at Liceo Teresa Ciceri, an academic-track secondary school; and the remainder were enrolled on the human sciences curriculum at the Liceo (Ciceri (Fig.10.3).

Objectives

The key objectives of this action project were getting the students to:

a) enter into an equal dialogue with the cultural heritage sites in their local area;

b) prepare for their future occupations by learning about the problems affecting the appreciation of cultural heritage;

c) experiment with and learn the workings of developing instruments for interpreting cultural heritage, especially landscapes;

d) engage in group work and learn to complete tasks to deadline;

e) produce materials for presenting their work placement activities to the public;

f) speak in public, clearly communicating their experience;

g) organise and lead guided visits;

h) reflect on the museum's current contents and suggest potential new contents;

i) learn how to design and conduct an interview;

j) begin to engage with autobiographic and ethnographic methods of heritage research;

k) find out how to disseminate the new products that emerged from the work placement activities.

Themes and planning

Following a proposed method that was loosely informed by Paulo Freire's "Pedagogy of the Oppressed", especially in terms of problematising learning contents and offering opportunities for equal dialogue in educational action, the students divided themselves into four groups with a view to researching four themes they chose by themselves, albeit with supervision:

a) the landscape as seen by children;

b) the landscape as seen by locals;

c) the landscape as seen by newcomers to the area;

d) the landscape during the Festival of San Giovanni fireworks display.

Each group identified four tasks to be carried out, in keeping with the theoretical input received during an earlier phase of the work placement: shooting a video, communications, interview, and "backstage" coordination.

The products

- Journals, whose completion facilitated the inquiry process and helped the students to develop their self-narrative abilities.

- Metacognitive sheets, a cooperative learning tool that gave the students the opportunity to actively participate in the educational process by observing its strengths and weaknesses. More specifically, the participants were invited to express themselves using their preferred language, in that they could choose between drawing and responding in writing or orally to a set of questions designed ad hoc to invite the problematisation of the educational activities and elicit active suggestions for their improvement.

- Video-recorded interviews, kits, and materials underpinning an informal educational activity designed by Group a). Interestingly, the development of these products was informed by inputs received during the preliminary training phase of the work placement. The students used them as the basis for interviews they conducted with 4-to-7-year-old children attending a summer camp.

- Photographs, narrative accounts, sounds, and images collected by Group b), who even succeeded in recruiting the input of musician and storyteller Davide Van De Sfroos. We do not single out this informant on account of his celebrity status, but rather due to the large volume of material that he voluntarily and skilfully shared with the students.

- Posters designed by Group d) targeting the public attending the San Giovanni Festival fireworks display.

- Photos documenting the behind-the-scenes activities.

- A project logo designed and produced by the students, initially used as the Instagram profile picture.

- A poster advertising the final event, again designed and produced by the students themselves.

Fig.10.3 Youths exploring, interviewing, researching. They are using their preferred tools (drawings, video, photo storytelling), learned during the project, to interpret their heritage (source: Alessandra De Nicola, 2019)

The key outcome of the work placement was not so much the materials produced, which indeed were sometimes naive and unpolished, but rather the value of an educational process that elicited serious and mindful engagement from 90% of the students (only three of the sixteen participants displayed a low level of commitment to the project). The weak point of the project was the fact that it was conducted during the summer break. While the students proved themselves to be highly committed by willingly giving up portions of their holiday time to work on the project on the one hand, greater continuity would have been obtained by implementing the project during the school year on the other hand. Another issue being examined by the researchers is how best to assess educational experiences, from the perspective of the participating schools, that take place in extra-curricular settings.

The project's strong points include the fruitful encounter between different subject areas and fields of knowledge, thanks to the fact that the participants were studying a diverse range of curricula. For the first time, these students had the opportunity to grasp the value of their own course of studies, based on exchanges with peers. They all undoubtedly had the chance to engage with their own landscape in a personal and authentic manner, which they tended not to perceive as a cultural heritage asset – previously only being aware of the generic need to take care of the environment. They came to understand the value and enormous potential of the landscape museum, which had been unknown to them. Based on these outcomes, they were assigned the further task of engaging in and sharing their discoveries with other audiences, an exercise the students variously defined as "interesting", frustrating, or even transformational.

Fig.10.4 Some installations designed by teenagers to tell the story of their landscape in the Lake Como Landscape Museum (source: P. Berera, 2019)

10.5 Conclusions

The two case studies we have briefly presented here feature very different geographical areas, cultures and landscapes. Yet they also share a similar need, initially identified in the fields of art and culture, to help communities find, or rediscover the identifying marks of the places where they live, by developing their capacity to produce narratives about them themselves. The reported initiatives also show that heritage education can be based on the exploration of places. Both case studies offered educational experiences with a major sensory component, albeit via different formats. In both countries, the entire process was underpinned by dynamic observation, in extra-curricular settings, based on drawing. Let us consider the argument - advanced by South African artist William Kentridge (2014) in the first of his "Six Drawing Lessons"- that "seeing is the metaphor through which we comprehend the world" to put this approach into context.

Kentridge understands the act of seeing to be the involuntary suspension of incredulousness. He clarifies this concept further by placing scraps of black paper on a white sheet and then to declare that it is impossible not to see a horse in them. A similar phenomenon affects the cultural heritage sites which we have discussed in this chapter. When we report that we can see traces of how they were in the past, this is an insight into "we did not know we knew". "We can recognise it without knowing it" (Kentridge, 2014, p. 20). According to Kentridge, seeing contains in itself the need to know, or to find meaning, and throughout this process of inquiry, drawing and narrative can become the "membrane through which we enter into contact with the world. [...] The sheet of paper is simply a visible extension of the retina, an emblematic demonstration of that which we know but cannot see. Our projection, our moving out toward the image, is an essential part of what it is to see, to be in the world with our eyes open" (Kentridge, 2014, p. 22). From this perspective we might say that drawing is a means of systematising primordial knowledge.

Fig.10.5 Young people learn what is their own landscape through the education of the eye, then through drawing. They walked around to explore and understand their heritage. Left: Karachi Chowk (PCCC, 2019). Right: Tremezzina (Como) Garden (source: Alessandra De Nicola, 2019)

"Only by seeing and seeing in abundance is it possible to develop refined taste and precise knowledge of the ways in which art may be applied to a given industry; memory initially and imagination later will be the richer for it and, together with imagination, our innate originality will come to light little by little". These are the words of the architect and restorer Camillo Boito addressed to student architects and engineers in relation to the importance of seeing (in Selvafolta, 1998, p. 65).

However, in more recent times the role of the gaze and its intellectual function has shifted to accommodate a more physical dimension. As we move beyond postmodernism, the body is gaining prominence and its newfound importance is beginning to be reflected in educational approaches to cultural heritage, as well as in certain participatory practices. Hence the proliferation of opportunities for exploration and walking as a cultural practice, because "walking is a state in which the mind, the body, and the world are aligned, as though they were three characters finally in conversation together, three notes suddenly making a chord." (Solnit, p. 10). This new harmony means that lived space is acquiring new prominence vis-à-vis the mathematical space of maps. In the words of Gilles Tiberghien "walking has always generated architecture and landscape and this practice, all but totally forgotten by architects themselves, has been reactivated by poets, philosophers and artists, capable of seeing precisely what is not there, in order to make something be there" (Careri, 2006, p. VIII). As Kentridge teaches us in his fourth

lesson on drawing, “walking is the prehistory of drawing” (ibid., p. 104).

Besides similar projects of learning by seeing, walking, talking the Pakistan Chowk Community Centre initiatives aimed also at a more structural approach to heritage advocacy. This is due to their awareness of the struggles of South Asian developing cities with preserving and valorising their rich heritage hampered by their fractured infrastructure. Here civil society intervention and local activism become a crucial part of heritage infrastructure preservation. The case studies engaged in working closely with the community when learning about the old town and its by now intangible heritage to incorporate this experience into grass root level change to develop and preserve and bring the past back as part of today’s conversation. This is an important intervention for the next generation. Research can shape the future of historic landscapes in cities by addressing the root causes of mismanagement that fail to preserve and protect the historic urban landscape and help emerging cities from further loss of their historic built environment. (Krishna, 2014). This is where research and citizen movement can act together and bring change through research and constant advocacy towards preservation.

All these new ways of resorting to seeing, sensing, drawing, narrating and walking to generate meaning have inspired the strategy shared by the Pakistani and Italian case studies, which drew on an artistic and therefore sensory approach, as a means of filling a “terrain vague”[5] with meaning. In response to the social need to be able to attribute meaning to local heritage assets, the creators of both projects sought to eliminate knowledge-related barriers to accessing heritage. In places that seemed empty because they had been emptied of meaning, they found ways of engaging the community to replenishing them with meaning. The aim in both countries was to raise awareness and support the community, so that its members would be empowered to become activists - that is to say, active subjects, sovereign citizens, and custodians of their own heritage. This goal was pursued via the practices of walking and drawing.

5 On this topic, see Ignasi de Solà-Morales, 1995, Urbanité Intersticielle, *Inter* Issue 61, Hiver 1995, p. 27–28

References

Berger J., 2005. *Berger on Drawing*, Cork: Occasional Press

Careri F., 2006. *Walkscapes. Camminare come pratica estetica*, Torino: Giulio Einaudi editore.

D'Angelo P., 2014. *Filosofia del paesaggio*, Macerata: Quodlibet.

De Nicola A., 2019. *Passeggiare, errare o vagheggiare per conoscere*, Cinisello Balsamo (Mi): Silvana Editoriale.

De Nicola A., Zuccoli F., (eds.) 2016. P*aesaggi culturali… Nuove forme di valorizzazione del patrimonio: dalla ricerca all'azione condivisa*, Santarcangelo di Romagna: Maggioli.

Kentridge W., 2014. *Six Drawing Lessons*, Cambridge: Harvard University Press.

Krishna, A., 2014. The urban heritage management paradigm: Challenges from Lucknow, an emerging Indian city. Cornell University, ProQuest Dissertations Publishing, 2014. 3579104

Mehrotra R., Narain Lambah, A., 2004. Conservation After Legislation. Issues for Mumbai. Mumbai: Urban Design Research Institute

Mirzoeff N., 2015. *How to see the world.* Penguin, London.

Mitchell W.T.J., 2018. *Image science: Iconology, Visual Culture, and Media Aestetic*s, Chicago: University of Chigago.

Pollack M., 2016. *Paesaggi contaminati,* Rovereto (Tn): Keller editore.

Rousseau JJ., 1976. *Le confessioni,* Milano: Garzanti.

Rousseau JJ., 1996. *Emilio o dell'educazione*, Volume 1, Milano: Fabbri editori. trad. it. a cura di E.Nardi.

Selvafolta O., 1998. *L'arte operosa. Nascita e sviluppo delle scuole per l'insegnamento artistico industriale*, in Selvafolta O.,*Cento anni. Scuola d'arte applicata Andrea Fantoni,* Bergamo.

Solnit R., 2014. *Wanderlust: A history of Walking,* London: Granta Books.

Zuccoli, F., De Nicola, A., 2018. *The district as a heritage asset to be explored. Pathways to discovery and appropriation in Bicocca.* Berlin: Springer.

About the editors

Judith Ryser jryser@dircon.co.uk

Qualified architect and urbanist with a social sciences MSc, Judith's cosmopolitan professional life in London, Paris, Berlin, Geneva (United Nations), Stockholm and Madrid is focusing on built environment sustainability and researching, reviewing, writing on cities in the knowledge society. She is a life member of ISOCARP (International Society of City and Regional Planners), ex-Vice President, General Rapporteur of the 50th anniversary congress 2015, editor and writer of several publications (e.g. "ISOCARP, 50 Years of Knowledge Creation and Sharing"; with Teresa Franchini 5th & 6th editions of the International Manual of Planning Practice) and member of the Chartered Institute of Journalist. She is senior advisor to Fundacion Metropoli, author and editor of many books and participant in urban projects; senior adviser, book co-editor and co-reviewer of Silk Cities; co-editor and coordinator of CORP (International Conference on Urban Planning and Regional Development in the Information Society); editorial board member, reviewer and topic editor of the Urban Design Group and has written and edited numerous books and articles. She taught at University College London and other universities, is on various scientific committees and mentoring mature students and young planners.

Fatemeh Farnaz Arefian f.arefian@silkcities.org

Farnaz is an experienced interdisciplinary expert in disaster management and reconstruction, urban design and planning, and architecture. Her professional life combines extensive experience in academic research and education with practice-based experience, knowledge exchange and engagement in the Middle East, UK, and Southeast Asia. Farnaz is the founding director of Silk Cities initiative, concerning urban challenges in countries along the historic Silk Roads with a focus on the Middle East and Central Asia (silk-cities.org). She has delivered largescale urban development and architectural projects, including various post-earthquake reconstruction projects in the historic city of Bam, e.g. participatory housing reconstruction and post-disaster urban design projects. Those first-hand encounter with urban development challenges and disasters, in the context of historic cities motivated her to return to academia and pursue her multidisciplinary Ph.D. research and further academic activities at the Bartlett Development Planning Unit (DPU), University College London (UCL), where she is also associated with. Her post-disaster reconstruction experience was featured in a guidance for humanitarian organisations. Farnaz is an invited speaker for international conferences and workshops. She published papers and books, including Persian Paradises at Peril (2021), Urban Heritage Along the Silk Roads (2019), Organising Post-Disaster Reconstruction Processes (2018), and Urban Change in Iran (2016).

List of contributors

In alphabetical order

Patricia Alarcón-Chaires, University of Michoacán, Laboratorio de Modelos Estructurales y Ensayes Sísmicos Faculty of Civil Engineering. Ciudad Universitaria, Mexico

Fatemeh Farnaz Arefian, Silk Cities, The Bartlett Development Planning Unit (DPU), UCL, UK

Lucia Barchetta, University of Camerino, Italy

Paolo Belardi, University of Perugia, Department of Civil and Environmental Engineering, Italy

Mario Benhumea-León, Seismocontrol, S.A. de C.V., Mexico

Alessandra De Nicola, University of Milano-Bicocca, Department of Human Sciences and Education, University of Milano-Bicocca, Italy

M. Cristina García-Nieto, Universidad Politécnica de Cartagena (UPCT), Mining and Civil Engineering Department, 30203, Spain

Francesco Giancola, University of L'Aquila, Department of Civil, Construction-Architectural and Environmental Engineering (DICEAA), Italy

Jamal S. Hashemi, University of Kashan, Iran

Hamidreza Jayhani, University of Kashan, Iran

Diana Lapucci, University of Camerino, Italy

Piero Magri, Terre di Mezzo, publishing house and organiser of *Fa' la cosa giusta!,* Italy

Marco Marino, Iuav University of Venice, Italy

Moreno Marziani, M&G Engineering s.r.l, Italy

Marvi Mazhar, Goldsmith University of London, Pakistan Chowk Community Centre (PCCC), Pakistan

Chiara L. M. Occelli, Polytechnic of Turin, Italy

Riccardo Palma, Polytechnic of Turin, Italy

Enrica Petrucci, University of Camerino, Italy

Mehrnaz Rajabi, Politecnico di Milano, Italy

Giovanna Ramaccini, University of Perugia, Department of Civil and Environmental Engineering, Italy

Judith Ryser, ISOCARP, Senior Advisor Fundacion Metropoli, Silk Cities, UK

Irene Ruiz Bazán, Polytechnic of Turin, Italy

Parichehr Shafie, University of Kashan, Iran

Franca Zuccoli, University of Milano-Bicocca, Department of Human Sciences and Education, Italy

Index

The page numbers are hyperlinks.

A

B

C

D

E

G

H

I

K

L

M

N

P

R

S

T

U

V

Z

Post-disaster reconstruction, disaster management, risk reduction and urban resilience form important themes of Silk Cities activities as the initial geographic focus of Silk Cities is the Middle East and Central Asia which during recent decades have suffered a variety of destructive incidents, ranging from natural hazards to conflicts and wars...

-Preface, IV

Silk Cities is an independent professional and academic initiative for knowledge exchange, research, engagement and raising awareness on under-explored contextual and global challenges and opportunities. Its initial geographic focus was on those countries along the Silk Roads in the Middle East and Central Asia. This region is the home of long lasting urbanism and civilisations, therefore enjoys rich tangible and intangible heritage built over millenniums and centuries of history. However, the region also suffers from contextual and global challenges affecting societies and cities. Additionally, it has suffered from a variety of destructive incidents especially in recent decades, ranging from natural hazards to human induced origins, from earthquakes to wars.

Fostering international dialogue and knowledge sharing, the geographic coverage of Silk Cities reaches out further to other cities, regions and countries which are prone to similar issues and global challenges.