



# BOOK OF PROCEEDINGS

**INTERNATIONAL CONFERENCE**  
**13<sup>th</sup> - 14<sup>th</sup> October 2023**

ISSUES OF HOUSING,  
PLANNING, AND  
RESILIENT DEVELOPMENT OF  
THE TERRITORY

**Towards Euro-Mediterranean  
Perspectives**

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# **Issues of Housing, Planning, and Resilient Development of the Territory Towards Euro-Mediterranean Perspectives**

## **Conference Theme and Rationale**

Albania, along with other Western Balkan countries, has undergone significant economic, social, and political changes in recent years. As a result, housing, planning, and the resilient management of territorial development have emerged as critical issues. This is because these regions face significant challenges in providing affordable housing, addressing the impact of urbanization on the environment, fostering evidence-based decision-making on the territory, and bringing forth the commitments towards climate neutrality.

The organizers use the term “multi-modality” to define complex situations (in matters of territorial planning, management, architecture, housing, public space, technology, etc.) that have historically encompassed Western Balkans and Mediterranean cities in a logic of coexistence and value co-creation. A combination of knowledge and heritage that throughout time and history have given life to civilization in this region of Europe. The active involvement of Albania in the existing network of the Mediterranean Basin and the EU, through a joint action plan with UN / UNECE, and the Albanian and regional authorities, including reputable scientific bodies such as the Academy of Sciences of Albania, makes this conference even more intriguing to explore fascinating areas of research. The conclusions, to be considered as a stage for open innovation, will include recommendations for further scientific and applied research, projects, and events.

The geographical focus of the conference covers three dimensions: i) Albania; ii) the Western Balkans; iii) Euro-Mediterranean countries. POLIS University aims to focus on the above-mentioned research areas that are of common interest to both Western Balkans and Mediterranean cities, including, but not limited to: housing policies, urban history and architecture typology, innovation and digitalization in urbanism, energy efficiency, resilience and environmental sustainability, governance and smart technologies for city management, education and gender aspects in urban planning research.

In this regard the main aim of this international conference is to bring together scholars, policy-makers, and practitioners to examine the pressing issues of housing, planning, and land development in these regions, in a context of transition fatigue, climate challenges and post-pandemic realities.

# **Issues of Housing, Planning, and Resilient Development of the Territory Towards Euro-Mediterranean Perspectives**

## **Conference Aim**

The main aim of this international conference is to bring together researchers, policy makers and practitioners to examine the urgent issues of housing, planning and land development in these regions, in a context of transition, climate challenges and post-pandemic realities.

## **Objective**

- Consolidation of the cooperation network between Albanian and non-Albanian researchers, lecturers, managers, with the aim of participating in joint research projects at the regional and international level;
- Support of local authorities with contemporary data, on the state of housing issues, planning and sustainable urban and environmental management, as well as representatives of public and private institutions operating in this field.

The conference is organized by POLIS University (U\_POLIS) in cooperation with the Academy of Science of Albania, and supported by other local and international partners.

In the framework of resilience, the main conference theme is devoted to Issues of Housing, Planning, and Resilient Development of the Territory from a Euro-Mediterranean Perspective, including Albania, Western Balkans and the Mediterranean Basin. This event aims to bring together academics, policymakers, researchers, experts, practitioners, and stakeholders from diverse backgrounds to discuss and address critical challenges related to housing, urban planning, and the development of resilient territories.

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# **Disaster Risk Reduction within Complex Urban Systems. The importance and challenges of holistic approaches**

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## **Abstract**

In the dynamic realm of urban systems, it is well known that natural disasters impose great challenges that hinder the sustainable development of such systems. The initial approaches towards cities and their sustainable development had the tendency of a fragmentary analysis. Thus, urban elements of different scales were seen separately without carefully considering the interdependency. Modern approaches tend to analyze such systems as a whole, complex unit in which every constituting element in different scales is analysed in relationship to other elements as part of a greater system. Nevertheless, disasters seem to be on rise worldwide (Gaillard and Mercer, 2012) reflecting an inability to properly adapt to such hindering hazardous events. The aim of this paper is precisely to reflect on the importance of holistic approaches and the challenges such approaches impose from knowledge and implementation point of view taking into account the multiscale dynamics of cities. Through an analysis of the current state-of-the-art, the paper tries to give an overview on “knowledge” and “implementation” point of view in terms of Disaster Risk Reduction(DRR) and the complexity within Urban Systems.

## Keywords

Resilience, Disaster Risk Reduction, Complex Urban Systems, Holistic approach



## **Introduction**

Cities represent complex structures composed of several systems and subsystems organized in different ways. Due to the complex relationship and interdependencies between the elements of urban systems, the behaviour of such systems in the case of a possible natural hazard imposes a challenge. While fragmentary approaches are widely used by experts, there is still a lack of fully understanding how such elements being part of a single complex system would interact with one another during an external shock.

Disasters through the years have caused major disruptions which seems to be on rise worldwide (Gaillard and Mercer, 2012) even though there has been significant improvement in tools and specially data due to the digital era. One of the main reasons for the lack of efficiency in properly tackling issues related to natural disasters are exactly these fragmentary approaches that have failed to analyse cities as single complex units having interdependent elements in different levels from operational to local scale. The issue of scale represents a debate and the modelling of cities is accepted to sit naturally at the edge between a macro and micro analysis (Galloti, Sacco and Domenico, 2021). In addition, the urban problems involve a myriad of aspects; social, economic, physical and environmental. Working with these diverse elements represents a challenge that is not only related to the scale, but also to the way such components are related to one another imposing therefore a multi-disciplinary approach.

Due to the aforementioned issues in the last 20 years the notions of urban resilience, resilient cities and disaster risk reduction have raised a great interest from the research point of view. Thus, the aim of this paper is to analyse and give an overview on the approaches towards such concepts and the importance of aiming towards holistic approaches rather than fragmentary analyses.

## **Urban System Resilience**

### **Urban Resilience**

Both, natural and man-made hazards are among predominant factors that shape the cities and impose a necessity to adapt and be able to response in effective manner towards such distresses. When dealing with hazardous events and their potentiality of leading to a disaster there is the need to deal with many concepts; some of them being abstract and used interchangeably leading to confusion among researchers and practitioners. Among this concept is resilience, which derives from Latin and it simply means “to bounce back” or represents the ability to recover from some shock, insult or disturbance (Cimellaro, 2016). The term is actually widely used from different point of views; social, ecological or physical.

When talking about resilient cities a combination of the concepts from the engineering perspective and socio-ecological perspective is needed as cities represent sustainable network comprised of physical elements and human communities which need to be capable of managing extreme events (Rus, Kilar and Koren, 2018). In a definition by (Bozza et al., 2017) an urban system consists of non-homogeneous components that interact and coexist to withstand an external stress and to bounce back to an equilibrium state or bounce further to an improved condition.

Urban resilience is characterized by a scale dimension and more importantly by a time dimension; therefore, it is analysed before the shocking event, at the time of the shocking event and after such event. Within this time dimension it is important to emphasize how resilience itself is related to risk. To better understand this relationship, the resilience curve by (Cimellaro, 2016) can be used. As a time-dependent function, resilience is dependent of risk, which on the other hand represents the potential degree of losses (economic, physical, social, cultural, environmental) due to a combination of the conditions of a system with the probability of occurrence of an event. In simple

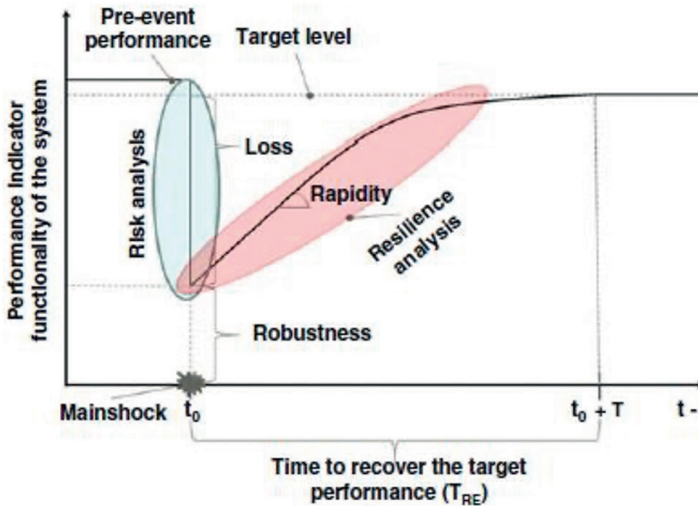


Figure 1: Risk and resilience analysis / Source: Cimellaro, 2016

terms, the level of risk would characterize the impact a main shock might have on the selected performance level of an urban system and directly on the rapidity levels, or the time needed to regain such pre-event performance level.

### Disaster Risk Reduction and Urban Risk

When talking about resilient urban systems it is of extreme importance to understand how such target is part of what is widely known as Disaster Risk Reduction, which as defined by UNISDR represents the concept and practice of preventing new or reducing existing disaster risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.

The same as resilience, risk should be assessed at a range of scales and tackle all relevant complexities that arise from factors as; multiple hazards, multiple sectors that are at risk, multiple assets and multiple stakeholders. In order to properly evaluate urban risk within the aim of urban resilience it is important to take into account the dynamic character of the cities. Based on such aim (Dickson et al., 2009) proposed a flexible approach that facilitates improved understanding of a city's risk known as URA (Urban Risk Assessment).

Such risk assessment is based upon three main pillars; institutional, hazard impact and socio-economic each one of them associated with three levels of complexity as shown in Figure 2.

(Palliyaguru et al., 2014) tried to establish a holistic approach to DRR by emphasizing its importance for the vulnerability reduction since such understanding would enable decisions to be made on which Disaster Risk Reduction strategies could address triggering agents, functional areas, actors etc. In this context the DRR strategies are categorized in such way as to overcome several factors that generate vulnerabilities. Such strategies include: Policy and planning strategies, physical strategies, emergency preparedness strategies, natural protection strategies and knowledge management strategies.

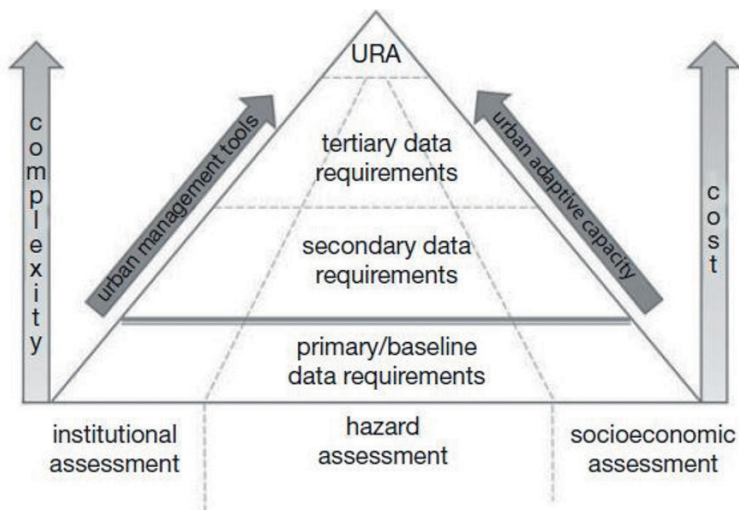


Figure 2: Urban Risk Assessment Approach (Dickson et al., 2009)

|               |            | On  |  |   |
|---------------|------------|---|--|---|
|               |            | Civil Life  | Industry   | Lifeline  |
| Dependency of | Civil Life | <b>① Within civil life</b><br>· means-ends dependency<br>· resource-sharing/conflict<br>· geographical dependency       | <b>② Civil life on industry</b><br>· dependency on supply<br>· geographical dependency   | <b>③ Civil life on lifelines</b><br>· dependency on supply<br>· geographical dependency                               |
|               | Industry   | <b>④ Industry on civil life</b><br>· dependency on demand<br>· dependency on labor supply<br>· geographical dependency  | <b>⑤ Between industries</b><br>· demand-supply/means-ends dependency<br>· alternative/competitive<br>· geographical dependency | <b>⑥ Industry on lifelines</b><br>· dependency on supply<br>· geographical dependency                                 |
|               | Lifeline   | <b>⑦ Lifelines on civil life</b><br>· dependency on demand<br>· dependency on labor supply<br>· geographical dependency | <b>⑧ Lifelines on industry</b><br>· dependency on supply/demand<br>· repair dependency<br>· geographical dependency            | <b>⑨ Between lifelines</b><br>· dependency on supply/demand<br>· alternative/competitive<br>· geographical dependency |

Table 1: Categorization of multiple interdependencies between subsystems (Kanno et al., 2018)

### Urban System Interdependencies

As aforementioned cities represent complex system composed of several elements physical and social which have a dynamic interaction. Several studies have tried to quantify and analyse such interaction and interdependencies and most of them are focused on physical elements only. For

instance, (Huang et al., 2014) proposed a method for exploring the interdependencies and interactions of critical structures which are defined as physical and logical systems with major importance for public welfare. Such structures are considered that interact at different levels and different scales and a failure in any type of such infrastructure would have an impact on the proper functionality of the others.

Through a detailed literature review (McClymont et al., 2022) emphasized the relationship between resilience and complex system thinking where resilience is not only about resisting change and conserving, but also about adaptability through the recognition of the interplay between fast changes and longer-term sources, acknowledging therefore a cross-scale interaction. In order to explore interactions across different spatial and temporal scales the concept of hierarchy is very important, where each element should also be understood as a nested whole that requires identifying which scale analysis is needed within that hierarchy, whilst keeping in mind the wider context. Another attempt to model urban systems and emphasize the interdependencies is proposed by (Kanno et al., 2018) in which three major subsystems are considered: civil life, various industrial companies, and physical lifeline infrastructures. Such modeling framework is human-centered as human life and its activities are the most important part of the society and its important to consider such activities and enhance the functionality. The categorization of the dependency between the major subsystems is given in Table 1:

### **Urban Scale Seismic Risk Assessment**

Based on the objectives and principles posed by the SENDAI Framework for Disaster Risk Reduction, with a specific focus on seismic events as they represent one of the most severe forms of natural disasters due to the unpredictable nature focusing on the topics of holistic approaches, multi-scale and resilience objectives (Duro, 2023) proposed a methodology for the integration of seismic risk assessment within an urban context. The methodology aimed to bridge what is often referred by (Gaillard and Mercer, 2012) as a gap between knowledge and implementation in DRR by focusing on the issues of multi-scale and multi-disciplinary. It is based on the Analytical Hierarchy Process (Saaty, 1980) and on Spatial Multi-Criteria Evaluation (SMCE).

The first step consisted on the definition of relevant indicators that would be used to characterize elements of hazard, vulnerability and exposure of a built system to a seismic hazard. A total of 14 indicators are selected based on the criteria of complexity, information and importance and organized in 5 levels of hierarchy. The indicators are used to characterize information at an operational (building) scale, but also at a local scale. For instance, building density, street network configuration, open spaces accessibility are selected among the indicators. As such methodology is focused on decision-making the need for a common language to communicate such information among different stakeholders required the definition of standardized values for each of the selected indicators. The process of switching from a variable of a certain nature to unified variables is defined as standardization process and is done by the means of value functions which are mathematical representation of human judgements (Beinat, 2012).

On the other hand, to specify the relationship between variables in different levels and their importance in the final value of risk (at a local urban scale) pairwise comparison matrices are used based on the AHP.

Finally, the produced information is aggregated by the means of the weighted linear combination (Malczewski, 2000).

| Intensity of importance | Definition                             | Explanation   |
|-------------------------|--|---|
| 1                       | Equal Importance                       | Two activities contribute equally to the objective  |
| 2                       | Weak or Slight                         |   |
| 3                       | Moderate Importance                    | Experience and judgement slightly favor one activity over another                               |
| 4                       | Moderate plus                          |   |
| 5                       | Strong Importance                      | Experience and judgement strongly favor one activity over another                               |
| 6                       | Strong Plus                            |   |
| 7                       | Very strong or demonstrated importance | An activity is favored very strongly over another; its dominance demonstrated in practice       |
| 8                       | Very, very strong                      |   |
| 9                       | Extreme Importance                     | The evidence favoring one activity over another is of the highest possible order of affirmation |

Table 3: The scale of relative importance (Saaty, 2008)

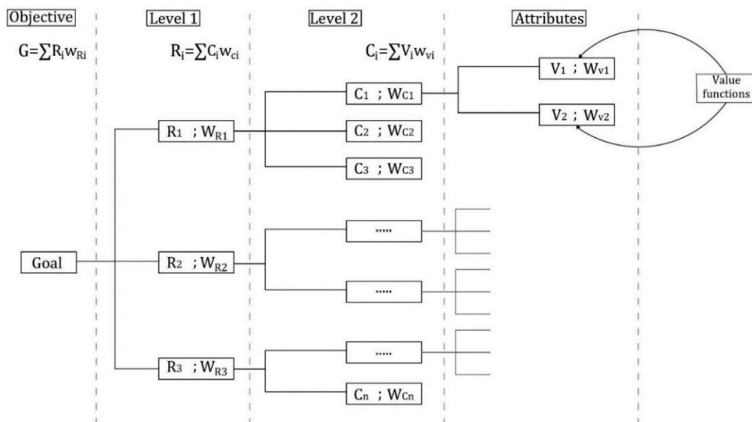


Figure 3: Simplified scheme of the aggregation process (Duro, 2023)

The results of such methodology are believed to foster top-down and bottom-up approach because the data collection and elaboration is context specific giving an output to local and national authorities, while on the other hand such approaches require an understanding of the event at a regional and national scale, implying the need for coordination and information in these levels. In addition it imposes a vast majority of stakeholders. On one hand there is the local community, which is directly affected from such events and on the other hand there are local and national institutions. In addition, social and physical scientists are the other important actors. The proposed

methodology for risk evaluation represents a tool which can be easily adapted and improved by these scientists by adding the necessary information and variables and re-interpreting the hierarchy system. The scientists and specialists in collaboration with local institutions can foster the adaptive capacities of the local community since the results can be translated in interventions like prioritization, evacuation routes, faster responses and better dissemination of information. The facility in such communication process would enhance the resilience of the entire urban system as it would impact in the effectiveness of transmitting such information and therefore improve preparedness level of such complex systems.

## Conclusions

This paper aimed to give an overview on one of the most important and debated topic as that of urban resilience and disaster risk reduction. From the resilience point of view there is clearly a dependency on time scale and spatial scale therefore it is important to focus on dynamic frameworks and methodologies that precisely aim to target such variability. By doing so, there is the need to also take into consideration that urban systems need to be analyzed as a whole unit composed by several components that interact and are dependent on one another rather than analyzed as a mix of fragments in which elements are seen independent. Such approaches certainly affect the complexity of the problem, but would enhance the resilience level of urban systems towards external shocks in short and long term.

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