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# Urban Planning and Architectural Design for Sustainable Development

Proceedings of Urban Planning and Architectural Design for Sustainable Development (UPADSD) – 6th Edition 2021

## Preface

As many countries around the globe continue their struggle with the Covid-19 pandemic, the world can now see how a single occurrence could tip the scales and influence almost every aspect of our lives, leaving a mark on our cities that will echo for generations. Early research on its effects in cities mainly concerns four themes including environmental quality, socio-economic impacts, transportation, and urban design as well as management and governance, all of which provide planners, practitioners, and policymakers with the best opportunity to contribute to creating more resilient and sustainable cities.

That being said, with this challenge comes a positive secondary impact as it sparks debate, the introduction of innovative solutions, and an improved response to current and future crises. Therefore, it has become vital that new approaches to city planning are introduced to achieve a more resilient and sustainable use of public spaces in the future.

One of the key measures in combating Covid-19 in the past was a complete restriction on the use of public spaces. So how will we adjust to this new normal, and what will happen to those spaces? Questions like these and many others arose in the span of only two years that made us rethink our relationship with public spaces and our environment. A new holistic approach to city planning should be the center of focus in support of climate mitigation, better health, better water and waste management, a more resilient and inclusive Circular Economy, and an effective urban service provision.

This book is a collection of innovative research submitted to the 6th edition of the International Conference on Urban Planning & Architectural Design for Sustainable Development, as well as the 1st edition of the Circular Economy for Sustainable Development. It provides a brief glimpse into the measures that need to be taken to achieve sustainable urban planning and development in a post-COVID world as well as preserve and manage our cultural heritage, improve energy efficiency in buildings, and address issues of urban infrastructure.

Over the past two years, urban vulnerabilities and underlying patterns and effects of the pandemic have been the focus of research published. In this abstracts book, we showcase valuable insights of researchers across the globe who introduce urban models for a post-COVID future, investigate user behaviors towards public building designs and public transport systems and contribute to the development of pandemic-resilient urban development.

## **Acknowledgements**

IEREK would like to express its appreciation to all the members of the staff, scientific committee, chairpersons, and editors for contributing to the tremendous growth of this institution and for making the 6th edition of the International conference on Urban Planning and Architectural Design for Sustainable Development and the 1st Edition of the Circular Economy for Sustainable Development International conferences a success.

IEREK would also like to thank the conference chairpersons, Professor Francesco Alberti and Professor Fabio Pollice, who are the core reason as to why this conference was transformed from a mere vision into real life success. This institution is greatly indebted to IEREK's advisor and Italian Alliance Director, Prof. Ferdinando Trapani. IEREK takes distinct pride in being an institution that amasses a highly qualified and competent team who restlessly worked for months to make this conference what it is today. As for the success of this conference, any step forward towards the ultimate goal of creating a well-rounded society was made possible by the highly reputable scientific committee that worked competently to prepare for and revise research papers. It would also like to give thanks to all the members of the Scientific Committee who made it their duty to help this institution spread knowledge to the masses.

## WORD BY THE CONFERENCE CHAIRPERSON

For the second year in a row, IEREK Conference on Urban Planning and Architectural Design for Sustainable Development, organized with the scientific support of the Department of Architecture of the University of Florence, has migrated onto the web because of the Covid-19 pandemic.

A big debate has arisen worldwide on what will be the long-time consequences of this dramatic experience, which, differently from the last edition of the Conference, is often mentioned by the authors of the submitted papers as the current state of affairs.

It is a widespread opinion that when we will have left the sanitary emergency behind, never will be the same. So, the question is: will we be better off?

The only possible answer is: it just depends on us, as well as for all other emergencies about the planet's and its inhabitants' health and survival that have been temporarily obscured by the pandemic: global warming, pollution, soil consumption and depletion, exploitation of natural resources above their thresholds for reproduction, reduction of biodiversity. Without forgetting that such environmental emergencies go hand in hand with the social and economic sustainability ones called into question by the seventeen SDGs of the United Nation Agenda 2030.

It just depends on us - where "us" stands both for members of the human race and specifically for researchers, professionals and educators in the fields concerning the human habitat: urban planner and designers, architects, engineers, landscape designer, agronomists, etc.

The papers presented at this edition of the UPADSD Conference are a significant testament to how disciplinary research is already able to provide advanced analysis tools and innovative design approaches to address the challenges we face.

The hope is therefore that the Covid-19 pandemic can be soon left behind and remembered as a painful but decisive turning point in the collective awareness and assumption of responsibility, so that research lines and concepts such as those presented in this anthology can germinate and grow worldwide.



**Professor Francesco Alberti**

Professor at the Department of Architecture (DiDA),  
University of Florence, Florence Italy.

## **Word from the Chairman of the Board of IEREK**

First, I would like to state that it is my honor to be launching this joint conference on the vital themes of Urban Planning for Architectural Design and Sustainable Development (UPADSD) 6th edition and Circular Economy for Sustainable Development (CESD) 1st edition of its kind.

Second, I would like to praise IEREK's efforts in establishing this successful event. IEREK- International Experts for Research Enrichment and Knowledge Exchange - is an institution that began pursuing its goal of reaching excellence in the research field in 2013, and since then has been linking scholars from around the world and providing them with a platform that would advance all their innovative efforts. All the while achieving IEREK's main goal of building international relationships with prestigious universities and institutes worldwide, spreading knowledge, and enhancing research around the world, through collaborating with trustworthy partners who share its same vision.

With this undertaking, IEREK hopes to present the world with a conference that positively contributes to its field and paves the way for scholars to combine their ideas for the greater purpose of discovering new and innovative solutions to today's issues, along with the aid of our scientific committee of distinguished professors and researchers from a range of established universities from around the globe.

Finally, I hope that the conference succeeds in delivering its message to the world of professionals in the various concerned disciplines to inspire that their work be made a reality. I also welcome all audiences, from undergraduate to postgraduate students, and all who could benefit the most from this conference. I look forward to seeing you all and to collaborating on this prosperous experience.



**Mourad S. Amer**

Architect, B5c, DSc, MSc, PhD

IEREK CEO



## Table of Contents

### Part I: Past and Future: City's Image and Preservation

1	A Study of Urban Size Control in the Japanese Understanding of Garden Cities in the Early 1900s <b>Junko Sanada</b>	3
2	Cultural Heritage Management and Sustainable Tourism in Historical Cities (Case study: Durrat Al Nil Park, Station square and the old tourist market in the historical Aswan City – Egypt) <b>Ahmed Awaad Gomaa Awaad</b>	5
3	New planning tools from emergencies <b>Ludovica Gregori</b>	8
4	Urban planning & cultural landscapes preservation facing coastal sprawl: A case study of Annaba coast, Algeria <b>Laouar Imene</b>	10
5	Restructuring the Public Transportation of Hubballi Dharwad by Bus Rapid Transit System <b>Kalpeshkumar Patel</b>	12
6	Research and application of climate-responsive design of traditional vernacular houses in Chaoshan, China <b>Jinglei Li, Zhaoji Wu, Yufeng Zhang</b>	14
7	Understanding Place Attachment Process Through Instagram Narratives and Imagery of Historic Urban Places <b>Tugce Ertan Meric, Norsidah Ujang, Jamie MacKee</b>	16
8	Design for deconstruction and reuse: towards a circular industrialized housing design <b>Lisco Margherita, Martinez Carlos, Persson Urban</b>	19
9	Future study of regional spatial structure in Iran (Horizon 2040) <b>Haniyeh asadzadeh, Afshar Hatami</b>	22
10	Pre Preserving the margins: pre-colonial cultures in peripheral areas of a city in the Andes, an example to learn from <b>Lizeth Marcela Lozano Huera, Michael Maks Davis</b>	25
11	Public Parks for Post Pandamic Landscape Architecture <b>Ebtesam Mohamed Elgizawy</b>	30
12	THE NATURE SMART CITY II – Defining the Next Urban Vision <b>Anne Stenros</b>	32
13	ISTANBUL ; THE ECOLOGY, NATURE AND DISASTERS; DESIGNING FUTURE CITY WITH INNOVATIVE HOUSING PROJECTS <b>Hülya Coskun</b>	35

### Part II City Planning: Urbanization and Development

14	Sustainable urban development: Bioregionalistic vision for small towns <b>Surekha K C</b>	41
----	--	----

<b>15</b>	Carbon neutral district project for regenerating a suburban area within the Reinventing Cities C40 framework <b>Lavinia Chiara Tagliabue, Jacopo Muzio Treccani, Antonio Della Bella</b>	<b>45</b>
<b>16</b>	Investigation of pedestrian life and urban traffic situation with emphasis on human-centered transportation (walking and biking) for a low income group of employees <b>Sayed Nasir Shah, Yoshitaka Kajita</b>	<b>47</b>
<b>17</b>	Climate-proof planning for an urban regeneration strategy and territorial rebalancing <b>Carmela Mariano</b>	<b>49</b>
<b>18</b>	The Power of Long-Term Residents in Consensus Building for Reconstruction of the Housing Complex Area: Case study on Tama City, Tokyo <b>Yuno Tanaka</b>	<b>51</b>
<b>19</b>	New paradigms for city management and planning. From Open Data Knowledge Sharing Platforms to e-partecipation in Italy <b>Elisa Cacciaguerra, Barbara Chiarelli</b>	<b>54</b>
<b>20</b>	Towards adaptive planning of urban spaces in the context of a new agile urbanism <b>Edith Schwimmer, Claudius Schaufler</b>	<b>56</b>
<b>21</b>	The need to Adapt and change the Old Planned Areas of Indian cities with Future needs of the City <b>Rudrasen Sheorey, Soham Moharir, Suresh Bhalsingh</b>	<b>58</b>
<b>22</b>	Compactness as a Condition, Compaction as an Ambition - Potentials and Pitfalls of an Interdisciplinary Global Debate on the Compact City <b>Henry Endemann, Gerhard Bruyns, Joern Buehring</b>	<b>61</b>
<b>23</b>	From the Neighborhood Unit to the 15-Minute City. Past and Recent Urban Models for the Post-Covid Future <b>Francesco Alberti, Antonella Radicchi</b>	<b>63</b>
<b>24</b>	Mapping Social Cohesion and Identity in Intercultural Public Spaces <b>Chitsanzo Isaac, Olaitan Awomolo</b>	<b>65</b>
<b>25</b>	City-effect: new centralities in post-pandemic regional metropolis Pescara-Chieti <b>Antonio Bocca</b>	<b>68</b>
<b>26</b>	Transit Oriented Development (TOD) vs. Capability Approaches vs. Sumak Kawsay: conceptual steps toward the decolonisation of transport knowledge <b>Michael Maks Davis</b>	<b>71</b>

### **Part III: Circular Economy: A Sustainable Solution for a Sustainable Future**

<b>27</b>	Design experimentations for built environment's care <b>Maria De Santis, Ludovica Gregori</b>	<b>77</b>
<b>28</b>	THE CIRCULAR ECONOMY INNOVATION POTENTIAL BEHIND THE SCARCITY OF RAW MATERIALS - A LITERATURE REVIEW <b>Elisabeth Kraut, Wanja Wellbrock, Wolfgang Gerstlberger</b>	<b>79</b>

29	Barriers and Enablers to a Circular Economy Transition in Small Island Destinations: The Case of the Orkney Islands <b>Angelo Sciacca</b>	82
30	Development of new bio-based materials derived from Sicilian agri-food industry waste <b>Simona Colajanni, Tiziana Campisi, Marco Bellomo, Alfonso Senatore</b>	84
31	Human sphere' and the Figure of 8 as the Enabler of Circular Economy in Developing Countries: A Case Study <b>Michael Maks Davis, Andrea Vallejo, Paulina Criollo, Teresa Domenec</b>	86
32	Nature Based Solutions: lessons learnt from 3 case studies spanning cocoa production with forest landscape restoration, mangrove restoration and the fishing industry in marine systems <b>Lizeth Lozano, Michael Maks Davis</b>	89

#### **Part IV: Reimagining Cities, Territories and Landscapes**

33	Turning urban streets from infrastructures to living places. Early research outcomes of a case study in Prato, Tuscany <b>Gabriele Paolinelli, Lorenza Fortuna</b>	95
34	The potential of multi-located work for research: From Covid-working to distributed university campus <b>Alessandra Migliore, Chiara Tagliaro, Andrea Ciaramella</b>	98
35	City, public space, architecture. Looking for community <b>Martina D'Alessandro</b>	101
36	Rethinking urban habitat: the green challenge in planning experimentation for building reuse in the city of Prato <b>Maria De Santis, Antonella Trombadore, Valerio Barberis</b>	103
37	The Ontology of Landscape Architecture; Design thinking and semantic networks <b>Azadeh Rasouli Yazdi, Niloofar Razavi</b>	105
38	Liveable urban open spaces for health and wellbeing. Towards the Careggi Campus landscape masterplan for the Florence University Hospital <b>Gabriele Paolinelli, Nicoletta Cristiani, Giacomo Dallatorre, Lorenza Fortuna, Claudia Mezzapesa, Lorenzo Nofroni</b>	107
39	Artificial wetlands as a key for the construction of new sustainable urban systems <b>Giovany Albarracin, Christian Contreras, Angel Puga</b>	111
40	The transfer of territorial mosaic principles to manage the peri urban landscape of Lille, France, The case study of the la Deûle Park <b>Maria Carolina Solar Silva</b>	114

#### **Part V Innovative approaches to Urban and Architectural Design towards Sustainability**

41	Solar City, Future City; Analysis Of Solar Radiation Towards Optimization And Location Of The Urban Blocks In The Neighborhood Units <b>Omid Veisi, Amir Shakibamanesh</b>	119
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42	Energy Efficiency and Building's Envelope: An Integrated Approach to High-Performance Architecture	122
	<b>Parinaz Mansourimajoumerd, Hassan Bazazzadeh, Mohammadjavad Mahdavinejad, Sepideh Nik Nia</b>	
43	Evolution of Users Behavior Towards Designing Public Buildings in The Era of Covid-19, Alexandria New Restaurants Design Case Study	124
	<b>Nourhane M. El-Haridi</b>	
44	Analysis of the development prospect and application of smart streetlamps in Macau based on the background of smart city	126
	<b>Yile Chen, Liang Zheng</b>	
45	Predicting Performance Measurement of Residential Buildings Using Machine Learning Algorithm	129
	<b>Salah J. Mohammeda, Hesham A. Abdel-khaleka, Sherif M. Hafez</b>	
46	Urban regeneration through Climate Adaptive Design for the Mediterranean area	132
	<b>Paola Gallo, Antonia Sore, Alessandra Donato, Rosa Romano</b>	
47	A vision towards development: interpreting the architectural heritage of Sinincay (Cuenca, Ecuador)	135
	<b>Amanda Paulina García Cordero, Maria del Cisne Aguirre Ullauri</b>	

**Part I**  
**Past and Future: City's Image and  
Preservation**

# New planning tools from emergencies

Ludovica Gregori

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## Abstract

Natural disasters cause traumas, thus social breakdowns. Living in post-emergency settlements is an opportunity for community recovery. This potential is identified here in open space, a constant element regardless of the adopted housing systems and catastrophe. Open space guidelines for temporary settlements are proposed as resilient tools for sociality. The further development foresees to translate the guidelines in spatial parameters to be used in widespread BIM planning software and become design tools for different social contexts.

## Keywords

*Emergency; urban sociology; open space; community resilience; spatial parameters; BIM.*

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## 1. Community-focussed urban answers for traumatic experiences

Natural or man-made emergencies clearly connect social and psychological difficulties to architecture: the loss of the built environment follows that of the identity of the place, which made up the social geography (Calandra et al., 2016) of the inhabitants. Architecture, specifically open space design, can be a healing tool in trauma recovery after a disaster. Open space is the connective tissue of urban systems, bearer of identity and collective life. It compensates for personal difficulties by promoting community strength. Thanks to its better transformation's capacity than the built environment's one, open space design strategies can become resilient tools for sociality. The study of fragile post-emergency settlements, including temporary ones, provides new inputs to create time-sensitive resilient urban answers to foster social liveliness in every situation.

The Master Thesis "Social reconstruction in post-seismic emergency" investigated the role of Architecture in the post-earthquake scenario in the Italian "inner areas" ("aree interne") and it is the base for a further development currently carried out through a PhD program at the Architecture Department of the University of Florence (2020-2023). The importance of this topic can be summarized in the fact that by underestimating the social rehabilitation after a disaster there is a risk of rebuild places for communities that do not exist anymore due to the individual fragility of their members. These events shatter mental health assumptions formed in the context of community life; since trauma leads to social de-bounding, trauma recovery involves community reconstruction (Gordon, 2004). Projects, even temporary ones, are considered necessary to foster social unity and community resilience (Mela, 2017) and the post-emergency phase appeared to be the most delicate time as it sits between the loss of social geography and the creation of a new one. Community recovery, «the material and immaterial reconstitution of the community» (Mela, 2017) starts here. Thus, this research developed design tools for open spaces in post-disaster settlements to facilitate social interactions to support trauma healing.

## Final considerations

This work aims to support authorities that need simple and tested tools in response to the emergency. These user-friendly guidelines can be used by administrations and designers and understood by the citizens themselves; thus, all stakeholders are equal actors in the dialogue for a participatory design (Berni, 2015).

The theme of this research revolves around the role of architecture in people's lives after a natural disaster. Architecture can have an active role in trauma recovery after a disaster: if the new built environment promotes social interaction between the members of the community, it could be a healing tool or, on the other hand, it could prevent inclusion and foster isolation.

It was fundamental to define the phase in which architecture can be an efficient tool for trauma recovery. Theory studies on shock handling and the experiences of psychologists who supported the population of the case study showed that life in temporary housing is the best opportunity for the community to heal before reconstruction. Most

of their layouts are based on mere functionality. The design choices will have long-term repercussions on the inhabitants physical and psychological well-being. It could be less worthwhile to spend material and economic resources to reconstruct villages or cities for people that are adverse to each other and are not able to share their common condition due to their individual fragility which could lead them to even abandon the territory.

As in this research, social sustainability is more often considered on a par with or even preparatory to environmental and economic sustainability. To achieve this, Europe provides co-design and co-implementation in urban development and daily policy to ensure the well-being of citizens. In the 2030 Agenda for Sustainable Development programme the mentioned theme is central: disasters caused by climate change, unstable political or social conditions and natural or anthropic disasters, and the associated risks and resilience.

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